

# SECTION 4: ENVIRONMENTAL CONSEQUENCES

This section describes the impacts that could result from implementation of the alternatives. Since the alternatives described in Section 2 of this document are presented in a general “brushstroke” manner, the analysis of environmental consequences also must be general. The NPS can only make reasonable projections of likely impacts. Thus, this environmental impact statement is programmatic and presents an overview of potential impacts relating to the alternatives. This environmental impact statement will serve as a basis for NEPA documents prepared to assess subsequent developments or management actions.

## PRIMARY DIFFERENCES IN IMPACTS BETWEEN ALTERNATIVES

The Preferred Alternative and Alternatives B-E share many common elements. The alternatives also have differences. Many of the differences between alternatives are a function of each alternative's primary focus. As previously explained, all action alternatives are intended to support the park's significance and purpose, achieve desired futures, avoid unacceptable resource impacts, and provide for public enjoyment of the preserve. Thus, natural resources, cultural resources, and visitor use are important considerations in all alternatives. However, the focus of each alternative helps determine how each of these concerns is managed relative to the other concerns.

Because the alternatives share many common elements, many impacts of the alternatives would be similar. The difference in the impacts created by each alternative is related to the difference in focus between alternatives; frequently this difference can be expressed only in terms of a level of intensity. That is, an impact on a resource may be similar among alternatives, but would be of slightly more or slightly less magnitude because of the emphasis an action or program would receive under a particular alternative.

This section briefly highlights some of the notable differences in impacts between alternatives. A complete discussion of the impacts of each alternative follows in subsequent sections.

Implementation of any of the action alternatives, including the preferred alternative, would result in significantly better protection of the preserve's natural and cultural resources than would result if the preserve continued to be managed as it is now (that is, under Alternative A). Any of the action alternatives would also result in significantly improved visitor experiences and increased visitor understanding of the preserve.

Among the action alternatives,

- The Preferred Alternative and Alternative E would provide for a greater expression of vegetative species diversity than any other alternative because these alternatives would place a strong emphasis on the prairie landscape and those processes documented to increase diversity. While some very limited impacts to vegetation may occur, these alternatives would have the lowest impacts to vegetation from visitation and development, thus allowing for maximum species expression.
- The Preferred Alternative and Alternative E would involve similar impacts from visitor use to vegetative cover. These alternatives would result in fewer impacts to vegetative cover than Alternative B, and significantly fewer impacts to vegetative cover than Alternatives C & D. Because they call for minimal formal trail development and they emphasize rehabilitation of existing roads, the Preferred Alternative and Alternative E would both allow for protection of vegetation that might be lost through the development of trails and through compaction, erosion, etc., on road surfaces.
- Alternative E would provide for a greater improvement to water quality than any other alternative because of the lack of construction directly related to watercourses and the reduction in the number of stocked grazers. Reduction in these activities would reduce sediment loads, erosion, and other factors known to affect the quality of water resources.

- The Preferred Alternative and Alternative E would provide for the greatest knowledge of natural resources because of the emphasis on the prairie landscape and associated processes, the emphasis on the integration of information gained from an intensive inventory and monitoring program, and external research.
- Alternative B would provide for the preservation and restoration of a greater number of cultural landscape features than the Preferred Alternative, and a significantly greater number of cultural landscape features than the other alternatives, because of its emphasis on protecting and interpreting the physical expressions of a cohesive cultural landscape.
- Alternative E would allow for more deterioration of cultural resources than any other action alternative because the emphasis would be on the protection and interpretation of the tallgrass prairie ecosystem preserve-wide.
- Alternative C would facilitate achievement of more visitor experience goals than any other alternative. Alternative D would result in achievement of the fewest number of visitor experience goals.
- Visitor access to bison would be limited under Alternative B. Access to bison would be greatest under Alternative C or E.

## **ISSUES DISMISSED FROM FURTHER CONSIDERATION**

Executive Order 12898 requires federal agencies to address disproportionately high and adverse human health or environmental effects of their program and policies on minorities and low income populations and communities. The alternatives presented in this EIS would have no such adverse effects. The alternatives would not result in any effect specific to any minority or low-income community. People of all races and income status have had opportunities to participate in the public involvement processes conducted with this plan. Consultations were conducted with American Indians; no adverse effects were identified that disproportionately affect these groups.

## IMPACTS OF ALTERNATIVE A

Under the no action alternative, the NPS would have a very limited role in the management of the preserve. This would place more responsibility on the NPT. There would be no general management plan to guide decisions on the management or development of the preserve. As land management is not a primary focus of the NPT, that organization could elect to divest its interests in the preserve. A future owner other than NPT may or may not be inclined to continue current trends towards resource protection and visitor use of the land.

### Natural Resources

#### Vegetation

The prairie vegetation would proceed toward a monoculture of grasses with an emphasis on forage production. The fire schedule and grazing intensity would favor perennials and grasses over annuals and spring forbs. Brome would continue to be grown in Fox Creek bottomlands. Exotic plants (noxious weeds) would be controlled, thereby preventing further encroachment on native populations. Riparian vegetation along Fox Creek would continue to decline due to soil compaction and erosion. Vegetation associated with seeps and springs would also be limited or absent due to grazing and soil compaction from cattle. Low impacts to vegetation from visitors could occur due to the absence of new trails and maintenance standards. Gas operations would continue to cause a loss of vegetation due to trampling and/or salt water release.

#### Wildlife

The burning schedule and intensive grazing regime would result in limited nesting cover, habitat, and forage for bird species. Small mammals, reptiles, and amphibians would lack unburned areas for habitat. Terrestrial invertebrates would have sessile life stages threatened. The current grazing regime favors cattle and allows for limited forage and cover for other species. Fish would continue to tend toward silt tolerant species. Other aquatic species that are tolerant of high nutrient loads in streams and ponds during storm events would continue to increase.

#### Threatened and Endangered Species

Specific surveys for these species have occurred and one federally-listed species, the Topeka shiner, was found in two locations. Species of concern to the state or federal agencies may be located as a result of additional investigations. Land managers would meet minimum standards necessary to protect critical habitat if outlined in recovery documents for any species found.

#### Air Quality

Management actions would not be expected to degrade the existing air quality for the preserve. However, increased vehicular traffic from greater visitation may result in limited impacts to air quality in and around parking areas. The burn program would impact air quality during the actual burn, a single event of short duration, with the release of a high concentration of particulate matter occurring during that event.

#### Water Quality

The preserve would experience periods of high coliform levels in water resources during storm runoff events due to animal waste produced during grazing periods. Increased numbers of cattle would increase coliform levels proportionately. The presence of large concentrations of waste would continue to contribute to these high coliform levels after the grazing period is over.

Sedimentation of watercourses would continue also, due to increased erosion caused by direct cattle access to these areas.

## **Cultural Resources**

### **Archeological Resources**

Twelve prehistoric and historic sites have been documented at the preserve. No archeological program would be in place, and management responsibility for these sites would be dependent upon the direction and management philosophy of the landowner; inventories and evaluations would be done on a site-by-site basis for compliance purposes. The lack of a comprehensive survey could result in a negative impact on the long-term management of the archeological resources. Unidentified or unprotected sites would continue to be impacted by normal deterioration and by inattention, or more actively by human, vehicular, or animal traffic. Erosion resulting from weather, periodic concentration of cattle in specific areas, or lessee or preserve vehicles could destroy archeological data. Continued annual burns could destroy more fragile surface-lying artifacts. New development could impact unidentified sites.

