Environmental Assessment

Flint Hills Legacy Conservation Area

Kansas

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Prepared by

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In accordance with the National Environmental Policy Act and U.S. Fish and Wildlife Service policy, an environmental assessment and land protection plan have been prepared to analyze the effects of establishing the Flint Hills Legacy Conservation Area in eastern Kansas. This document is the final environmental assessment, revised after analyzing public comments. The land protection plan is a separate document.

- The environmental assessment analyzes the environmental effects of establishing the Flint Hills Legacy Conservation Area.
- The land protection plan describes the priorities for purchasing up to 1,100,000 acres of easements within the proposed project boundary.

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Abbreviations

EA	environmental assessment
FHLCA	Flint Hills Legacy Conservation Area
GIS	geographic information system
HAPET	Habitat and Population Evaluation Team
KLT	Kansas Land Trust
KDWP	Kansas Department of Wildlife and Parks
LCC	landscape conservation cooperative
LPP	land protection plan
LWCF	Land and Water Conservation Fund
NEPA	National Environmental Policy Act
NLCD	National Land Cover Database
NRCS	Natural Resources Conservation Service
NREL	National Renewable Energy Lab
NWR	National Wildlife Refuge
NWRS	National Wildlife Refuge System
PFW	Partners for Fish and Wildlife program
RTK	The Ranchland Trust of Kansas
Service	U.S. Fish and Wildlife Service
SHC	strategic habitat conservation
TLA	Tallgrass Legacy Alliance
TNC	The Nature Conservancy
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service

1 Purpose of and Need for Action

"Conservation is a state of harmony between men and land."
—Aldo Leopold

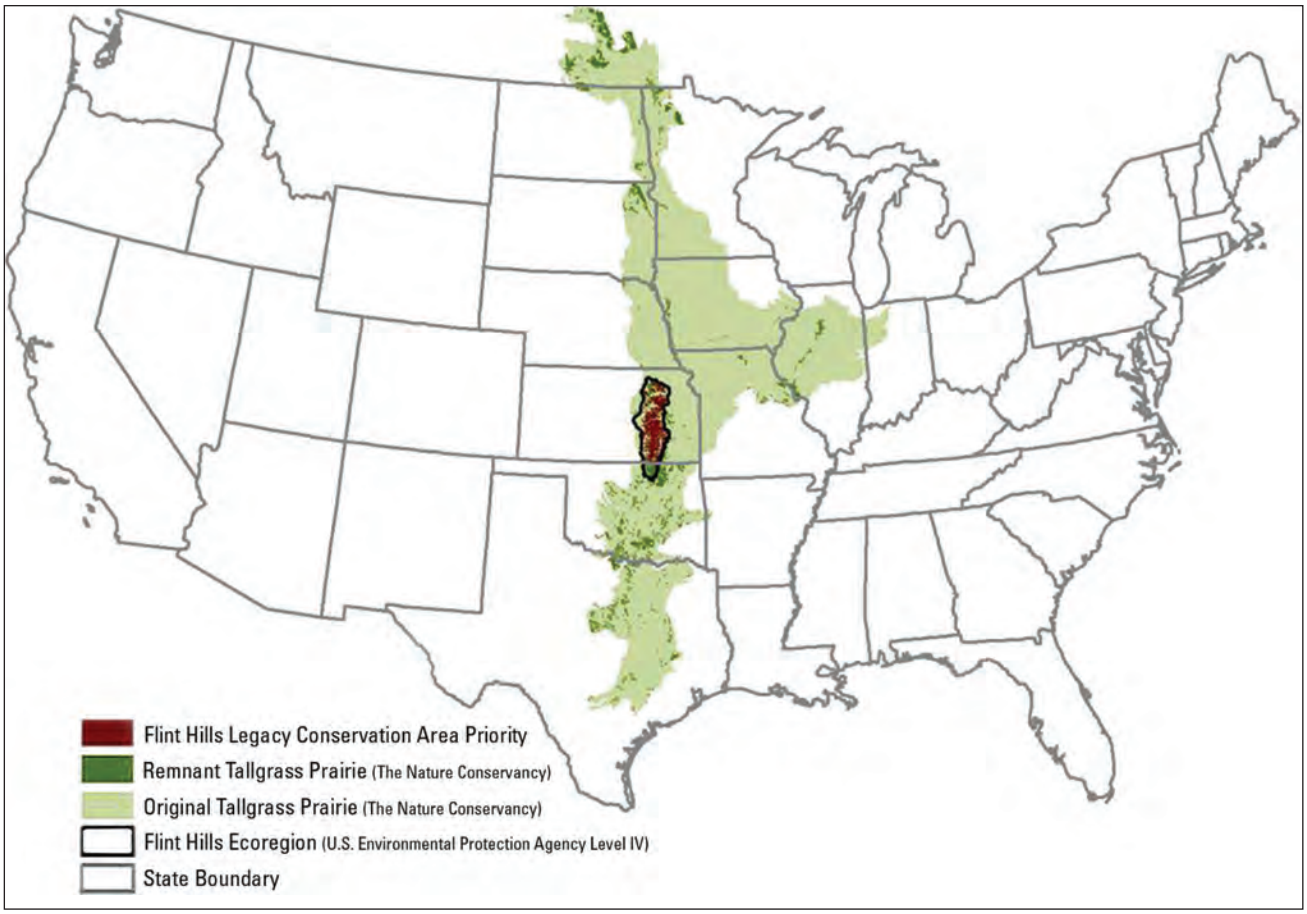


Figure 1. Historical tallgrass prairie distribution.

The lands east of the Rocky Mountains were once a vast sea of grass extending as far east as the deciduous forests of Kentucky and Ohio. The eastern third of this vast grassland is called the tallgrass prairie, often called the "true" prairie. Tallgrass prairie once covered more than 170 million acres from Texas to Canada (Samson et al. 1999) (figure 1). As America expanded westward during the 19th century, settlers found the rich soils associated with the tallgrass prairie ideal for growing crops and converted much of the original landscape for agriculture.

Today, less than 4 percent of this once vast grassland region remains (Steinauer and Collins 1996). Given that amount of loss, it is no wonder grassland birds are the fastest declining avian cadre in North America. Cultivation, agriculture, tree encroachment, and development activities have pushed grassland-dependent species into ever-shrinking areas of tallgrass prairie. Approximately three-fourths of the remaining tallgrass prairie lies within the Flint Hills ecoregion of eastern Kansas and northeastern Oklahoma, with about 6 million acres present in the Kansas portion. The outer edge of this region is presently suffering a rapid conversion to forest due in part to a declining fire culture within the agricultural communities of the region. The inner core of this region (approximately 3.3 million acres) is relatively intact to date, offering potential for long-term social stability, and ecosystem function and value.

The Flint Hills area is a treasured landscape of gently-sloping limestone and chert hills. Today, two hundred years after Zebulon Pike explored the Flint Hills, one can still witness the same unobstructed vistas that he described in his journal. The central core, running in a north-south configuration, has persisted as a relatively unfragmented expanse of

tallgrass prairie because of limestone outcrops that discouraged plowing, and because of a ranching culture that recognized the ecological importance of fire when living and working within a fire climax ecosystem. Since about 1860, the predominant use of the Flint Hills uplands has been cattle ranching.

The Flint Hills Legacy Conservation Area (FHLCA) is part of a landscape-scale, strategic habitat conservation effort to protect a unique, highly diverse, and largely unfragmented area of tallgrass prairie. Located in eastern Kansas, the region provides important habitat for a diverse array of native wildlife species, including the threatened Topeka shiner, greater prairie-chicken, Henslow's sparrow, short-eared owl, Bell's vireo, American golden-plover, grasshopper sparrow, dickcissel, eastern meadowlark, upland sandpiper, buff-breasted sandpiper, scissor-tailed flycatcher, loggerhead shrike, Smith's longspur, Harris' sparrow, northern harrier, Swainson's hawk, and other grassland-dependent species. Rich with history, the Flint Hills ranching culture has maintained grazing and fire as necessary tools for tallgrass ecosystem health.

While ranching has helped maintain the last intact portion of tallgrass prairie and much of the region's biodiversity, there are concerns that incompatible industrial and residential development could threaten this unique landscape. Left unabated, such development will likely diminish this important agricultural and biological resource for future generations.

PROPOSED ACTION

The U.S. Fish and Wildlife Service is proposing to establish a voluntary conservation easement program in eastern Kansas called the Flint Hills Legacy Conservation Area (figure 2). The project boundary encompasses roughly 3.3 million acres, within which the Service would strategically acquire conservation easements on up to 1.1 million acres of private land.

The Service would seek all acquisition in the form of perpetual conservation easements from willing sellers. The project would not involve fee-title acquisitions. The easement program would rely on voluntary participation from landowners. Grazing and prescribed fires would continue on the land included in the easement contract. Landowners could continue to pursue development on properties without Service conservation easements. All land within an easement would remain in private ownership and, therefore, property tax and grassland management activities such as invasive plant and tree control, grazing and prescribed fires would remain the responsibility of the landowner. Public access to the land would also remain under the control of the landowner.

Easement restrictions may include but are not limited to preventing development (residential, commercial and industrial), altering the natural topography, converting native grassland to cropland, draining wetlands, and introducing plants that are not native to the Flint Hills.

The proposed easements would help maintain a relatively large, unfragmented block of habitat that would compliment efforts by other land trusts and entities, such as the Ranchland Trust of Kansas, Kansas Land Trust, The Nature Conservancy, National Park Service, Kansas Department of Wildlife and Parks, U.S. Department of Agriculture, and the U.S. Army Corps of Engineers.

PROJECT AREA

The FHLCA project area consists of 3.3 million acres within the Flint Hills ecoregion of Kansas (Omernick 1987). A narrow band running north-south, it is located within 21 counties in eastern Kansas (see figure 2), and stretches from the northern to the southern border of the state. Some tallgrass prairie extends south into Oklahoma, where it is referred to as the Osage Hills. As elsewhere in Kansas where less than 2 percent of the land area is federally owned, private ownership dominates the project area. The main habitat type found within the project area is eastern tallgrass prairie, represented by over ninety native grasses and 500 broadleaf species. The Flint Hills ecoregion contains the largest concentration of freshwater springs in Kansas (Kansas Geologic Survey 2008) and represents the ultimate source of the Caney, Cottonwood, Elk, Fall, Marais des Cygnes (Osage), Neosho, Verdigris, and Walnut rivers.

The total area within the proposed project boundary represents over 3.3 million acres, roughly three times the long-term project goal. This physiographic region represents the world's last intact tallgrass prairie landscape of sufficient size to offer full ecological function. The physical shape and juxtaposition of the up to 1.1 million acres in the priority area targeted for easements is an important component of the project's long-term success. This remaining, high quality, ecologically functioning stretch of tallgrass prairie runs along a north-south axis and is as narrow as 20 miles wide (see figure 2). This narrowness is not a biological choice; it is by default that the project boundary takes this shape, constrained on the east and west by tillage agriculture, woody vegetation, and development.

PURPOSE OF AND NEED FOR PROPOSED ACTION

The purpose this project is to provide the landscape-scale, strategic habitat conservation necessary to maintain ecological community function for eastern

U.S. Fish & Wildlife Service

Flint Hills Legacy Conservation Area
Eastern Kansas

Base Map

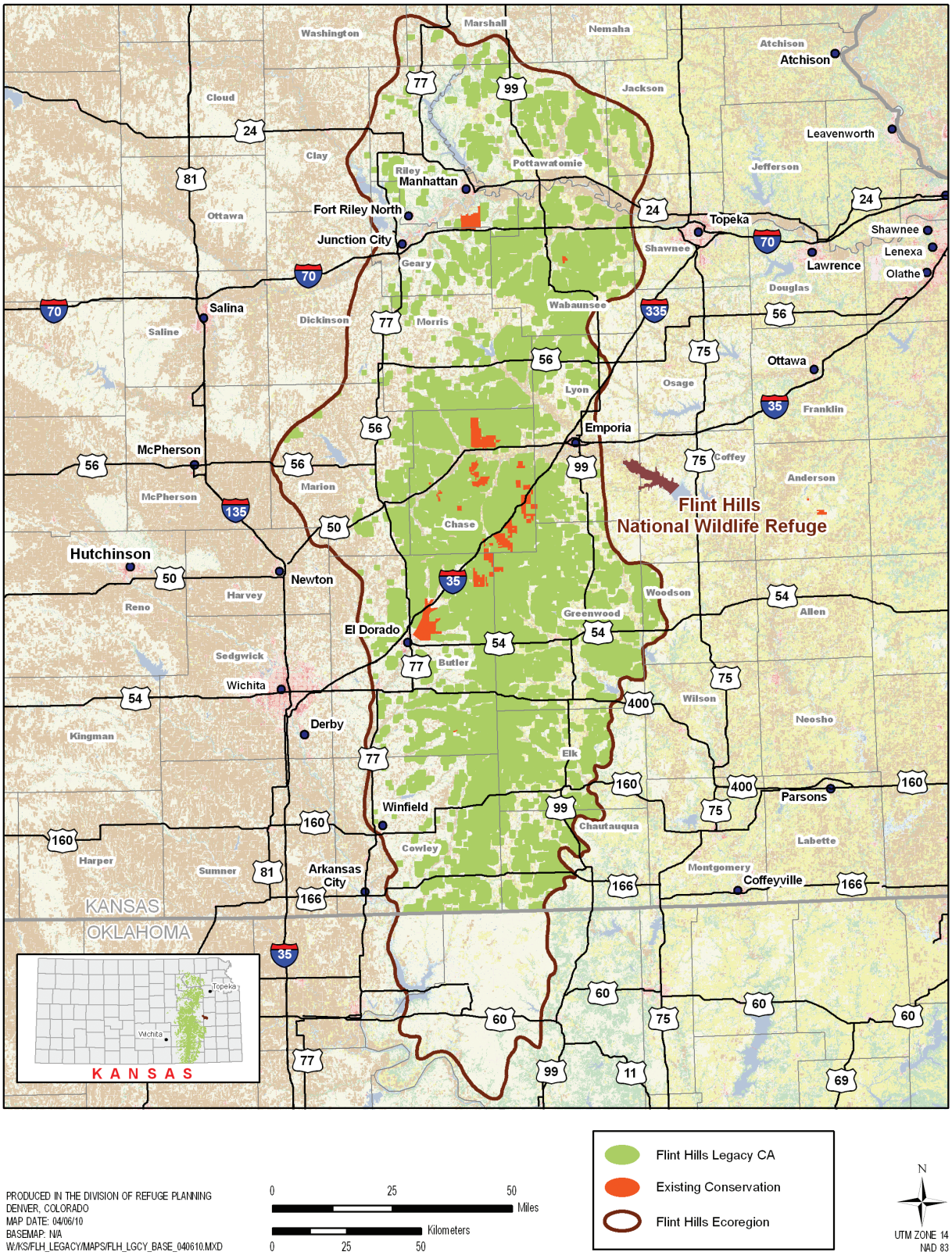


Figure 2. Project map for the Flint Hills Legacy Conservation Area.

tallgrass prairie, including grassland-dependent wildlife. This is especially important for grasslands, because they do not have the localized diversity of geological and elevational gradients that most other ecosystems contain. (Kelly Kindscher, plant ecologist, University of Kansas; personal communication.) This conservation project is needed to help protect the Flint Hills prairie ecosystem from being drastically changed by widespread, unplanned residential or commercial development. The conversion of ranches and rural areas to residential, commercial, and industrial developments, along with forest encroachment, threatens the open expanses of native rangeland that many grassland birds and other prairie-associated wildlife are dependent upon (Huntsinger and Hopkinson 1996).

Based on known conservation principles of landscape ecology, the narrow north-south corridor of remaining tallgrass prairie is exceptionally vulnerable to ecological degradation associated with increased fragmentation. In essence, if this, the world's largest remaining tract of tallgrass prairie becomes any narrower; its ecological functionality will be diminished, reducing the possibility of sustainable populations of fish and wildlife being maintained. The resiliency, or the capacity of the system to absorb changes and disturbances while maintaining its basic structure and function, will be lost.

Currently, the Flint Hills area provides essential breeding, wintering, and migrational habitat for migratory birds such as the greater prairie-chicken, Henslow's sparrow, short-eared owl, Bell's vireo, American golden-plover, grasshopper sparrow, dickcissel, eastern meadowlark, upland sandpiper, buff-breasted sandpiper, scissor-tailed flycatcher, loggerhead shrike, Smith's longspur, Harris' sparrow, Swainson's hawk and northern harrier. Numerous other species of birds, mammals, reptiles and amphibians are known to use the habitat of the Flint Hills (see appendix A).

The Flint Hills represents North America's only remaining landscape-scale expression of tallgrass prairie. Virtually all of what remains is threatened by some form of development—energy including wind and coaled methane development, residential, and general urban expansion. All express direct impacts to the ecosystem, and share a common threat of reducing the ability to use prescribed fire in a region dependent on fire for its existence—it is therefore prudent to conserve the largest, highest quality, feasible representation of this ecosystem.

Due to these threats, the Partners for Fish and Wildlife (PFW) program recognized the Flint Hills as a focus area in their strategic habitat plan. The Service's PFW program has been working with many landowners to help restore and enhance fish and wildlife habitat on private land. PFW activities include habitat restoration and improvement (invasive plant control and grazing, and prescribed fire modifications). However, without long-term landscape-scale protection, the results of current conservation efforts through this program and by many other partners will not be sustainable. The FHLCA program is necessary to protect additional habitat that is not eligible or covered by current Service programs, and will greatly enhance and augment efforts by other agencies and organizations to restore and protect habitats in the Flint Hills prairie region.

The purposes of the Flint Hills Legacy Conservation Area are to:

- preserve landscape-scale ecological integrity of the Flint Hills tallgrass prairie by maintaining, and enhancing the historical native plant, migratory bird, and other wildlife species at a landscape-scale with the support of the associated ranching culture;
- support the recovery and protection of threatened and endangered species and reduce the likelihood of future listings under the Endangered Species Act;
- protect the integrity of tallgrass prairieland associated prairie waters by preventing further habitat fragmentation;
- provide a buffer against climate change, by providing resiliency for the tallgrass prairie ecosystem through landscape-scale conservation;
- protect an intact north-south migration corridor for grassland-dependent wildlife;
- use the built-in resiliency to climate variability of native tallgrass prairie to ensure the continuation of wildlife habitat in the face of the uncertain effect of climate change.

Dave Rintoul/USFWS

Henslow's sparrow.

DECISIONS TO BE MADE

The Service's planning team (see appendix B) will complete an analysis of the environment and management alternatives. Based on the analysis, documented in this environmental assessment, the Service's director of region 6, with the concurrence of the director of the U.S. Fish and Wildlife Service, will make three decisions:

- Determine whether the Service should establish the Flint Hills Legacy Conservation Area.
- If yes, select an approved, conservation-easement project boundary that best fulfills the habitat protection purposes.
- If yes, determine whether the selected alternative would have a significant impact on the quality of the human environment. The National Environmental Policy Act of 1969 requires this decision. If the quality of the human environment would not be significantly affected, a finding of no significant impact will be signed and made available to the public. If the alternative would have a significant impact, completion of an environmental impact statement would be required to address those impacts.

ISSUES IDENTIFIED AND SELECTED FOR ANALYSIS

Open houses were held in Alma, Cottonwood Falls, and Wichita Kansas in November and December 2009. Public comments were taken to identify issues to be analyzed for the proposed project. Approximately 148 landowners, citizens, and elected representatives attended the meetings and most expressed positive support for the project. Additionally, ninety letters providing comments and identifying issues and concerns were also submitted.