### **Ethnographic Resources**

No ethnographic program would be in place, and management responsibility for these sites would be dependent upon the direction and management philosophy of the landowner; inventories and evaluations would be done on a site-by-site basis for compliance purposes. The preserve would lack a comprehensive ethnographic survey, possibly resulting in negative impacts to the long-term management and protection of such resources. Access to ethnographic resources by traditionally affiliated cultures would be dependent upon the consent of the landowner. The existing grazing intensity and fire schedule could diminish the frequency and availability of natural resources that also serve as ethnographic resources.

### **Historic Resources**

Management and protection of cultural resources would be dependent on the direction and management philosophy of the landowner. There would be no historic resources plan developed. Some of the major structures, associated developments, and portions of the landscape would receive routine or limited maintenance. It is unlikely that collection management or historic furnishings programs would be established, and those resources would continue to be stored in several locations with inadequate curatorial services that do not meet current NPS preservation standards. The risk of loss by theft, vandalism, and fire would be high because of a lack of security and fire suppression systems. New development could adversely impact the open character of the historic cultural landscape.

A concentration of visitor traffic would continue to occur at the barn parking area, the ranch headquarters area, the school, and via the existing tour bus route, increasing the impact on resources such as the barn, corrals, house, the school, and associated landscapes. The ranch house would continue to serve as the primary visitor contact facility, with a high concentration of pedestrian traffic and related high probability of impacts to the historic fabric and museum collection in portions of the house.

Periodic concentration of cattle in specific areas, and repeated use of lessee or preserve vehicles in specific areas could contribute to erosion and deterioration of structures and landscape features, such as structure ruins, stone walls, plantings, and roads. The remainder of known and

unidentified historic resources would have no long-term strategies for treatment, and would be allowed to deteriorate.

## **Socioeconomic Environment**

Since the “no action” alternative represents a continuation of the existing conditions, there would be very little or no impact to the region’s socioeconomic characteristics, including land cover and use, demographic characteristics, general economy, and visitor services.

The greatest impacts, though still relatively minor, would be in the areas of visitor services and employment resulting from an increase in visitation to the preserve.

Visitation to the preserve is likely to increase, regardless of the management alternative selected. This increase likely would result in moderate increases in the number of food service, lodging, and camping facilities in the area. A minor increase would be expected in other visitor service facilities, too, including grocery and specialty stores, gas stations, auto repair, medical and dental services, and financial services such as banks and ATMs. These increases would likely occur in the small towns directly adjacent to the preserve and could result in increased employment and population in the region.

## **Visitor Services/ Visitor Use**

The preserve would look much as it does to today’s visitors in that vistas within the preserve might remain unimpaired by unnecessary development depending on the management practices instituted by the landowner. Gas wells would still be visible in the backcountry.

Visitation to backcountry locations of the preserve would be very limited and would be facilitated by the current landowner/lessee access policy. There would be times when visitors would be unable to experience certain portions of the preserve, such as during periods of seasonal prescribed fire, high grassland fuel loads, or during certain cattle management operations.

Visitors would be unable to observe native grazers (bison) and would not be able to experience tall grasses once common to the bottomlands.

Interpretation services would function without a Comprehensive Interpretation Plan. Depending on the abilities and resources of the landowner, interpretation and education services could be limited due to lack of personnel and other resources. Visitors would not be as likely to experience the greater prairie ecosystem and come to understand the complex interactions within these plant and animal communities. They may not have opportunities to appreciate the value of related prairie sites in the U.S. and worldwide. During periods of peak visitation, visitor densities may be high in the historic ranch headquarters area, creating negative visual impacts and experiences for some visitors. There would likely be noticeable impacts as a result of these visitor densities, including trampling of grass and other vegetation, soil erosion, and loss of historic fabric in or at historic buildings.

Visitors with disabilities would be accommodated to the degree possible through programming or facility design in accordance with the Americans with Disabilities Act of 1990.

Sanitation would remain a problem due to limited comfort station facilities (chemical toilets would likely continue to be the only facilities available). Visitor safety may be negatively affected due to limited personnel, unimproved infrastructure, and lack of specific emergency response capabilities.

Visitor access to the property would be limited during spring burns; the burns, however, would reduce the fire danger.

## IMPACTS OF PREFERRED ALTERNATIVE

In the following discussion, reference may be made to one of the four management areas specified in this alternative: Visitor Information and Orientation Area, Flint Hills Ranching Legacy Area, Day Use Area, and Prairie Landscape Area. Please see Figure 4 for a map locating these areas.

### Natural Resources

#### Vegetation

Prairie vegetation would tend toward greater diversity under this alternative and would therefore provide more habitat for invertebrates, small mammals, and birds. Varying the fire regime and grazing patterns, and reducing animal concentrations would allow a wide range of vegetative patterns within a single unit: some areas would remain unburned, others would be burn completely, and still others would be burned at some intermediate level. Early spring forbs and annuals would be allowed fuller expression. Areas where grazing regimes require large numbers of animals within limited space would experience declines in annuals and spring forbs.

The brome would be removed and prairie species would be restored along Fox Creek. Some demonstration row crops also would be planted within the Fox Creek riparian area. Exotic species (noxious weeds) would be controlled. Riparian vegetation would be allowed to recover and would be protected, as would the vegetation associated with springs and seeps. Day use, such as hiking and horseback riding; activities such as research collecting; and repeated patterns of human use may cause loss of vegetation due to trampling, soil compaction, or collection by researchers. Exotic species could be introduced as a by-product of horseback operations unless managed. Non-mechanized access to overnight camping areas may cause some loss of vegetation due to soil compaction. The development and use of existing roads would reduce trampling and compaction of soil, thus resulting in a lower vegetation loss. Rehabilitation of gas development sites and related roads would restore native vegetation lost by soil compaction or salt-water discharge.

#### Wildlife

Establishing an area for the reintroduction of bison would reduce the amount of area available for the early intensive stocking of cattle. Initially, the bison area would have a small number of animals resulting in patchy grazing, thus encouraging access by other native grazers. By varying fire regimes and leaving patches of prairie unburned, habitat for nesting birds, small mammals, and insects would increase. Vertebrate and invertebrate life forms also would have an increased likelihood of propagation within the resulting patchy vegetation. Areas that continued under intense grazing regimes would continue to have large concentrations of animals within limited space, and would show declines in bird, small mammal, amphibian, reptile, and insect habitat during the spring and early summer.

Sedimentation transport, erosion, and nutrient loads within sensitive aquatic resources would be lessened due to reduced animal stocking rates. These changes, combined with access restrictions and the restoration of riparian areas, could cause an increase in species of fish that lack tolerance to heavy silt and gravel. Hardened stream crossings would affect hydrology and may serve as barriers to fish migration/spawning during low water.



### **Threatened and Endangered Species**

To facilitate protection of threatened and endangered species, site specific surveys would target areas such as springs, seeps, and unnamed tributaries that may contain species of concern for state and federal agencies. Any areas found to contain species of concern would receive higher priority for resource management activities designed to protect those species. The establishment of an ongoing inventory program and research effort to guide management decisions would contribute significant information regarding restoration, species of concern, and habitat requirements.

While the reduction in the number of grazers would lessen sedimentation loads, certain actions proposed under this alternative, such as trail or road work, could result in increased runoff to area streams, thereby increasing sedimentation and degrading habitat necessary for the Topeka shiner and the cardinal shiner. Any such action would be carefully planned to minimize the opportunity for runoff and appropriate mitigation measures would be applied.

The National Park Service has entered into informal consultation with the U.S. Fish and Wildlife Service as required by Section 7 of the Endangered Species Act (16 U.S.C. § 1536 (c) (1)). As part of this consultation, the NPS has prepared a biological assessment (BA) for the preferred alternative regarding listed and proposed species. The BA determined that the preferred alternative might, but is not likely to, adversely effect the Topeka shiner. The preferred alternative would have no effect on the bald eagle.

Because this GMP is a conceptual, programmatic planning document, it does not allow for site- or project-specific impact assessment. Therefore, the NPS has committed (as part of the BA) to consult with the U.S. Fish and Wildlife Service before initiating any action that would potentially impact a listed species.

The U.S. Fish and Wildlife Service has concurred with the determinations of the biological assessment.

### **Air Quality**

Management actions would not be expected to degrade the existing air quality at the preserve. However, increased vehicular traffic from visitation may result in limited impacts to air quality in and around parking areas. The air quality would be impacted by several short duration releases of particulate materials in high concentrations when fires were burning under the fire management program. There would be an increase in ambient dust during construction, rehabilitation, and maintenance work.

### **Water Quality**

Reduced stocking rates of grazers would result in reduced animal waste runoff during storm events, lower coliform levels, and lower nutrient concentrations in preserve waterways. Activities associated with the restoration of the areas now in brome and the annual planting of agricultural crops in small areas may cause limited periods of increased siltation in Fox Creek.

The overall sedimentation rates in sensitive aquatic resources would be lower since grazers would be restricted from these areas. As a result of these restrictions, some stream reaches, seeps, and springs would recover vegetation that has been lost due to past trampling and soil

compaction. Restoration of vegetative buffers would improve water quality, since the vegetation would provide filtering effects and would help reduce the duration and intensity of flood events. There would be appropriate erosion control measures taken during construction.

Water crossings at uncontrolled points (points other than at paved low-water crossings or on already established roads) could break down established stream banks, accelerate erosion, and contribute to headcutting inside drainages. This could lead to increased sedimentation in local segments and eutrophication in areas immediately adjacent to crossing locations.

## **Cultural Resources**

### **Archeological Resources**

Archeological resources would be preserved and protected. Limiting development and improvements, and controlling motorized traffic would reduce potential impacts to archeological sites. Expanded park operations, or increased visitation in concentrated areas, could negatively impact known resources and sites.

Establishing campsites in the Prairie Landscape Area could impact previously unknown archeological resources, depending on their location and size. Preliminary to any physical development, these impacts would be mitigated through archeological surveys. Minor impacts on previously unknown archeological resources could be caused by construction associated with the Visitor Information and Orientation Area.

### **Ethnographic Resources**

Ethnographic resources would be managed for traditional practices preserve-wide. Limiting improvements and controlling motorized traffic would reduce potential impacts to the ethnographic resources. Expanded park operations, or increased visitation in concentrated areas, could negatively impact known resources and sites. Natural resource protection, the introduction of native ungulates in the Prairie Landscape Area, and prairie enhancement activities may increase the frequency and availability of natural resources determined to be ethnographic resources.

Depending on their location and size, establishing campsites in the Prairie Landscape Area could impact previously unknown ethnographic resources. Minor impacts on previously unidentified ethnographic resources could be caused by construction associated with the Development Area.

### **Historic Resources**

Under this alternative, the historic resources located in the Flint Hills Ranching Legacy Area would receive the greatest degree of protection through preservation. The restoration and use of historic resources and landscape features would aid in the preservation of the resources. Restoring or rehabilitating some plantings, orchards, gardens, and agricultural use areas would enhance the interpretation of the evolution of the historic landscape. The open character of the cultural landscape would be protected. Museum collections would be stored and exhibited in the Visitor Information and Orientation Area, and would meet current NPS preservation standards. Placing visitor facilities, administrative facilities, and maintenance facilities in the Visitor Information and Orientation Area would reduce the sensory and physical impacts of visitor and vehicular traffic at the historic ranch headquarters area and the school.

Rehabilitating some structures and historic circulation patterns could impact some of the resources' character-defining features. Heavy wear on historic resources could occur in areas of high visitor use, resulting in a slight impact to the historic character and to the materials of the historic resources. Increased visitor use levels, in both vehicular and foot traffic, could impact historic materials. In the Day Use Area and Prairie Landscape Area, the stabilization of historic resources would provide some protection for features of the cultural landscape, but could also result in the greater potential for deterioration to the resources through weather and erosion, and through the impact of grazers. There would be a loss of historic fabric and information for those resources that were allowed to deteriorate. Depending upon the conclusions of inventories and evaluations, the removal of some stock ponds and roads could remove elements of the historic cultural landscape. The location of animal management facilities could minimally impact the viewshed of the historic cultural landscape. Camping activities could also have a negative impact on cultural landscapes, depending on the site, location, size, and use levels.

## Socioeconomic Environment

Overall, there would be very little or no impact on the region's socioeconomic characteristics. Most of the changes would arise from the expected increase in visitation to preserve-based developments. Given the relative size of the preserve, 10,894 acres (4398.1 hectares) compared to the three-county region (nearly 1.5 million acres; 605,561 hectares), any change to the preserve's land use or land cover would result in little or no impact. Increased visitation and the induced stimulus to economic growth are expected to result in very minor changes to the region's total population and age distribution. Increased employment opportunities, a result of this economic growth, could attract more people to the region.

The current trend of increasing numbers of senior citizens in the region may be slowed somewhat by the influx of working-age individuals and families, resulting in a very minor change to the age distribution. No impacts on the gender, ethnic/race, or urban/rural distribution of the population of the region are expected. This alternative would not result in adverse human health or environmental conditions for any persons living in the region. Thus, those persons identified as living below the poverty level would not be disproportionately affected by the alternative.

The construction and restoration work on the preserve may create more short-term opportunities for employment, and some service-related jobs that are created may be seasonal in nature. Impacts on the general economic characteristics of the region would be driven by increased visitation, which would result in some increase in both the number of establishments and amount of earnings in the service and retail trade sectors. The construction of new service and retail facilities, as well as increased employment and population in the region, would encourage growth within all sectors of the economy. The current trend toward small businesses is expected to continue. Construction and restoration work, as well as general preserve operations would benefit a variety of suppliers and their employees.

The agricultural component of the preserve would change from the current conditions, as bison would be introduced on 1,000+ acres (404+ hectares) of the preserve, limiting the amount of forage available for cattle grazing. Cattle grazing would be further limited, as cattle would be excluded from springs and seeps where sensitive native plant and animal species are found, and from riparian areas. Portions of the historic agricultural use areas and bottomland tallgrass prairie would be restored along Fox Creek. However, all of these changes to land use, agricultural use, and output would be very minor, in relationship to the region overall.

Expansion within the general economy, due to increased visitation to the preserve, would create additional employment opportunities and would result in a very minor increase in employment in the region. A small number of jobs would be created on the preserve; most of these would be relatively high paying when compared to prevailing wage rates. General economic growth and increased employment opportunities in the region may cause a

very minor increase in regional per capita income. No change, or a small decrease in existing poverty levels within the region, may take place.

The initial acquisition of approximately 29 acres (11.7 hectares) of preserve land by the NPS would result in this land being removed from local tax roles. The current tax revenue generated by this land is estimated to be approximately \$3100.00. To compensate local governments for this loss of revenue, 31 U.S.C. 6904 provides that the federal government shall make a payment in lieu of taxes (PILT) to the local government that is equal to one percent of the fair market value of the land (not to exceed the amount of real property taxes levied on the property during the last fiscal year before the fiscal year in which the land is acquired). This PILT shall be made for the five fiscal years after the fiscal year in which the land is acquired. The remaining land on the preserve, not acquired by the NPS, would still be subject to property taxes, which would be paid by the NPT or its successor.

The tourism sector is likely to change the most among all the socioeconomic factors in the region, as a result of increased visitation. Moderate increases in the number of food service, lodging, and camping facilities would be expected. This increase would be necessary to meet the needs of growing numbers of visitors to the preserve. A minor increase would be expected in other visitor services, including grocery and specialty stores, gas stations, auto repair, medical and dental services, and financial services such as banks and ATMs. These increases would likely occur in the small towns directly adjacent to the preserve.