In addition, the Service's field staff contacted local government officials, other public agencies, and conservation groups which have expressed an interest in and a desire to provide a sustainable future for the Flint Hills tallgrass region. Approximately 400 factsheet flyers were mailed out, and project information was also made available on the refuge and regional planning websites.

Many of the comments received addressed the need for a balance between natural and cultural systems. There are two main categories of commonly expressed issues and concerns.

Biological Issues

- Effects of wind energy development, oil and gas exploration and development, and residential development.
- Concern that only a small percentage of tallgrass prairie remains.
- Concern about the conservation of the remaining tallgrass prairie in Oklahoma.
- Concern about short-term activities (including annual prescribed fires and early, intensive grazing) having long-term impacts to the tallgrass prairie.
- Effects of tree encroachment from a lack of fire use due to absentee landowners, different land management priorities by some landowners, and development.
- Possible reintroduction of species historically occurring in the region.
- Possible effects to the air and water quality of the area with increasing development.

Socioeconomic Issues

- Effect of wind energy development, and oil and gas exploration and development.
- Possible tax implications of conservation easements.
- Need to preserve the working ranches, and culture of the region.
- Need to preserve history (natural, Native American and ranching heritage).
- Possible long-term implications of easements on land management.
- Potential impacts to the aesthetics, scenic vistas, and natural beauty of the area resulting from development.
- Potential for the development of agri-tourism as a source of income.

USFWS

Bluestem grass in tallgrass prairie.

- Changing, aging population in rural areas.
- Need for increased understanding and appreciation for the tallgrass prairie and area.

Issues Not Selected for Detailed Analysis

Historically, there has been concern about the amount of tax generated to the counties when land protection programs take place. Since the proposed project is a conservation easement program, the land enrolled in the program does not change hands and, therefore, the property taxes paid by the landowner to the county are not affected. Kansas property taxes are based on agricultural value. Since easements will not affect the agricultural value of the property, no changes to the tax base are anticipated.

Development of rural landscapes often leads to increased demand for services and higher costs to rural counties. There would generally be an offset of any perceived reduction in the tax base since the county would not incur the expense of providing services to rural developments.

NATIONAL WILDLIFE REFUGE SYSTEM AND AUTHORITIES

The mission of the National Wildlife Refuge System is to preserve a national network of lands and waters for the conservation, management and, where appropriate, restoration of fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans. The Flint Hills Legacy Conservation Area project would be administered as part of the Refuge System in accordance with the National Wildlife Refuge System Administration Act of 1966 and other relevant legislation, executive orders, regulations, and policies.

Conservation of additional wildlife habitat in the Flint Hills region would also continue to be consistent with the following policies and management plans:

- Land and Water Conservation Fund Act (1965)
- Migratory Bird Treaty Act (1918)
- Endangered Species Act (1973)
- Bald Eagle Protection Act (1940)
- Migratory Non-game Birds of Management Concern in the U.S. (2002)
- U.S. Fish and Wildlife Act (1956)
- North American Waterfowl Management Plan (1994)

RELATED ACTIONS AND ACTIVITIES

The Service is working with other public and private entities to maintain wildlife habitat within the project area. Many organizations in Kansas have recognized the ecological significance of the Flint Hills and the need to bring about conservation in concert with the region's ranching heritage. Ranchers, biologists, federal agencies, and nongovernmental organizations all see a need to protect this remaining tallgrass prairie. Grassroots organizations such as the Tallgrass Legacy Alliance have been working for more than a decade to conserve grasslands in the Flint Hills. The Ranchland Trust of Kansas, Kansas Land Trust, U.S. Department of Agriculture, Kansas Department of Agriculture, and The Nature Conservancy have all also been active in preserving portions of the Flint Hills using conservation easements. Organizations or agencies that are currently holding conservation easements within the conservation boundary include The Nature Conservancy, the Grassland Reserve Program, Ranchland Trust of Kansas, and Kansas Land Trust.

The Nature Conservancy (TNC) is one of many stakeholders who wish to see the ecology and culture of the Flint Hills continue. As part of The Nature Conservancy's ongoing efforts to preserve this impressive prairie landscape, a community-based conservation program called the Flint Hills Initiative was launched in 2001. The Conservancy's conservation goal for the Flint Hills is to maintain the unfragmented nature of this last expanse of tallgrass prairie and to improve the quality of site-specific habitats for target species and natural communities. The Nature Conservancy currently holds 31,436 acres of conservation easements within the Service's proposed project area.

The Grassland Reserve Program (GRP) is a voluntary conservation program administered through the U.S. Department of Agriculture that emphasizes support for working grazing operations, enhancement of plant and animal biodiversity, and protection of grassland under threat of conversion to other uses. Participants voluntarily limit future development and cropping uses of the land while retaining the right to conduct common grazing practices and operations related to the production of forage and seeding, subject to certain restrictions during nesting seasons of bird species that are in significant decline or are protected under federal or state law. A grazing management plan is required for participants. The easement acreage under the Grassland Reserve Program within the Service project area is currently 17,357 acres.

Ranchland Trust of Kansas (RTK), which is an affiliate of the Kansas Livestock Association, was organized as an agricultural-based land trust to hold conservation easements in Kansas. Ranchland Trust of Kansas's mission is to preserve Kansas' ranching heritage and open spaces for future generations through the conservation of working landscapes. Ranchland Trust of Kansas currently has a 655-acre conservation easement in the project area.

Kansas Land Trust (KLT) is dedicated to conserving natural ecosystems, farm and ranch lands, and scenic open spaces; and preserving outdoor recreational opportunities and historical uses of land. Founded in 1990, the KLT advocated in its first years for the passage of conservation easement enabling legislation by the Kansas Legislature, which occurred in 1993. The Kansas Land Trust accepted its first easement in 1994, and has completed thirty-six easements, 3,311 acres of which are in the Service's proposed project area.

Tallgrass Legacy Alliance (TLA) is a not-for-profit grassroots organization dedicated to preserving the ecological, cultural and economic integrity of the tallgrass prairie. The Tallgrass Legacy Alliance is a diverse group with ecological and agricultural interests that has been active on a landscape scale providing information on issues of concern in regards to the Flint Hills region. The Tallgrass Legacy Alliance has also been providing assistance with innovative grazing systems, prescribed fire, and invasive species control (particularly sericea lespedeza) through the use of grants and cost-shares with landowners throughout the Flint Hills.

Private landowners and ranchers have been instrumental in working with the various organizations and agencies to implement conservation projects. More than 98 percent of the project area, including much of the critical habitat for wildlife, is in private landownership.

The Kansas Department of Wildlife and Parks (KDWP) has been a strong partner in the Flint Hills by supporting effective grassland management through landowner technical assistance, Farm Bill implementation, and educational programs.

Partners for Fish and Wildlife (PFW) is a program administered by the Service that provides financial and technical assistance to work cooperatively with landowners to voluntarily restore and enhance wildlife habitat on private land. Since the inception of the PFW program in 1992, the Service has a long and successful history of working with private landowners in Kansas. Since the inception of PFW in 1992 over 349,342 acres of tallgrass prairie have been restored or enhanced.

Infestations of invasive plants such as sericea lespedeza, eastern red cedar, and Osage orange currently are not pervasive in the Flint Hills project area. However, they are present in many watersheds and threaten to spread throughout the project area. In the absence of fire, woody species such as red cedar and Osage orange rapidly invade the tallgrass prairie. In an effort to control invasive plants, the Service's PFW program, The Nature Conservancy, Tallgrass Legacy Alliance, county weed districts, and private landowners have initiated region-wide cooperative efforts. Current tools include educational efforts demonstrating the benefits of prevention with use of prescribed fire, as well as financial assistance for mechanical, biological, and chemical treatments.

HABITAT PROTECTION AND EASEMENT ACQUISITION PROCESS

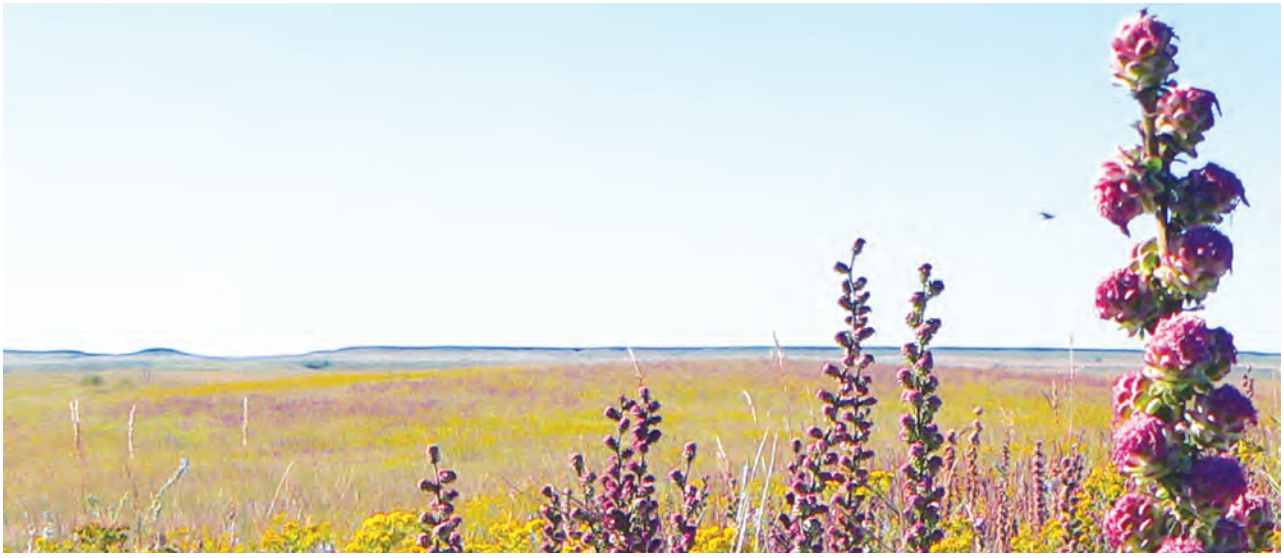
On approval of a project boundary, habitat protection would occur through the purchase of conservation easements. It is the long-established policy of the Service to acquire minimum interest in land from willing sellers to achieve habitat acquisition goals.

The acquisition authority for the proposed Flint Hills Legacy Conservation Area is the Fish and Wildlife Act of 1956 (16 U.S.C.742 a-742j). The federal money used to acquire conservation easements is received from the Land and Water Conservation Fund, which is derived primarily from oil and gas leases on the outer continental shelf, motorboat fuel tax revenues, and sale of surplus federal property.

There could be additional funds to acquire lands, waters, or interest therein for fish and wildlife conservation purposes through congressional appropriations and donations from non profit organizations and other possible sources.

The basic considerations in acquiring an easement interest in private land are the biological significance of the area, the biological requirements of wildlife species of management concern, existing and anticipated threats to wildlife resources, and landowner interest in the program. The purchase of conservation easements would occur with willing sellers only and will be subject to available funding.

2 Alternatives, Including the Proposed Action



USFWS

Tallgrass prairie flowers.

This chapter describes the two alternatives identified for this project that were developed according to National Environmental Policy Act (NEPA) § 102(2)(E) requirements to "study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources." In addition, alternatives which were eliminated from detailed study are briefly discussed as to the reasons they were not further examined:

- no-action alternative
- proposed action, giving the Service the authority to create the Flint Hills Legacy Conservation Area

The alternatives consider the effects of a conservation easement program within the project area boundary identified in this environmental assessment.

ALTERNATIVE A (NO ACTION)

Habitat enhancement or restoration projects on private lands such as water developments, grazing systems, and grassland management could continue through cooperative efforts with private landowners.

Private efforts by land trusts would continue to secure conservation easements.

ALTERNATIVE B (PROPOSED ACTION)

The Service would establish the Flint Hills Legacy Conservation Area in eastern Kansas. The project boundary encompasses roughly 3.3 million acres, of which the Service would strategically acquire conservation easements on up to 1,100,000 acres of private land. The geographic project area extends north almost to the Nebraska state line, south to Oklahoma, west of Topeka, and east of Wichita (see figure 2 in chapter 1). The acquisition acreage total is based in part on the percent of anticipated participation and interest by landowners.

The Service would seek to purchase conservation easements from willing sellers on privately owned native tallgrass prairie grasslands. The easement contract would specify perpetual protection of habitat for trust species and would restrict development.

Prioritization of areas considered for conservation easements within the project area will be based on the biological needs of the wildlife species of concern (grassland-dependent migratory birds and threatened and endangered species), the threat of development, connectivity with other protected lands, and the quality of native tallgrass prairie habitat for trust species. The land protection plan describes these priorities in detail.

Development for residential, and commercial or industrial purposes, such as energy and aggregate extraction may not be permitted on properties under a conservation easement. Alteration of the natural topography, conversion of native grassland to cropland, and the drainage of wetlands would also be prohibited.

All land would remain in private ownership; property tax and land management, including invasive weed and tree control, would remain the responsibility of the landowner. The Service would seek to provide participating landowners with additional assistance for invasive plant control. Control of public access to the land would remain under the control of the landowner.

The easement program would be managed by staff located at the Flint Hills National Wildlife Refuge near Hartford, Kansas. The Service staff would be responsible for monitoring and administering of all easements on private land. Monitoring will include periodically reviewing land status through correspondence and meetings with the landowners or land managers to ensure that the stipulations of the conservation easement are being met. Photo documentation would be used at the time the easements are established to document baseline conditions.

ALTERNATIVES CONSIDERED BUT NOT STUDIED

There was no further analysis conducted for the following six alternatives.

Voluntary Landowner Zoning

Landowners would voluntarily petition the county commissioners to create a zoning district directing the types of development that can occur within an area. This is "citizen-initiated" zoning. For example, landowners would petition the county government to zone an area as agricultural, precluding certain types of non agricultural development such as residential subdivision. "Citizen initiatives" are rarely used and this alternative was not studied further.

County Zoning

In a traditional approach used by counties and municipalities, the local government would use zoning as a means of designating what type of development could occur in an area. Kansas law grants cities and counties the authority to regulate land use, and therefore engaging in planning and zoning activities is optional. Therefore, many counties in Kansas have opted to have no planning or zoning requirements and the alternative was not studied further. Comments received from county commissioners to date have expressed support

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Flint Hills hillside.

instead for conservation easements (alternative B as a means of maintaining rural area values and potentially reducing the need for future zoning). Zoning would be subject to frequent changes, and would not ensure the long-term prevention of residential or commercial development in the conservation area.

Fee-title Acquisition

Some organizations and individuals have expressed an interest in Service-provided oversight and restrictions on management practices of prescribed fire, grazing, and herbicide application in the Flint Hills region. Fee-title purchase of land in the Flint Hills would be required to provide the Service with full authority and responsibility for planning and implementing these management activities. However, little to no public support was expressed for the possibility of fee-title acquisition by the Service in public meetings and correspondence received for the Flint Hills Legacy Conservation Area project. Additionally, recent efforts by the National Park Service to purchase land by fee-title for the establishment of the Tallgrass Prairie Preserve near Strong City met significant opposition due to "a deep seated philosophy that the government should not own land" and concerns about the possible use of eminent domain (National Park Service 2001). These concerns ultimately resulted in a greatly reduced federal ownership (approximately 80 acres) by the National Park Service.

The initial cost associated with fee title acquisition would be two to three times higher than the purchase of conservation easements. In addition, there would be substantial annual costs for staffing and materials needed by the Service to manage fee-title land. The much higher costs associated with this method would result in limiting acquisition to a much smaller area, making landscape scale conservation unlikely.

It is the long-established policy of the Service to acquire minimum interest in land from willing

sellers to achieve Service habitat acquisition goals. Fee-title acquisition is not preferable to the use of conservation easements, nor is this method of acquisition necessary to conserve tallgrass prairie habitat and trust wildlife resources in the Flint Hills region.

Smaller Project Area

During initial scoping, the FHLCA study area acquisition boundary was 2.2 million acres, with the possible purchase of easements on up to 1 million acres within that boundary based on preliminary assessments by Service biologists. Improved data and methods of analysis determined that using the physiographic boundary of tallgrass prairie, and assessing which portions that area still contain >95% prairie grassland provided more accurate, reproducible information (see the "Conservation Design" section on page 34 for specific details). This process determined that grassland prairie covers approximately 3.3 million acres, which became the revised approved acquisition boundary within which the Service would assess acquiring up to 1.1million acres of conservation easements, based on anticipated interest and participation by landowners. A project area smaller than 1.1 million acres would make the conservation of the remaining narrow band of tallgrass prairie habitat and the migration corridor used by grassland-dependent wildlife less likely to succeed in the long term.

Larger Project Area

Initial internal discussions in 2005 included a project for tallgrass conservation easements throughout much (forty-one counties) of eastern Kansas. The Service decided that the project purpose needed further refinement and definition of the conservation objectives, and that the very large size of the potential acquisition boundary be reduced.

Expansion of Project

After the initial phases of the Flint Hills Legacy Conservation Area project were well underway, the possibility of expanding the project area into Oklahoma to incorporate the tallgrass prairie (referred to as the Osage Hills) found there, was brought up. As the FHLCA project planning and outreach efforts had been addressed toward Kansas throughout the process, the Service determined that conservation efforts for the Oklahoma tallgrass will be conducted by region 2 (Southwest Region). The Mountain-Prairie Region, (region 6), will assist region 2 with any future conservation efforts undertaken in the Osage Hills.

3 Affected Environment

Threats to and Status of Resources

This chapter describes the biological, cultural, and socioeconomic resources most likely affected by establishing the Flint Hills Legacy Conservation Area.

The Flint Hills region provides habitat integral to larger national conservation efforts. Located in the Eastern Tallgrass Prairie Geographic Area, the Flint Hills region is a north-south migration corridor for many species.

Wildlife species dependent on tallgrass habitat are dependent on an increasingly shrinking ecosystem; a factor contributing to the rapid decrease of grassland birds dependent on the tallgrass prairie, such as that found in the project area. Intact, open landscapes are essential habitat components for the greater prairie-chicken and other grassland birds that are the priority species guild for this project.

Grasslands once dominated central North America. The eastern third of this vast grassland ecosystem, from southern Manitoba to Illinois and south to Texas, is known as the tallgrass prairie region. The tallgrass prairie, like the Great Plains as a whole, was shaped under disturbances such as fire, grazing and drought. During these cycles of change and disturbance, deep-rooted prairie plants assimilated nutrients and returned them to the surface, creating rich, dark soils considered to be some of the most fertile in the world.

The rich soils, combined with gently rolling topography, made the region prime for agricultural development. Much of the tallgrass prairie was converted to cropland in a single decade, 1870–80, as railroads and Land Acts provided economic incentives. The tallgrass prairie ecosystem has been plowed, fragmented, and in some cases severely degraded, making this once expansive, complex ecosystem one of North America's most altered and endangered ecosystems (Noss et al. 1995). Still relatively unspoiled by the pressures of modern development is the greater Flint Hills landscape of eastern Kansas.

BIOLOGICAL ENVIRONMENT

In this section climate; climate change; adaptation, mitigation, and engagement responses to climate change; geologic resources; habitat; and wildlife of the Flint Hills are discussed.

Climate

The climate of Kansas is continental, with characteristic hot summers, subject to periodic drought coupled with very cold winters. Temperatures can range from –40°F to 121°F.