Preserve visitation likely would be seasonal in nature, thus affecting the service-related jobs in terms of both income and length of employment.

## **Visitor Services/ Visitor Use**

Vistas would remain unimpaired by unnecessary development within the preserve. As gas wells and associated roads were removed from the preserve, those sites would be rehabilitated, resulting in enhanced vistas in portions of the preserve.

Visitors would be able to see and experience native grazers (bison) on a significant portion of the prairie, Visitors also would be able to experience tall grasses by walking through them in restored bottomland prairie in addition to the Southwind Trail.

Implementation of this alternative would permit a variety of activities and experiences including day hiking, overnight camping, nature study, and horseback riding. Though visitation may be limited during certain portions of the year, for resource management purposes and visitor safety concerns, visitors would have access to a high percentage of the preserve most of the year.

Cultural resources would be stabilized, preserved and enhanced, resulting in a quality experience for visitors seeking contact with remnants of the past. Interpretation and education programming would focus on a variety of time periods represented by cultural resources at the preserve, thus enabling visitors to develop a greater understanding and appreciation for the preserve interpretation themes.

Visitors with disabilities could be accommodated to the degree possible through programming and facility design in accordance with the Americans with Disabilities Act.

Proper sanitation and enhanced public health would result from the development of appropriate facilities. During periods of high visitation, visitor densities may be high in the historic ranch headquarters area and other areas. Facilities would be designed to minimize visitor impacts to park resources. Visitor use limits would be established to reduce impacts to resources and visitor experience.

Visitor safety would be ensured through adequate staffing, adherence to prescribed guidelines, improved infrastructure, and enhanced emergency response capabilities.

## Other Impacts

### Cumulative Impacts

Cumulative impacts are impacts on the human environment that result from the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions, regardless of which government agency or private entity undertakes such actions. Cumulative impacts result from individually minor, but collectively significant, actions that occur over a period of time.

The actions proposed in this alternative should contribute to few cumulative impacts to the preserve and to the surrounding environs.

Proposed programs that would enable the preserve to initiate resource protection, inventories, and monitoring would provide the preserve with information that would be beneficial to those involved in research to protect tallgrass prairie ecosystems. Similarly, knowledge gained about the preserve's cultural resources would complement the efforts of historic and preservation groups throughout the region.

If prescribed fires within the preserve are held concurrently with other planned burns on nearby private lands, air quality in the Chase County area could be adversely impacted for short periods of time. If fires on adjacent lands inadvertently cross property lines onto the preserve, efforts to maintain a heterogeneous burning/grazing regime could be temporarily sidetracked. Fires on the preserve also could cross onto adjacent lands, affecting fire regimes on those lands. A Fire Management Plan will be developed with public input that will address cooperative and collaborative efforts to mitigate these effects.

Increased development in the area of the preserve could result in degradation of the cultural landscape. Further, improperly installed septic systems could degrade the quality of streams and other water bodies on the preserve. The National Park Service will work with local governments to minimize the likelihood of these types of impacts.

### Relationship of Short-Term Uses and Long-Term Productivity

The long-term effects would be positive for the enhancement and preservation of both the natural and cultural resources. The potential for meeting visitor expectations at the preserve would be greatly enhanced.

### Irreversible and Irrecoverable Commitment of Resources

Irreversible commitments of resources include the destruction of non-renewable resources such as historic fabric and archeological resources. Even with mitigation measures, some historic fabric and archeological resources may be lost during restoration and maintenance activities and during construction. In addition, should the visitor center/administration/maintenance/shuttle complex be located within the preserve, some prairie would be lost. Irrecoverable commitment of resources includes committing resources, and associated funding, to such activities as construction, restoration, and maintenance. With these commitments, this funding and these renewable resources are lost for other activities.

## IMPACTS OF ALTERNATIVE B

In the following discussion, reference may be made to one or more of the management areas identified for this alternative: Cultural Area, Natural Area, Development Area, and Special Use Area. Please see Figure 5 for a map locating these areas.

### Natural Resources

#### Vegetation

This alternative proposes a small management area where natural processes would be given the greatest emphasis. Early spring forbs and annuals would be allowed greater expression. The larger area emphasizing cultural resources would still allow for protection and preservation of the tallgrass prairie, but the overriding concern and emphasis in this larger area would be for cultural resources. While the prairie vegetation within the larger area would tend toward greater diversity under the varying fire regime, grazing patterns, and animal concentrations, competing interests such as cultural resource preservation, agricultural use, historic structure maintenance, etc. could affect prairie enhancement activities.

The brome would be removed as a cultivated crop, and prairie species would be restored in Fox Creek bottomlands. Exotic species (noxious weeds) would be controlled. Riparian vegetation, as well as the vegetation associated with springs and seeps, would be allowed to recover and would be protected. Some impacts to vegetation, such as trampling and soil compaction, would occur due to visitor activities and the lack of new trails (causing visitors to establish “volunteer trails”). Although camping opportunities would be limited under this alternative, some loss of vegetation could occur due to soil compaction where camping occurs. Areas adjacent to gas wells would continue to experience vegetation loss. Restoration of agricultural areas, orchards, and gardens may introduce exotic species but it is unlikely that they would spread to native prairie areas.

#### Wildlife

The establishment of a Natural Area with bison as the primary grazer would reduce the amount of cattle placed on the land through intensive stocking regimes; the resulting ungrazed areas or areas of incomplete grazing would encourage access by other native grazers. The varying fire regimes would allow dispersed habitat for nesting birds, small mammals, and insects.

Sediment transport, erosion, and nutrient loads in sensitive aquatic resources would be reduced due to access restrictions and the restoration of riparian areas. Silt intolerant fish species should increase due to reduced animal stocking rates and lower sedimentation loads.

#### Threatened and Endangered Species

Surveys and monitoring efforts would be issue-driven and would not specifically target species of concern. Certain actions proposed under this alternative could result in increased runoff to area streams, thereby increasing sedimentation and degrading habitat necessary for the Topeka shiner and the cardinal shiner. Any such action would be carefully planned to minimize the opportunity for runoff. Appropriate mitigation measures would be applied. The National Park Service would consult with the U.S. Fish and Wildlife Service before initiating any action that would potentially impact the Topeka shiner (as required by Section 7 of the Endangered Species Act).

Although the biological assessment was not based on Alternative B, the National Park Service believes that the basic determinations (i.e., “findings”) would be valid for this alternative. This belief would be discussed and verified with the U.S. Fish and Wildlife Service prior to signing any record of decision based on Alternative B.

### **Air Quality**

Management actions would not be expected to degrade the existing air quality at the preserve. However, increased vehicular traffic from visitation may result in limited impacts to air quality in and around parking areas. The air quality would be impacted by several short duration releases of particulate materials in low concentrations during prairie burns. There would be an increase in ambient dust during construction, rehabilitation, and maintenance activities.

### **Water Quality**

Reduced stocking levels of grazers may result in less animal waste runoff during storm events and lower coliform levels and nutrient concentrations.

The sedimentation rates would be lower with grazers excluded from sensitive aquatic resources. Vegetation in some stream reaches, seeps, and springs would recover from trampling and soil compaction. There would be appropriate erosion control measures taken during construction.

Water crossings at uncontrolled points (points other than at paved low-water crossings or on already established roads) could break down established stream banks, accelerate erosion, and contribute to headcutting inside drainages. This could lead to increased sedimentation in local segments and eutrophication in areas immediately adjacent to crossing locations.

## **Cultural Resources**

### **Archeological Resources**

Archeological resources would be preserved and left undisturbed within all areas of the preserve. Limitations on improvements and control of motorized traffic would reduce potential impacts to archeological sites.