There is a distinct east-west precipitation gradient across Kansas. The western edge of Kansas lies in a rain shadow of the Rocky Mountains, and receives only 16 inches of precipitation on average. The Flint Hills area receives approximately 33 inches of precipitation, most of which comes in the form of rain between the months of April and September.

Moist Gulf of Mexico air flows over the eastern portion of the state, providing at the easternmost counties on average 42 inches of precipitation. Rainfall events often exceed 3 inches or more. The moist air flow and warm temperatures are the source for convectional thunderstorms and tornadic activity in the area.

Climate Change

Climate change presents additional challenges to habitat conservation in the Great Plains. Temperatures are predicted to increase in future decades throughout the Great Plains (Fagre et al. 2009). The FHLCA provides the elements necessary to minimize the impact on wildlife: resilience, redundancy, adaptation potential, habitat connectivity, drought-tolerant plant communities, large and connected ecosystem segments, and the presence of natural disturbances (fire and grazing).

Due to its plant diversity, tallgrass prairie has a built-in resilience to climate variability. The hundreds of grass and broadleaf species represent a wide range of tolerance for annual rainfall and air temperature. Dominated by perennials, many tallgrass prairie species withstand multiple years of drought, as evidenced by the droughts of the 1950s. Within this diverse plant community, a particular group of species usually grows well, regardless of weather conditions.

Although the species composition of the prairie may shift if a multi-decade drought were to occur, the character of the tallgrass prairie would not be lost. During wet years, some species express themselves and show greater vigor. The same holds true for growing seasons with moderate rainfall and heat.

However, overall biomass is generally greater during years of abundant rainfall. Climate predictions vary, however some suggest warmer winters and similar spring precipitation in the mid-latitudes of the Great Plains (Fagre et al. 2009). Those rainfall events might be more episodic, bringing fewer, yet heavier rains. Whichever climate prediction holds true, the strength of the tallgrass prairie comes from its diverse species that are adapted to a wide range of climatic conditions.

With the species diversity providing resilience to climate change, the current condition of the Flint Hills region provides habitat representation and redundancy. Currently, the FHLCA provides a significant north-south migration corridor for grassland birds, and links many areas of high quality tallgrass habitat. Retaining migratory corridors is a key adaptation strategy for wildlife response to climate change (USFWS 2009).

Adaptation, Mitigation, and Engagement

The Service's strategic response to climate change involves three core strategies: adaptation, mitigation, and engagement (USFWS 2009). Through adaptation, the impacts of climate change on wildlife can be reduced by conserving habitats expected to be resilient. The FHLCA provides an anticipatory, rather than a reactive response. As preserving migratory corridors becomes increasingly important, the Flint Hills will provide a contiguous north-south stand of tallgrass prairie within the Central Flyway. Furthermore, if spring/summer precipitation were to increase in a changing climate, tree encroachment would present an accelerating threat of fragmentation to the Flint Hills. Thus conservation actions are warranted to maintain the intactness of the tallgrass prairie character of the Flint Hills.

Carbon sequestration forms one of the key elements of mitigation. The FHLCA easement program could secure the carbon already stored within Flint Hills soils. Prairie vegetation stores carbon in its deep fibrous roots, with approximately 80% of the plant biomass located belowground. It is equally as important to protect existing carbon stores as it is to sequester atmospheric carbon.

Engagement involves cooperation, communication, and partnerships to address the conservation challenges presented by climate change (USFWS 2009). The FHLCA serves as a model for engagement by working with producers, nongovernmental organizations (Tallgrass Legacy Alliance, The Nature Conservancy, Quail Unlimited, and the Kansas Livestock Association). state and local agencies (KDWP, Kansas Department of Health and Environment, Kansas Farm Bureau, Kansas Association of Conservation Districts) and federal agencies including the Natural Resources Conservation Service.

Geological Resources

The eastern margin of the Flint Hills is marked by a major escarpment that is especially prominent in northwestern Greenwood, southeastern Chase, and eastern Butler counties. Maximum elevations exceed 1,600 feet, with local relief up to 320 feet, and deeply entrenched stream valleys. The prominent escarpment that defines the eastern edge of the Flint Hills is the most rugged surface feature in Kansas. The Walnut, Verdigris, Cottonwood, and Fall river drainage basins meet at divides on the Flint Hills crest in this region. From their eastern crest, the Flint Hills slope gently westward, down the regional bedrock dip, to the western limits of the Walnut and Cottonwood drainage basins.

The Flint Hills are underlain by lower Permian limestone, shale, and evaporites. This bedrock generally dips gently toward the west or northwest. Local variations in bedrock dip are found over the crest of the buried Nemaha uplift. Erosion of shale and limestone strata has resulted in landscapes with steep east-facing escarpments separated by gentle west-sloping cuestas. Thick cherty limestone weathers to produce residual chert lag deposits that are highly resistant to chemical breakdown. Such residual chert, or flint, as it is commonly known, is responsible for maintaining high topographic relief and gives the Flint Hills their name. Unconsolidated sediments are common, especially within river valleys and on some upland areas. Soils are developed in residual (weathered) bedrock material, alluvial deposits, and loess sediment (Aber 1997).

The steep slopes and the thin, rocky soils of the Flint Hills limited crop cultivation to the flatter river and stream bottoms where there are deeper river-deposited sediments. The same rocky limestone soils which made crop cultivation difficult helped to preserve the native characteristics of the Flint Hills, and made the area ideal for cattle grazing. In fact, over a period of time the calcium in the limestone erodes into the soil, making the native prairie plants highly nutritious for grazing animals.

Habitat

Numerous hydrological features bisect the Flint Hills eastward into the prairie. Many other tributaries provide a diversity of riparian plant communities. More than 600 species of vascular plants occur within the project boundary, representing roughly 25% of all the plant species found in Kansas and indicating the significant biological diversity of the Flint Hills. (See figure 3 for land cover and habitat types.)

Fire History

The historic tallgrass prairie, or "true" prairie, occurred along the eastern Great Plains, with Prairie Peninsula radiating north and east into Indiana and

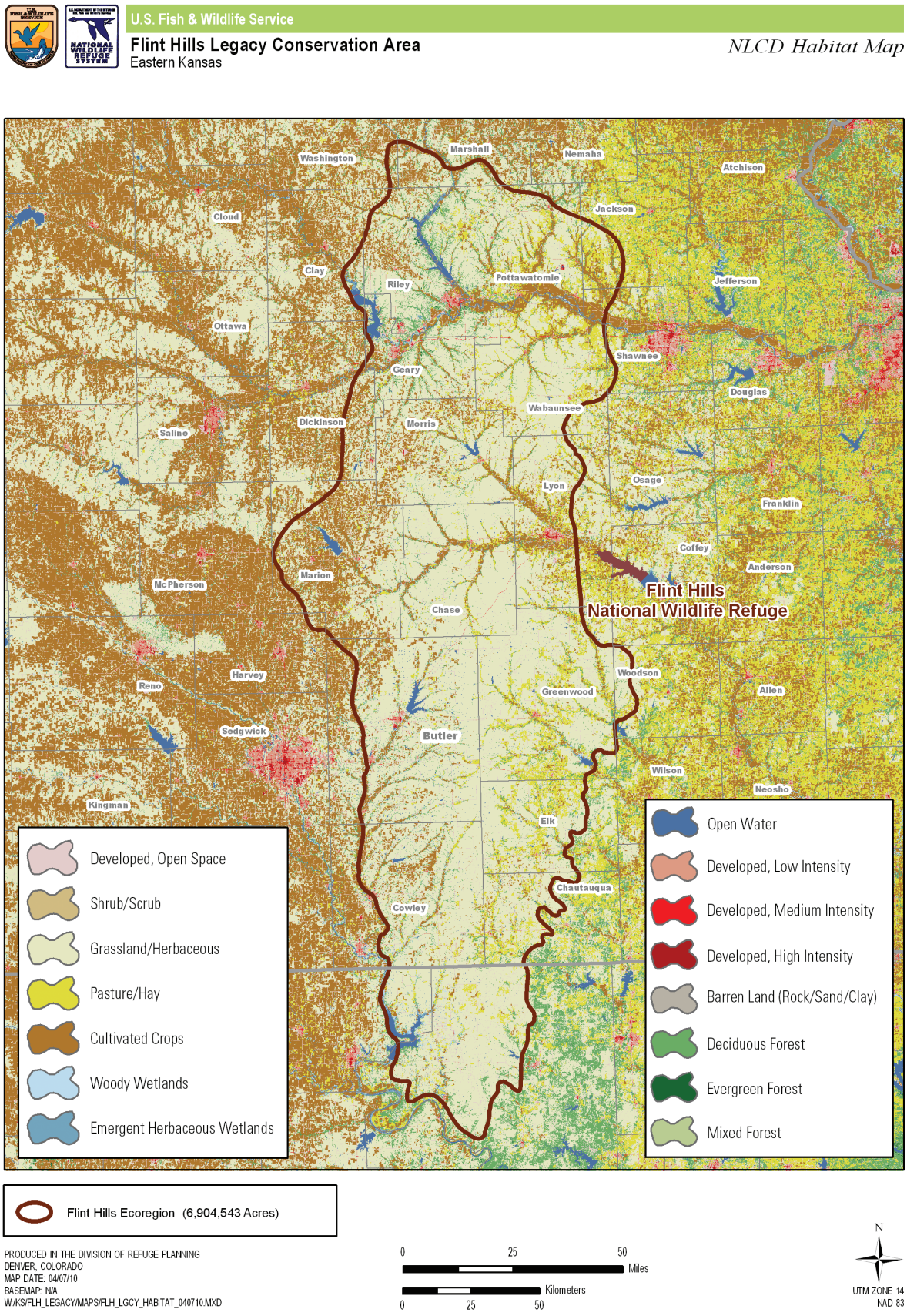

Figure 3. Land cover and habitat types in the Flint Hills Legacy Conservation Area.