Expanded park operations, or increased visitation in concentrated areas, could negatively impact known resources and sites. Depending on their location and size, campsites in the Natural Area and the Development Area would have the potential to impact previously unknown archeological resources. Unknown archeological resources could be impacted by construction associated with the Development Area.

### **Ethnographic Resources**

Ethnographic resources would be managed for traditional practices preserve wide. Limited improvements and restricted motorized traffic in the natural area would reduce potential impacts to ethnographic resources. Expanded park operations, or increased visitation in concentrated areas, could negatively impact known resources and sites. Natural resource protection, the introduction of native ungulates in the Natural Area, and prairie enhancement activities in the Cultural and Natural areas may increase the frequency and availability of natural resources that are determined to be ethnographic resources.

Depending on their location and size, campsites in the Natural and Development areas have the potential to impact previously unknown ethnographic resources. Construction associated with the Development Area may impact previously unidentified ethnographic resources.

### **Historic Resources**

The majority of historic resources in the preserve would be preserved, protected, and interpreted. All significant structures in the Cultural Area would be restored. Restoring, rehabilitating, or stabilizing historic features, archeological sites, plantings, orchards, gardens, and agricultural use areas throughout the preserve would contribute to the interpretation of the evolution of the historic landscape. Reducing the visual impacts associated with gas and oil operations and limiting motorized traffic would protect the open character of the cultural landscape. Archival and curatorial management of for museum collections would be provided in the development area, and meet current NPS preservation standards. Consolidating visitor, administrative, and maintenance facilities in the Development Area would reduce the sensory and physical impacts of visitor and vehicular traffic at the historic ranch headquarters area and the school.

Rehabilitating significant historic circulation patterns could impact some of the resources' character-defining features. Heavy wear on historic fabric could occur in areas of high visitor use, resulting in a slight impact to the historic character and materials of the historic resources. Increased visitation levels, in both vehicular and foot traffic, could impact historic materials. In the natural area, the stabilization of historic resources would provide limited protection of features of the cultural landscape, but could also result in the greater potential for the deterioration of resources through weather and erosion, and through the impact of grazers. The location of animal management facilities in the natural area could impact portions of the viewshed of the historic cultural landscape. Camping opportunities could also have a negative impact on cultural landscapes, depending on the site, location, size and use levels.

### **Socioeconomic Environment**

The impacts of Alternative B are very similar to those described for the Preferred Alternative, except in the following areas.

Alternative B is expected to have no significant impact on regional agricultural output. It incorporates various combinations of cow-calf, season-long, year-round cattle, and crop production activities. Thus, while the overall level of regional agricultural output will not be affected, the composition of agricultural output at the local level could be affected.

### **Visitor Services/ Visitor Use**

Visitation to the park's cultural resources would permit use and enjoyment of much of the scenery of the preserve. Some dispersed backcountry camping would be available to visitors and solitude would be possible. Impacts of gas and oil operations on visitors would be limited.

Visitor access would be facilitated by public transportation to major areas of the preserve. Visitor interpretation and education would vary from area to area; programs would be adapted to high visitor densities in the Cultural Area and very low densities in the Dispersed Use Area. Visitors would not have opportunities to hunt and fish on the preserve. Interpretive signs and markers would be placed in the primary historic structure areas, but hiking trails would not be developed for visitors beyond what is available at present. Design of new development would be sensitive to visitor concerns and interests, and would maintain harmony and continuity with the landscape's natural and cultural features.



The emphasis of interpretation and education programming would be the cultural history of the preserve. In the Dispersed Use Area, many cultural resources would be stabilized only, resulting in visitor awareness of resource degradation over the long term. All historic orchards, plantings, and gardens would be replanted and available as a focus for visitor interpretation and education, resulting in a large number of historic “scenes” compared to the other alternatives.

A small area would be devoted to prairie enhancement, creating a minimal opportunity for visitors to experience natural processes. The bottomland tallgrass prairie restoration area would be accessible to visitors. Visitors would be able to see and bison in a small area, although bison would not be readily visible by most visitors, as they would be located in a more remote section of the preserve.

The number of bison would be small and restricted to specific areas, reducing the chances for visitor injuries. During periods of prescribed fire activities, visitors would be excluded from certain portions of the preserve. Visitor safety and comfort would be enhanced by a centralized public transportation system.

Visitors with disabilities would be accommodated to the degree possible through programming and facility design in accordance with the Americans with Disabilities Act.

Proper sanitation and public health would be enhanced by the development of appropriate facilities. During periods of high visitation, visitor densities may be high in the ranch headquarters area and other areas of the preserve. Facilities would be designed to reduce visitor impacts to resources. Visitor use limits would be established to reduce impacts to preserve resources and enhance visitor experiences.

Visitor safety would be ensured through adequate staffing, adherence to prescribed guidelines, improved infrastructure, and enhanced emergency response capabilities.

## **Other Impacts**

### **Cumulative Impacts**

Cumulative Impacts are expected to be the same as for the preferred alternative.

### **Relationship of Short-Term Uses and Long-Term Productivity**

Proposed actions such as the removal of non-historic facilities, the construction of camping areas, or the removal of roads to restore native prairie vegetation would require relatively minor disturbance of soils, vegetation, and habitat. Mitigation measures would be used. Constructing facilities in the Development Area would result in larger disturbances, and mitigation measures would be used to lessen that impact. The long-term effect on the natural and cultural environment would be minor in terms of habitat or resource loss, but the visitor experience would be greatly improved and the potential for meeting visitor expectations at the preserve would be enhanced.

### **Irreversible and Irretrievable Commitment of Resources**

Some historic fabric and archeological and ethnographic resources could be lost through some developments proposed in Alternative B. Rehabilitating structures could result in loss of historic fabric. Restoring native vegetation could remove cultural landscape features from the preserve, along with possible archeological or ethnographic resources. Construction within the Development Area could also result in the loss of both cultural and natural resources, even with mitigating measures. Irretrievable commitment of resources would include the commitment of

renewable resources in the construction of new campgrounds, trails, and facilities in the Development Area, and the use of funds to carry out these activities.

## IMPACTS OF ALTERNATIVE C

In the following discussion, reference may be made to one or more of the management areas identified for this alternative: Development Area, Moderate Use Area, and Dispersed Use Area. Please see Figure 6 for a map locating these areas.

### Natural Resources

#### Vegetation

This alternative would emphasize visitor experience while enhancing the tallgrass prairie. Through the use of varying fire regimes, grazing patterns, and animal concentrations, prairie vegetation would tend toward greater diversity in those areas with dispersed use or highly regulated use. Early spring forbs and annuals would be allowed to express themselves more fully. Some impacts to vegetation would occur because of the emphasis on meeting the visitor experience goals.

The brome would be removed and prairie species would be restored in Fox Creek bottomlands. Exotic species (noxious weeds) would be controlled. Riparian vegetation would be allowed to recover and would be protected, as would the vegetation associated with springs and seeps. Visitor activities would be of a low-impact nature, and there would be a lack of new trails and maintenance activities, which would further limit impacts to vegetation. However, allowing camping in the Dispersed Use Area may cause some loss of vegetation due to soil compaction in the camping areas.

#### Wildlife

The Dispersed Use Area, where bison would be the primary grazer, would attract other native grazers due to the variations in grass heights and grazing patterns that would result from limiting the number of animals on the land. The varying fire regimes would allow habitat for nesting birds, small mammals, and insects.

Sediment transport, erosion, and nutrient loads in sensitive aquatic resources would be reduced due to access restrictions and restoration of riparian areas. Silt intolerant fish species may increase due to reduced animal stocking rates and sedimentation loads.

#### Threatened and Endangered Species

Surveys and monitoring efforts would be issue-driven and would not specifically target species of concern. Certain actions proposed under this alternative could result in decreased runoff to area streams, thereby increasing sedimentation and degrading habitat necessary for the Topeka shiner and the cardinal shiner. Any such action would be carefully planned to minimize the opportunity for runoff. Appropriate mitigation measures would be applied. The National Park Service would consult with the U.S. Fish and Wildlife Service before initiating any action that would potentially impact the Topeka shiner (as required by Section 7 of the Endangered Species Act).

Although the biological assessment was not based on Alternative C, the National Park Service believes that the basic determinations (i.e., “findings”) would be valid for this alternative. This belief would be discussed and verified with the U.S. Fish and Wildlife Service prior to signing any record of decision based on Alternative C.

**Air Quality**

Management actions would not be expected to degrade the existing air quality of the preserve. However, increased vehicular traffic from visitation may result in limited impacts to air quality in and around parking areas. The air quality would be impacted by several short duration releases of particulate materials in low concentrations due to fire management activity. There would be an ambient increase in the amount of dust during construction, rehabilitation, and maintenance activities.

**Water Quality**

Reduced stocking levels of grazers may result in less animal waste runoff during storm events, and lower coliform levels and nutrient concentrations. The sedimentation rates would be lower because grazers would be restricted from sensitive aquatic and riparian resources. Vegetation in some stream reaches, seeps, and springs would recover from trampling and soil compaction. There would be appropriate erosion control measures taken during construction. Heavy visitor use may result in increased erosion and sedimentation.

Water crossings at uncontrolled points (points other than at paved low-water crossings or on already established roads) could break down established stream banks, accelerate erosion, and contribute to headcutting inside drainages. This could lead to increased sedimentation in local segments and eutrophication in areas immediately adjacent to crossing locations.

**Cultural Resources****Archeological Resources**

Archeological resources would be preserved and left undisturbed. Limitations on improvements and restrictions on motorized traffic in the Dispersed Use Area would reduce potential impacts to archeological sites. Expanded park operations and increased visitation in concentrated areas could negatively impact known resources and sites. Campsites, depending on their location and size, could impact previously unknown archeological resources in the Dispersed Use Area. Minor impacts on previously unknown archeological resources could be caused by construction associated with the Development Area, and development associated with visitor transportation sites and hardened trails in the Moderate Use Area.

**Ethnographic Resources**

Ethnographic resources would be managed for traditional practices. Limitations on improvements and the control of motorized traffic in the Dispersed Use Area would reduce potential impacts to ethnographic resources. Expanded park operations and increased visitation in concentrated areas could negatively impact known resources and sites. Natural resource protection, the introduction of native ungulates in the Dispersed Use Area, and prairie enhancement activities may increase the frequency and availability of natural resources that are determined to be ethnographic resources.

Depending on their location and size, campsites in the Dispersed Use Area may impact previously unknown ethnographic resources. Construction associated with the Development Area, visitor transportation sites, and hardened trails in the Moderate Use Area could impact previously unidentified ethnographic resources.

## Historic Resources

Select historic resources, chosen as the best examples for interpretation purposes, would be protected through restoration and preservation; others would be stabilized. Restoration of historic plantings, agricultural crops, or orchards would be more limited, and would be used to create demonstration plots for interpretation purposes. The open character of the cultural landscape would be protected through limiting visual impacts associated with gas and oil operations, controlling trail use and development, and placing restrictions on motorized traffic. Archival and curatorial management of museum collections would be provided in the Development Area, and would meet current NPS preservation standards. Placing visitor, administrative, and maintenance facilities in the Development Area would reduce the sensory and physical impacts of visitor and vehicular traffic at the historic ranch headquarters area and the school.

Rehabilitating infrastructure in the Moderate Use Area may remove some character-defining features of the historic resources. Heavy wear on historic resources could occur in areas of high visitor use, resulting in an impact to the historic character and materials of the historic resources. Increased visitation levels, in both vehicular and foot traffic, could impact historic materials. The removal of existing roads in the Dispersed Use Area could remove elements of the historic cultural landscape. The location of animal management facilities in the Moderate Use Area could impact the viewshed of the cultural landscape. The stabilization of most historic resources would provide minimum protection for features of the cultural landscape, but could also result in a greater potential for deterioration of the resources from weather and erosion, and from the impact of grazers.

Camping opportunities in the Dispersed Use Area could also have a negative impact on the cultural landscape, depending on the site, location, size, and use levels.

## Socioeconomic Environment

The impacts of Alternative C are very similar to those described for the Preferred Alternative, except in the following areas.

Alternative C would result in a very minor change in land use patterns for the region. Over half of the preserve acreage would be devoted to the grazing of bison. Cattle operations would be restricted to a smaller portion of the preserve than at present, affecting the level of regional agricultural output; this decrease in output, however, would be very minor. Some agricultural demonstration plots in the Fox Creek floodplain would be developed. The significance to the land use of the region as a whole would be very minor.

With the decreased emphasis on agriculture, there could be a very small decrease in the number of employees associated with agricultural operations. However, any decrease in this area would be offset by the increased employment associated with increased visitation and services.

## Visitor Services/ Visitor Use

Visitation to the preserve's three use areas would permit access to and enjoyment of much of the scenery of the preserve. Some dispersed backcountry camping would be available to visitors and solitude would be possible.

Bison would be accessible to visitors in a large backcountry section of the preserve. The bottomland tallgrass prairie restoration area would be accessible to visitors to experience and enjoy.

Visitor access would be facilitated by public transportation. Visitor interpretation and education programming and facilities would be offered primarily in the Development Area, and to a lesser degree in the Moderate Use Area. Visitor recreational pursuits would be the focus of much of the visitor activities. Interpretive signs and markers as well as interpretive trails would be developed throughout much of the preserve. Design of new development would be sensitive to visitor experience goals and interests, and would maintain harmony and continuity with the landscape, and natural and cultural features. A variety of experiences would be available.

Interpretation and education efforts would be concentrated on "best examples" of preserve cultural resources. Some historic orchards, plantings, and gardens would be replanted and available to the visitor. Season long and cow-calf cattle operations would be interpreted.

During periods of prescribed fire management activities, visitors would be excluded from certain portions of the preserve. Visitor safety and comfort would be enhanced by a centralized public transportation system.

Visitors with disabilities would be accommodated through programming and facility design in accordance with the Americans with Disabilities Act.

Proper sanitation and public health needs would be provided through the development of appropriate facilities. During periods of high visitation visitor densities may be very high in the ranch headquarters area and other areas of the preserve. Facilities would be designed to reduce visitor impacts to resources. Visitor use limits would be established to reduce impacts to the resources and enhance visitor experiences.

Visitor safety would be ensured through adequate staffing, adherence to prescribed guidelines, improved infrastructure, and enhanced emergency response capabilities.

## Other Impacts

### Cumulative Impacts

Cumulative Impacts are expected to be the same as for the preferred alternative.

## **IMPACTS OF ALTERNATIVE D**

In the following discussion, reference may be made to one or more of the management areas identified for this alternative: Grazing Area, Ranch Operations Area, and Fox Creek Floodplain Area. Please see Figure 7 for a map locating these areas.

### **Natural Resources**

#### **Vegetation**

Prairie vegetation would tend toward greater diversity within the confines of a rigorous monitoring program to prevent over-utilization under the dual emphasis of ranching and the tallgrass prairie ecosystem. Varying fire regimes, varying grazing patterns, and changes in grazer concentrations would result in greater diversity, but dilution of that diversity would remain high due to the ranching emphasis. Early spring forbs and annuals would be allowed greater expression.