Ohio during Pleistocene interglacials (Samson et al. 1999) Tallgrass prairie is considered by ecologists as a "fire climax" system, meaning without fire the tallgrass prairie will begin to shift towards a forest environment (Heisler et al. 2003). The tallgrass prairie we know today began taking shape during the close of North America's most recent glaciation period. This glacial epic, known as the Wisconsin period, caused dramatic topographical, climatic, and ecological changes across the landscape (Axelrod 1985). Throughout this period, broad-scale climate gradients, driven by continental climate change, significantly influenced the composition, species richness, and distribution of the tallgrass prairie communities (Steinauer and Collins 1996).

With an existing fire-climax prairie in place, prehistoric man first entered the North America continent approximately 12,000 years ago (Meltzer 1989). Previously, lightning was the sole source of grassland fire ignition. It is noteworthy that the Flint Hills landscape experiences the second highest frequency per square kilometer of lightning strikes in North America (Higgens 1986). Lightning-caused fires presumably drove the region's early beginnings as a fire- and herbivore-driven plant community (Mulchunas et al. 1998). As prehistoric man gained a landscape presence, it is suggested that fire frequency and temporal occurrence shifted from summer to a fall-dominated period (Shaw and Martin 1995).

This altering of fire shaped the tallgrass eco-regional plant community for several thousands of years (Moore 1972). The advent of early Euro-American explorations, beginning with the Spanish, first penetrated the tallgrass region with members of Coronado's expedition in 1541 (Haines 1970, Roe 1970). Subsequent Native American ownership of the Spanish horse heralded great changes in their social behavior, biological success, and geographical coverage, initiating vast ecological change within the tallgrass region. An important component of this ecological change was fire, ignited for a variety of reasons, by an increasingly complex, more numerous, and more mobile Native American population. Over time, this increased use of fire is believed to have substantially accelerated an eastward expansion of the tallgrass region (Kozlowski and Ahlgren 1974, Howe 1993).

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Riders and prescribed fire.

While historical fire records are scant; they do indicate that the period between 1535 and 1890 supported a dominance of fall fires. Almost all fire records of this period are along major river systems due to the need for huntable game, fuel, and accessible water, all of which made the major rivers within the region the principal travel lanes for both Euro-American and Native American travelers of this time period (Moore 1972).

Pre-1840 fire re-occurrence rates in tallgrass prairie vary from a possible annual regime (Pyne 1982) of 2–5 times per decade (Hulbert 1976), to every 5–10 years (Wright and Bailey 1982). Cutter and Guyette (1994) suggest a 2.8 year fire interval for a Missouri savanna while Bragg (1986) and Hulbert (1976) suggest a 3–5 year pre-settlement fire interval for Nebraska and Kansas tallgrass prairie. Kelly Kindscher and Craig Freeman (Kansas Biological Survey, University of Kansas, Lawrence, Kansas, and Kansas Natural Heritage Inventory, respectively; personal communication) suggest a 3–5 year return interval for the Flint Hills ecoregion.

Historical fire-return interval loses some of its relevancy unless discussed within the context of spatial scale and temporal events across the landscape. Historical fire-grazing interaction on the Great Plains was a shifting mosaic of disturbance, including areas that were burned and grazed, along with regions that were not disturbed. As an area burned and consequently greened up over time, herbivores of all kinds would concentrate on it. This burned area, if heavily used could leave other areas with very little grazing pressure. This fire-grazing interaction would repeat itself across the landscape creating a moving mosaic across both space and time. This random disturbance pattern allowed for a diverse assemblage of species to exist simultaneously (Weir et al. 2007).

Modern era settlement and livestock usage of the Kansas Flint Hills began in the mid-1800s. During initial settlement most cattle came from Texas and were driven across open range to Kansas. Around the 1880s Kansas enacted a fence law, and within a decade the majority of the region was fenced and drive routes were blocked off, much as it exists today (Jim Hoy, historian, Emporia State University, Emporia, Kansas; personal communication). As early as 1863, cattlemen recognized that burning prairies benefited both cattle weight gains and the condition of their pastures.

In recent years, prescribed fires have largely been conducted by ranchers in the spring on an annual basis. Some ranchers have begun to use patch fires

that is more representative of historical fire regimes in the region.

Prairie Uplands

The Flint Hills landscape is most often associated with bluestem grasses and about ninety native grass species are found here, with big bluestem, little bluestem, Indiangrass, switchgrass, eastern gamagrass and sideoats grama being some of the more important species from an ecological and livestock production perspective. The 500-plus native broadleaf prairie plant species (herbaceous forbs) documented as occurring in the Flint Hills are also important, not only for maintaining the ecological health of the prairie but also for providing added forage value.

As the seasons progress, new species will flower each week from March through September. This floral diversity provides benefits such as pollen and nectar foods for a diverse assemblage of pollinators, and a seed source variable in size, shape, and amino acid complex, all spatially and temporally available across the landscape. This rich array of food choices provides a quality foraging opportunity to numerous migratory and resident trust species.

Late-season rains often give rise to luxuriant fall grasses, which in turn provide important winter thermal protection for grassland birds and offer unique water quality and quantity benefits to the region.

As a result of interactions among climate, topography, fire, and bison herbivory, the vegetative structure and composition of the prairie varied both temporally and spatially across the landscape. Thus, grassland birds evolved in an ever-changing mosaic of habitats, and as a result, bird communities were likely to have varied both temporally and spatially across the landscape.

Oak Savanna and Woodlands

Although they represent a small percentage of the total acreage of the tallgrass prairie, native oak woodlands can be found throughout the project area. Species that are most commonly associated with these areas include white oak, post oak, and black oak, with a grass component including little bluestem. Post oak occurs as a dominant tree in savannas and in forests adjacent to grasslands, and will expand into adjacent prairies in the absence of fire.

Oak trees provide cover and habitat for birds and mammals. Cavities provide nest and den sites, and leaves are used for nest construction. Oak acorns provide food for numerous wildlife species including squirrels, mice, voles, white-tailed deer, and wild turkey. Bell's vireo, Bewick's wren, loggerhead shrike, and red-headed woodpecker use this woody habitat.

Riparian Areas

The Flint Hills ecoregion, as defined by Chapman et al. (2001), contains the largest concentration of freshwater springs in Kansas (Kansas Geological Survey 2008) and is the source of the Caney, Cottonwood, Elk, Fall, Marais des Cygnes (Osage), Neosho, Verdigris, and Walnut rivers. This grassland region is drained by roughly 3,300 miles of perennially flowing streams and 14,000 miles of intermittent and ephemeral streams (USGS 1998). It boasts many of the state's most pristine surface waters (for example Dodds and Oakes 2004) and supports a rich variety of native fish and shellfish species, including the world's largest remaining populations of the federally protected Topeka shiner and Neosho madtom (Haslouer et al. 2005, Angelo et al. 2002a, 2009). Many streams in the Flint Hills currently serve as ecological "reference" systems in environmental monitoring programs administered by state and federal natural resource agencies (for example KDHE 2007). These streams approach the historical (pre-settlement) ecological condition and provide the physiochemical and biological data needed to assess changes in the state's more heavily impacted surface waters (Angelo et al. 2002b, KDHE 2008).

Wildlife

The Flint Hills prairie supports a wide variety of animal life. There are assemblages of amphibians and reptiles, fish, birds, mammals, and species of special concern in the project area. Appendix A contains the species list for the Flint Hills area.

Amphibians and Reptiles

The tallgrass prairie and stream corridors that run throughout the project area provide food and shelter for a number of terrestrial or semi-aquatic animals including salamanders, toads, frogs, skinks, lizards, snakes, and turtles.

Fish and Aquatic Species

The project area contains many of the state's most pristine surface waters (for example Dodds and Oakes 2004) and supports a rich variety of native fish (over eighty species), and shellfish, including the world's largest remaining populations of the federally protected Topeka shiner and Neosho madtom (Haslouer et al. 2005, Angelo et al. 2002a, 2009).

Protection of this tallgrass landscape is essential to sustaining these aquatic species. A number of watersheds situated in the tallgrass prairie of eastern Kansas are the last remaining strongholds for the federally endangered Topeka shiner, a small

minnow that inhabits headwater prairie streams. While the number of known occurrences of Topeka shiner populations throughout its historical range in Iowa, Kansas, Minnesota, Missouri, Nebraska, and South Dakota has been reduced by more than 80 percent, stable populations remain in many of the unfragmented prairie streams in the Flint Hills (Haslouer et al. 2005, Angelo et al. 2002a, 2009). Because the Topeka shiner is not negatively impacted by normal ranching practices, maintenance of native prairie watersheds through continued ranching, which Service conservation easements would allow, may be the best hope for long-term survival of the species.

Another federally listed species endemic to the tallgrass prairie region is the Neosho madtom, a threatened catfish found primarily in about a 200-mile stretch of the Neosho and Cottonwood rivers in eastern Kansas. Like the Topeka shiner, the Neosho madtom is dependent on healthy prairie watersheds.

Many of eastern Kansas' prairie streams also harbor diverse assemblages of freshwater mussels. Freshwater mussels are the most imperiled animal group in North America, with thirty-six species believed to have become extinct during the past century. Unfortunately, mussels in Kansas have undergone a similar trend of decline. Of the forty-eight species known to have occurred in Kansas, at least five of these are now believed to be extirpated from the state, and twenty-one species are state-listed as either endangered, threatened, or as a species in need of conservation (Brian Obermeyer, Flint Hills project coordinator, The Nature Conservancy, Topeka, Kansas; face to face meeting, 2009). While there are no federally listed mussels in Kansas, five species are classified by the Service as species of concern, and federal protection could soon be proposed for two of these—the Neosho mucket and the western fanshell—if their conservation status is further threatened. Protection of native prairie watersheds through the use of conservation easements may be one of the best defenses to preclude further listings and extirpations of aquatic mollusks in the Flint Hills.

Birds

The remaining portion of a once vast grassland provides essential habitat for numerous grassland bird species, including greater prairie-chicken, Henslow's sparrow, short-eared owl, Bell's vireo, American golden-plover, grasshopper sparrow, dickcissel, eastern meadowlark, upland sandpiper, buff-breasted sandpiper, scissor-tailed flycatcher, loggerhead shrike, Smith's longspur, Harris' sparrow, Swainson's hawk and northern harrier. Among bird species, grassland birds have shown the fastest rate of decline. Of forty-six grassland-breeding bird species, 48% are species of conservation concern nationwide, including four populations that are federally endangered. Of the forty-two grassland species with sufficient monitoring, twenty-three are declining significantly (North American Bird Conservation Initiative 2009).

Within the Flint Hills, birds require a mosaic of vegetation structure within the tallgrass prairie. The intent of the FHLCA is to maintain the contiguity of the tallgrass prairie, thus protecting it from fragmentation caused by woody encroachment or development. In large parcels of grassland habitat, bird diversity increases when grazing and fire create a mosaic of vegetation structure (Fuhlendorf et al. 2006). When fire or grazing reduce the height and density of grasses, habitat becomes more suitable for grasshopper sparrow (Vickery 1996). Conversely, a 3-year absence of fire promotes habitat for Henslow's sparrow (Zimmerman 1988). Grassland birds evolved under the combined influence of fire and grazing (Fuhlendorf et al. 2006). Those two disturbances are inseparable, interacting through positive and negative feedbacks to create a shifting mosaic of vegetation structure across the landscape (Fuhlendorf and Engle 2004). This diversity of vegetation height, structure, and location creates the heterogeneity necessary to support an entire guild of grassland birds: migrants, nesters, and wintering species. Homogenous grassland habitat, with similar vegetation height and litter depth, cannot support the entire community of grassland birds (Fuhlendorf and Engle 2004).

Several species within the Flint Hills are identified as grassland obligate birds: northern harrier, upland sandpiper, greater prairie-chicken, horned lark, Savanna sparrow, grasshopper sparrow, Henslow's sparrow, dickcissel, eastern meadowlark (Ribic et al. 2009). Researchers at Konza Prairie found low-intensity cattle grazing to positively affect upland sandpipers, grasshopper sparrows, and eastern meadowlarks (Powell 2008). Grasshopper sparrows avoid areas with extensive shrub cover, selecting areas burned within the past 1–2 years (Powell 2008, Vickery 1996). Eastern meadowlarks use habitats with taller grasses of greater density, mixed with forbs (Powell 2008).

Continuing along the spectrum of denser vegetation and greater time since disturbance, Henslow's sparrows prefer significantly greater cover of standing dead vegetation created by a 2–3 year absence of fire (Zimmerman 1988). Dickcissels select areas of tall (10–59 inches) and dense (90–100%) cover (Powell 2008). Finally, Bell's vireo nests in low-shrub vegetation within draws (Brown 1993). Although each species has different habitat needs, they share a common element—intact tallgrass prairie with a diversity of vegetation structure.

These grassland birds all require relatively large blocks of healthy tallgrass prairie at various ecological stages of succession. Project size becomes important within the context of providing adequate

numbers of suitable habitat units dispersed within the proper spatial scale, all of which are necessary to provide resilient, quality migrational and breeding habitat within the context of seasonal weather variations and the resultant plant community responses. Additionally, avian predator concerns and temporal shifts in migration further substantiate the need for large, well-dispersed areas of a mosaic of tallgrass habitat types along the entire migrational corridor for these species. The requirements of these tallgrass-dependent migrant birds make them a priority species guild for conservation management.

Important year-round avian species such as the greater prairie-chicken (a Flint Hills umbrella species) require a similar mosaic of habitat types. Specific successional stages of the tallgrass plant community are necessary for many different stages of the greater prairie-chicken's life cycle. The greater prairie-chicken requires visually open areas with short vegetation for lek displays, dense almost shrubby habitat for nesting, moderate densities for brood rearing, and dense herbaceous cover for winter thermal protection. All of these habitat stages needed by greater prairie-chickens are representative of the various size and distribution requirements for avian migrants, making the prairie-chicken a useful umbrella species for habitat conservation management decisions. Home ranges of prairie-chicken flocks may be greater than 9,900 acres during certain times of a year (Robel et al. 1970). The number of acres necessary for a genetically viable population of greater prairie-chickens varies depending on large part on the quality and juxtaposition of habitats within a given area. Suggested size for a Minnesota population located in fragmented habitat was a minimum of 1 million acres (Johnson et al. 2004).

Unlike migrant species, the greater prairie-chicken must obtain all of its requirements within the context of tallgrass prairie. This affinity for open tallgrass makes it imperative to have habitat dispersed over as large a geographical area as possible.

Mammals

Uplands and stream corridors provide habitat for many small mammals including shrews, mice, voles, pocket gophers, ground squirrels, weasels, mink, and bats. These mammals provide critical food sources for prairie raptors such as bald eagles, ferruginous hawks, northern harriers, prairie falcons, and short eared owls. In addition, big game animals such as white-tailed deer, pronghorn, and the occasional mule deer use the upland prairie habitat. Mountain lion, badger, bobcat, coyote, and red fox are examples of carnivores that occur throughout the project area.

Species of Special Concern

At the federal level, eleven Flint Hills species are listed as threatened and endangered, or are candidates for listing: these include the American burying beetle, piping plover, Topeka shiner, least tern, whooping crane, Neosho madtom, western prairie-fringed orchid, Arkansas River shiner, and the Arkansas darter, Neosho mucket, rabbitsfoot (candidates for listing). Refer to appendix A, which includes the federally listed animals documented as occurring in the project area.

CULTURAL RESOURCES

Current archaeological evidence indicates that the earliest humans, called the Paleoindians, migrated to the region at the close of the last Ice Age approximately 12,000 years ago. These people had a highly mobile lifestyle that depended on big game hunting, including mammoths and the huge now-extinct ancient bison. The hallmark of most Paleoindian sites are the beautiful but deadly spear points that are generally recovered from animal kill and butchering sites, and small temporary camps. Evidence of the Paleoindian occupation of the Flint Hills area is sparse and most often consists of isolated spear points.

There was a gradual but definite shift in the pattern of human use of the region beginning about 9,000 years ago. The changes are due to a combination of regional climatic fluctuations and an increasing population, coupled with tremendous social change and technological innovation. Although this stage, referred to as the Archaic and lasting until about 2,000 years ago, is better represented in the archaeological record than the preceding Paleo-Indian stage, the interpretation of the remains is difficult. Evidence of a greater diversity of tools and increased use of native plants is found on many sites but the remains also suggest a more localized and less mobile population.

By approximately 2,000 years ago the populations of the Flint Hills region exhibited a combination of distinctive local traits and the effects of contact with neighboring groups. This period is referred to as the Plains Woodland or Ceramic Period and lasted up to approximately 350 years ago. Along with an increasing population and regional variation came great changes and innovation, including the advent of pottery, the bow and arrow, and semi permanent dwellings. Small villages began to be established and evidence of early agriculture is found along some of the waterways.

When the Coronado expedition reached what would become central Kansas in 1541, the area was occupied by several of Native American groups. Over the next 300 years, various tribes lived in the Flint Hills region including the Pawnee, Wichita, Plains Apache, Kansa, Kiowa, and the Osage. Although many tribes moved, or were moved, in and out of the region, by the mid-1800s the influx of emigrants of European ancestry was prevalent. By the late 1870s many of the tribes had been relocated to Oklahoma.

The Service has a trust responsibility to American Indian tribes that includes protection of the tribal sovereignty and preservation of tribal culture and other trust resources. Currently, the Service does not propose any project, activity, or program that would result in changes in the character of, or adversely affect, any historical cultural resource or archaeological site. When such undertakings are considered, the Service takes all necessary steps to comply with section 106 of the National Historic Preservation Act of 1966, as amended. The Service pursues compliance with section 110 of the act to survey, inventory, and evaluate cultural resources.

SOCIOECONOMIC ENVIRONMENT

The project area includes portions of twenty-one counties; Butler, Chase, Chautauqua, Clay, Cowley, Dickinson, Elk, Geary, Greenwood, Harvey, Jackson, Lyon, Marion, Marshall, Morris, Pottawatomie, Riley, Shawnee, Washington, Woodson, and Waubansee. A number of small communities are within the project area, mostly located adjacent to Highway I-35 and the eastern portion of I-70. Some of the largest communities in the state are immediately adjacent to the project area. Wichita has a population of over 366,000, Kansas City 142,562, and Topeka 123,446. Over 2.8 million persons live in the state of Kansas (U.S. Census Bureau 2009). Although there are several large communities adjacent to the FHLCA, the economy of the project area is tied to ranching and agriculture.

The strong agricultural tradition in Kansas has been contributing to the economies of small towns and the state's overall well-being since before statehood. Known as "cow towns," many towns in Kansas were dependent on the large cattle drives of the mid- and late-eighteenth century. As the drives changed and eventually disappeared, these cow towns had to change their economic base to survive—towns such as Abilene and Dodge City had to reinvent themselves. Though not totally dependent on the cattle industry now, many towns still rely on the economics of the industry. The grasslands of the Flint Hills provide summer grazing grounds that provide cattle to the numerous feed lots in other portions of Kansas.

The importance of the Flint Hills to the cattle industry cannot be overstated. The Flint Hills grasslands provide cattle to the feedlots that supply the processing facilities, thus supporting a state-wide cattle industry. With Kansas ranking second in cattle and calves, the Flint Hills plays a major role in the $6.24 billion cattle industry in Kansas, processing over 22% of all beef in the United States (Kansas Department of Agriculture 2010). The Flint Hills ranchers' livelihood depends on natural resources (grass, water, and open space) and these ranchers have a deep-rooted attachment to the land.