The brome would be removed and prairie species would be restored in Fox Creek bottomland. Exotic species (noxious weeds) would be controlled, but the increased visitor use, especially associated with horse use, may result in additional exotic plant species becoming introduced. Riparian vegetation would be allowed to recover and would be protected, as would the vegetation associated with springs and seeps. Recreational uses such as trail rides, wagon rides, and hiking; and activities such as trail construction may cause soil compaction, resulting in a negative impact on vegetation.

#### **Wildlife**

The grazing area containing both cattle and bison would encourage access by other native grazers due to the varying height of grasses and different grazing patterns that would result from the lighter stocking rate. The varying fire regimes would allow increased habitat for birds, small mammals, and insects, as well. Sediment transport, erosion, and nutrient loads in sensitive aquatic resources may decrease due to access restrictions and the restoration of riparian areas. Silt intolerant fish species may increase due to a reduction in intensive early stocking rates and lower sediment loading.

#### **Threatened and Endangered Species**

Surveys and monitoring efforts would be issue-driven and would not specifically target species of concern. Certain actions proposed under this alternative could result in increased runoff to area streams, thereby increasing sedimentation and degrading habitat necessary for the Topeka shiner and the cardinal shiner. Any such action would be carefully planned to minimize the opportunity for runoff. Appropriate mitigation measures would be applied. The National Park Service would consult with the U.S. Fish and Wildlife Service before initiating any action that would potentially impact the Topeka shiner (as required by Section 7 of the Endangered Species Act).

Although the biological assessment was not based on Alternative D, the National Park Service believes that the basic determinations (i.e., “findings”) also would be valid for this alternative. This belief would be discussed and verified with the U.S. Fish and Wildlife Service prior to signing any record of decision based on Alternative D.

### **Air Quality**

Management actions would not be expected to degrade the existing air quality at the preserve. However, increased vehicular traffic from visitation may result in limited impacts to air quality in and around parking areas. The air quality would be impacted by several short duration releases of particulate materials in low concentrations during fire management activities. Increases in ambient dust would occur during construction, rehabilitation, and maintenance activities.

### **Water Quality**

Reduced stocking levels of grazers may result in less animal waste runoff during storm events, and lower coliform levels and nutrient concentrations. The sedimentation rates may be lower by restricting grazers from sensitive aquatic resources. Vegetation in some stream reaches, seeps, and springs would recover from trampling and soil compaction. There would be appropriate erosion control measures taken during construction.

Water crossings at uncontrolled points (points other than at paved low-water crossings or on already established roads) could break down established stream banks, accelerate erosion, and contribute to headcutting inside drainages. This could lead to increased sedimentation in local segments and eutrophication in areas immediately adjacent to crossing locations.

## **Cultural Resources**

### **Archeological Resources**

Archeological resources would be preserved and protected. Restrictions on trail development would reduce impacts to archeological sites. Expanded park operations and increased visitation in concentrated areas could negatively impact known resources and sites. Minor impacts to previously unknown archeological resources could be caused by limited development in the grazing area.

### **Ethnographic Resources**

Ethnographic resources would be managed for traditional practices. Restriction on trail development would reduce potential impacts to ethnographic resources. Expanded park operations and increased visitation in concentrated areas could negatively impact known resources and sites. Natural resource protection, the introduction of native ungulates in the grazing area, and prairie enhancement activities may increase the frequency and availability of natural resources that are determined to be ethnographic resources. Development in the Grazing Area could impact previously unidentified ethnographic resources.

### **Historic Resources**

Select historic resources would be protected through restoration, rehabilitation and preservation; others would be stabilized. Restoration of some historic plantings or agricultural crops in the Fox Creek bottomland would not be extensive, yet would enhance the interpretation of the cultural landscape. The open character of the cultural landscape would be protected by reducing visual impacts associated with gas and oil operations, controlling trail development, and limiting motorized traffic. Museum collections and archives would be stored in several locations in rehabilitated historic structures in the Ranch Operations Area. Maintaining museum collections at a variety of locations would impact accessibility to the collections. The museum collections would be managed according to NPS preservation standards.



There would be some loss of historic fabric, as those resources not chosen for preservation, rehabilitation, or stabilization would be documented and allowed to deteriorate. The stabilization of certain historic resources would provide some protection of features of the cultural landscape, but may result in deterioration of other resources through weather and erosion, and through the impact of grazers. Maintaining visitor, administrative, and maintenance facilities in the Ranch Operations Area would preserve some historic structures through adaptive use, although some historic fabric may be lost. The sensory and physical impacts of visitor and vehicular traffic at the headquarters area would remain high, and there would be a high potential for negative impacts to the historic resources. Depending upon the conclusions of inventories and evaluations, removing some stock ponds in the Grazing Area may eliminate elements of the historic cultural landscape. The location of animal management facilities in the Grazing Area may impact the viewshed of the cultural landscape.

## **Socioeconomic Environment**

The impacts of Alternative D are very similar to those described for the Preferred Alternative, except in the following areas.

Regional land use would experience a very minor change. The majority of preserve acreage would be designated as bison grazing, and cattle grazing would be restricted to a smaller portion of the preserve. Agricultural use in the region would experience only a very minor change, as cattle grazing would be restricted to a small portion of the Grazing Area. This smaller area within the Grazing Area would be set aside for livestock operations, and for agricultural development. The decrease in regional agricultural output, however, would be very minor. The decreased emphasis on agricultural operations would likely result in a very small decrease in the number of employees associated with the agricultural operations, but this would be more than off-set by increased employment in the area of visitor services.

## **Visitor Services/ Visitor Use**

Visitors would have access to and enjoyment of much of the scenery of the preserve. Some dispersed backcountry camping would be available to visitors and solitude would be available.

The bottomland tallgrass prairie restoration area would be accessible to visitors. Visitors could experience existing cultural resources in a historic or ranch setting with adaptively used buildings. Some historic orchards, plantings, and gardens would be replanted and available to the visitor. A variety of visitor experiences would be available.

Interpretation and education would focus on the tallgrass prairie ecosystem and subsequent human interaction with the prairie, including both American Indian and ranching themes. Bison would occupy a large part of the preserve. Traditional cattle operations would be accessible near the historic ranch buildings and in the core visitor use areas. Demonstrations of ranch activities would provide some of the recreational as well as interpretive and educational opportunities at the preserve.

During periods of prescribed fire management activities, visitors would be excluded from certain portions of the preserve. Visitor safety and comfort would be enhanced by a centralized public transportation system.

Visitors with disabilities would be accommodated through programming and facility design in accordance with the American with Disabilities Act.

Sanitation and public health would be enhanced through the development of appropriate facilities. During periods of high visitation, visitor densities in the ranch headquarters area and other areas of the preserve may be high. Facilities would be designed to reduce visitor impacts to the resources. Visitor use limits would be established to reduce impacts to the resources and enhance visitor experiences.

Visitor safety would be ensured through adequate staffing, adherence to prescribed guidelines, improved infrastructure, and enhanced emergency response capabilities.

## **Other Impacts**

### **Cumulative Impacts**

Cumulative Impacts are expected to be the same as for the preferred alternative.

### **Irreversible/ Irretrievable Commitment of Resources**

Even with mitigation measures, some historic fabric would be lost as the result of adaptive use and restoration and stabilization activities. Some resources would be allowed to deteriorate and would be lost. Expenditure of funds to implement this alternative would be an irreversible commitment of monetary resources.

## IMPACTS OF ALTERNATIVE E

In the following discussion, reference may be made to one or more of the management areas identified for this alternative: Native Ungulate Management Area, Demonstration Areas, Cultural Area, and Development Area. Please see Figure 9 for a map showing the location of these areas.

### Natural Resources

#### Vegetation

The prairie landscape and the associated processes responsible for its development would be the major focus of this alternative. Prairie vegetation would tend toward greater diversity under the varying fire regimes, grazing patterns, and grazer concentrations. Early spring forbs and annuals would have greater expression.

The brome would be removed and prairie species would be restored along Fox Creek bottomlands. Exotic species (noxious weeds) would be controlled. Riparian vegetation would be allowed to recover and would be protected, as would the vegetation associated with springs and seeps. Some limited impacts to vegetation could occur due to low impact visitor activities: off-trail walking could trample vegetation and the lack of new trails and maintenance could encourage such activity. However, the lack of trail development and the rehabilitation of existing roads also would result in vegetative recovery in many areas.

#### Wildlife

The restoration of bison as the grazer of choice may encourage use by other native grazers, due to the lighter stocking rate, which would result in varying heights of grasses and different grazing patterns. The varying fire regimes would allow increased habitat for nesting birds, small mammals, and insects.

Sediment transport, erosion, and nutrient loads in sensitive aquatic resources would be reduced due to access restrictions and the restoration of riparian areas. Silt intolerant fish species may increase due to reduced animal stocking rates and reduced sediment loading of streams.

#### Threatened and Endangered Species

Surveys and monitoring efforts would be issue-driven and would not specifically target species of concern. Certain actions proposed under this alternative could result in increased runoff to area streams, thereby increasing sedimentation and degrading habitat necessary for the Topeka shiner and the cardinal shiner. Any such action would be carefully planned to minimize the opportunity for runoff. Appropriate mitigation measures would be applied. The National Park Service would consult with the U.S. Fish and Wildlife Service before initiating any action that would potentially impact the Topeka shiner (as required by Section 7 of the Endangered Species Act).

Although the biological assessment was not based on this Alternative E, the National Park Service believes that the basic determinations (i.e., “findings”) would be valid for

this alternative. This belief would be discussed and verified with the U.S. Fish and Wildlife Service prior to signing any record of decision based on Alternative E.

### **Air Quality**

Management actions would not be expected to degrade the existing air quality of the preserve. However, increased vehicle traffic from visitation may result in limited impacts to air quality in and around parking areas. The air quality would be impacted by several short duration releases of particulate materials as a result of the fire management program. Ambient dust may increase during construction, rehabilitation, and maintenance activities.

### **Water Quality**

Reduced stocking levels of grazers may result in less animal waste runoff during storm events, and lower coliform levels and nutrient concentrations. The sedimentation rates may be lower due to restriction of grazers from sensitive aquatic resources. Vegetation in some stream reaches, seeps, and springs would recover from trampling and soil compaction. Construction affecting water resources would be minimal under this alternative, but where such actions are initiated, there would be appropriate soil erosion measures taken.

Water crossings at uncontrolled points (points other than at paved low-water crossings or on already established roads) could break down established stream banks, accelerate erosion, and contribute to headcutting inside drainages. This could lead to increased sedimentation in local segments and eutrophication in areas immediately adjacent to crossing locations.

## **Cultural Resources**

### **Archeological Resources**

Archeological resources would be preserved and protected. Restrictions on infrastructure development would reduce impacts to archeological sites. Expanded park operations and increased visitation in concentrated areas could impact known resources and sites. Impacts on previously unknown archeological resources could be caused by development of visitor services and support facilities.

### **Ethnographic Resources**

Ethnographic resources would be managed. Restrictions on infrastructure development would reduce impacts to ethnographic sites. Expanded park operations and increased visitation in concentrated areas could impact known resources and sites. Natural resource protection, the introduction of native ungulates, and prairie activities may increase the frequency and availability of natural resources determined to be ethnographic resources. Impacts on previously unidentified ethnographic resources could be caused by development of visitor services and support facilities.

## Historic Resources

A few, select historic resources, chosen as integral to the interpretation goals of the preserve, would be preserved and protected; others useful for preserve operations would be rehabilitated. Restoration of historic agricultural crops in a small demonstration area in the Fox Creek bottomlands would not be as extensive as in the Preferred Alternative and Alternatives B, C, and D, yet would enhance interpretation of the cultural landscape. The open character of the cultural landscape would be protected by reducing visual impacts associated with gas and oil operations, controlling trail development, and limiting motorized traffic. Archival and curatorial management of museum collections would be provided in the Development Area, and would meet current NPS preservation standards. Placing visitor, administrative, and maintenance facilities in the Development Area would reduce the sensory and physical impacts of visitor and vehicular traffic at the ranch headquarters area and the school.

There would be some loss of historic fabric, as those resources not chosen for preservation and rehabilitation would be documented and allowed to deteriorate. There could be some loss of historic fabric from rehabilitated structures. Park operations, or increased visitation levels, in both vehicular and foot traffic, could impact historic materials. Depending upon the outcome of inventories and evaluations, removing some stock ponds and existing roads could remove elements of the cultural landscape. The location of animal management facilities in the Native Ungulate Management Area could impact the viewshed of the cultural landscape.

## Socioeconomic Environment

The impacts of Alternative E are very similar to those described for the Preferred Alternative, except in the following areas.

This alternative would result in the greatest change in land use in the preserve area, as the majority of land would be converted from cattle grazing to managed tallgrass prairie with bison. A cattle operation would still be present on the preserve, but on a much smaller area. A small Agricultural Demonstration Area would be maintained and planted in traditional crops. A small Development Area containing the main visitor services and support facilities would be maintained. Although this would be a fairly significant change in preserve land use, from agricultural (cattle grazing) to non-agricultural (bison), the size of the preserve in relationship to the region indicates that the alternative would result in a very minor change to regional land use.

This alternative would have an impact on the level of regional agricultural output, because livestock and crop activities on the preserve would be limited to a smaller area than under current conditions. This decrease in regional agricultural output, however, would be very minor.

A decreased emphasis on agricultural operations on the preserve would likely result in a very small decrease in the number of employees associated with these agricultural

operations. This decrease, however, would be outweighed by the increased employment associated with increased visitation.

New development on the preserve would be minimal, as existing buildings and structures would be used as much as possible. Any buildings not rehabilitated for use in preserve operations would be allowed to deteriorate. A small Development Area would contain the main visitor services and support facilities. No roads or trails would be developed outside of the ranch headquarters area.

## **Visitor Services/ Visitor Use**

Visitors would have access to and enjoyment of much of the scenery of the preserve through limited development. A variety of experiences would be available. No overnight camping would be permitted. No developed trails would be available outside the historic ranch complex. Visitors would see fewer stock ponds and human-made pond structures.

Interpretation and education would focus on the tallgrass prairie ecosystem and human interaction with the prairie, including both American Indians and ranchers. Demonstrations of ranch activities would provide some of the recreational as well as interpretive and educational opportunities at the preserve.

The number of bison would be large and they would be found in a large area of the preserve, creating the possibility of conflicts with visitors. During periods of prescribed fires activity, visitors would be excluded from certain portions of the preserve. Visitor safety and comfort would be enhanced by a centralized public transportation system.

Visitors with disabilities would be accommodated through programming and facility design in accordance with the Americans with Disabilities Act.

Proper sanitation and public health would be provided through the development of appropriate facilities. During periods of high visitation, visitor densities may be high in the ranch headquarters area. Facilities would be designed to reduce visitor impacts to the resources. Visitor use limits would be established to reduce impacts to resources and enhance visitor experiences.

Visitor safety would be ensured through adequate staffing, adherence to prescribed guidelines, improved infrastructure, and enhanced emergency response capabilities.

## **Other Impacts**

### **Cumulative Impacts**

Cumulative Impacts are expected to be the same as for the preferred alternative.

### **Irreversible Commitment of Resources**

Even with certain mitigation measures there may be some loss of historic fabric and resources through adaptive use and rehabilitation. Some resources would be allowed to deteriorate and would be lost. Expenditure of funds to implement this alternative would involve the irreversible commitment of monetary resources.