Unlike many other areas in the country, the key to protecting the tallgrass prairie lies primarily in sustaining the current land use pattern of livestock ranching and the use of prescribed fire.

Reasonably foreseeable actions are actions and activities that are independent of the conservation area proposed action but could result in the cumulative or additive effects when combined with the proposed alternatives. They are anticipated to occur regardless of which alternative is selected. The cumulative effects of these activities are described in the "Cumulative Impacts" sections in chapter 4. Energy development (oil and gas, and wind) and residential development, and future prairie conservation efforts by a variety of organizations are the primary, reasonably foreseeable actions occurring in the Flint Hills region and are also discussed in chapter 4.

Landownership

More than 98 percent of the property within the project boundary is in private ownership. Many Flint Hills properties are in the possession of absentee landowners, with ranch managers controlling the day-to-day operations.

Property Tax

Currently, landowners pay property taxes on their private lands to the counties. Since the proposed project is a conservation easement program, the land does not change hands and, therefore, the property taxes paid by the landowner to the county are not affected. Kansas property taxes are based on agricultural value, and as easements will not affect the agricultural value of the property, no changes to the tax base are anticipated.

Public Use and Wildlife-dependent Recreational Activities

Visitors to the Flint Hills are attracted by opportunities for bird and other wildlife viewing, nature photography, canoeing, fishing, hunting, wildflower touring, hiking, and horseback riding.

The 2006 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation found that $5.58 million were spent in Kansas on equipment and various trip-related expenditures for hunting and fishing. An additional $1.56 million was spent on food, lodging, and various equipment used for wildlife watching. In 2008, the sale of hunting and fishing licenses alone in Kansas generated approximately $10.8 million in revenue (Kansas Department of Revenue 2008).

There is increasing interest in developing agri-tourism opportunities in the Flint Hills. Many tourists travel on the Native Stone Scenic Byways and Flint Hills Scenic Byway located within the project area.

4 Environmental Consequences

This chapter assesses the environmental impacts expected to occur from the implementation of alternatives A or B, as described in chapter 2. Environmental impacts are analyzed by issues for each alternative and appear in the same order as discussed in Chapter 2.

EFFECTS ON THE BIOLOGICAL ENVIRONMENT

This section describes the estimated effects on wildlife habitat and water and soil resources of carrying out alternatives A and B.

Wildlife Habitat—Alternative A (No Action)

Current Service programs such as Partners for Fish and Wildlife (PFW) would continue within the conservation project area. The Service would continue to work cooperatively with landowners to voluntarily improve habitat on private land.

Although efforts by the Service's PFW program and partners would continue to enhance habitat on some private lands, degradation of resources on many unprotected lands would continue. These potential impacts could result in the further decline of migratory birds, resident wildlife, and listed species. Wildlife species, particularly grassland birds, would continue to decline due to habitat fragmentation resulting from intensification of agricultural processes, conversion to forest cover, or residential and commercial development. Stream quality could be become degraded from development, impacting the Topeka shiner, Neosho madtom, and mollusk species.

Subsequent effects, including those listed below, would likely impact wildlife:

- Fragmentation of habitat and loss of migration corridors for wildlife
- Reduction or elimination of grazing and prescribed fire used to maintain intact tallgrass prairie
- Increased non-native and invasive species

Habitat Fragmentation

Habitat fragmentation can be defined as a "landscape-level process in which a specific habitat is progressively sub-divided into smaller, geometrically altered, and more isolated fragments as a result of both natural and human activities, and this process involves changes in landscape composition, structure, and function at many scales and occurs on a backdrop of a natural patch mosaic created by changing landforms and natural disturbances (McGarigal and McComb 1999)."

Habitat loss and fragmentation is the greatest threat to the Flint Hills tallgrass ecosystem, and is much more likely to occur under this alternative. Fragmentation is primarily caused by commercial, industrial, and residential development, which reduces the use of prescribed fire and results in the encroachment of trees. Habitat loss and fragmentation may also act synergistically with climate change and other factors to magnify deleterious effects to species and ecosystems by limiting the ability of species to adapt or migrate (Hill et al. 2006, Ewers and Didham 2006). Habitat loss and fragmentation are considered the most significant threat to global biodiversity, with infrastructure development playing a key role (Wilcove et al. 1998).

Flint Hills grassland species are dependent on open expanses of intact tallgrass prairie habitat. As a non-migratory bird species, the greater prairie-chicken must be able to meet all life requirements within a relatively limited area of prairie, and are therefore useful as an umbrella species for evaluating habitat for other grassland bird species. Habitat requirements of prairie-chickens are thought to magnify the impact of fragmentation and other agents of habitat change (Leitner et al. 1991, Knick and Rotenberry 2000), and declining grouse populations have been linked to broad spatial landscape changes (Woodward et al. 2001, Fuhlendorf et al. 2002). Patten et al. (2005) suggested that landscape fragmentation would result in a need for greater home range size for greater prairie-chickens, which could decrease survivorship due to increased predation, collisions, and energy expenditures. It is essential to maintain contiguous habitat for the maintenance of prairie grouse populations in order to provide connectivity of multiple leks (Woodward et al. 2001); as much as 15,000 acres is required to support a single prairie-chicken lek (Hagen and Giesen 2005). Intact grassland habitats like the Flint Hills may not be able to sustain prairie-chicken and other grassland-interior specialist species if fragmentation goes unchecked.

A 6-year study in southwestern Kansas found that lesser prairie-chickens strongly avoid certain anthropogenic features, resulting in sizable areas of habitat being rendered less suitable (Pitman 2005, Robel et al. 2004). Similarly, Braun et al. (2002) found that greater sage-grouse abandoned portions of their habitats affected by oil production activity, including areas adjacent to regularly traveled oil field service roads. Edges of habitat caused by roads may create an avenue for predators and the spread of invasive weeds (Hansen and Clevenger 2005, Lockwood et al. 2007). Robel et al (2002). Observed mean avoidance buffers (mean distances based on 90% avoidance by 187 nesting lesser prairie-chicken hens) of 1,191feet from transmission lines, 581 feet from oil or gas wellheads, 4,114 feet from buildings, 1,007 feet from center pivot irrigation fields, and 2,579 feet from either side of improved roads (95 feet from 2-track ranch trails) were measured. Likewise, 18,866 radio telemetry locations of lesser prairie-chickens revealed strong avoidance behavior (95% absence ratio) from human intrusions; for example, prairie-chickens avoided buildings and transmission lines by mean distances of 1,978 and 2,081 feet, respectively. Large arrays of turbines may also serve as a barrier to birds (Drewitt and Langston 2006), potentially altering migratory corridors, local flight paths, and immigration and emigration among populations. The disturbance of tall foreign structures and noise may also disrupt mating vocalizations. Lesser prairie-chicken vocalizations, for example, are high frequency (approximately 750 Hertz) and antiphonal, and thus are easily drowned out by peripheral noise (Bain and Farley 2002). Braun et al. (2002) reported that Gunnison and greater sage-grouse were particularly susceptible to noise near leks.

Many more acres of land would likely be developed for residential home sites or isolated commercial uses, as economic forces change in the future. The project area has more than 3,000,000 privately owned acres, with the majority remaining in large ranch ownership. Under Kansas state law, the subdivision process is not difficult. Moreover, with no county zoning in place, small lot subdivisions are possible. The Flint Hills prairie is essentially surrounded by urbanized areas and areas of commercial development. Residential development around Wichita, Topeka, Manhattan, and Emporia has been claiming thousands of acres of tallgrass prairie annually. Long-time family ranches are beginning to be sold and are commanding high prices for residential properties.

Habitat and travel corridors for key geographic and functional biological linkages can be lost, and wildlife populations isolated, once an area is fragmented by subdivisions or other development. Studies have shown that an increase in urbanization and associated fragmentation has a negative effect on the abundance of grassland nesting birds. In one study, all species of song birds reviewed decreased with an increase in urbanization. For two species, the horned lark and Savanna sparrow, no birds were observed in plots where 4–7% of the surrounding landscape was urbanized, suggesting a high sensitivity to urbanization and associated fragmentation of habitat. Grasshopper sparrows declined abruptly in abundance at approximately 10% urbanization (Bock et al. 1999).

Additionally, human settlement results in the introduction of trees which spread and provide habitat for non-native perching birds which exacerbate the rate of spread. Woody species, such as the red cedar, have been increasing in the Flint Hills since around 1970 (Smith et al. 1978). Research has shown that the increase in woody species is a result of reduction in the use of fire, along with human population growth and resultant land fragmentation (Hoch 2000). Habitat loss, fragmentation, and the resulting genetic isolation constitute the most serious threats to grassland biological diversity. These factors have been repeatedly shown to decrease species richness. Ecologists use two theoretical frameworks to explain this phenomenon: the theory of island biogeography and metapopulation dynamics. The relationship of fragmentation and lost diversity holds especially true in grassland ecosystems, where many grassland interior specialists, such as the prairie-chicken, require large expanses of relatively unfragmented habitat. (Brian Obermeyer, Flint Hills project coordinator, The Nature Conservancy, Topeka, Kansas; personal communication).

Wind power offers an emission-free source of electricity and lacks many of the environmental hazards associated with fossil fuels (Therkelsen et al. 1998). However, impacts to grassland-dependent wildlife habitat resulting from wind infrastructure are of particular concern in the Flint Hills due to the high potential for wind energy development. Development of wind power poses a high risk of habitat fragmentation for the Flint Hills because economically viable wind resource areas and conservation priority areas show a high level of geographic congruence.

Red cedar invasion of prairie.

Prairie-chickens are prairie-interior specialists, exhibit high site fidelity, require extensive grasslands and open horizons (Giesen 1994, Fuhlendorf et al. 2002), and are thought to be especially vulnerable to wind energy development. Robel (2002) predicted utility scale (1.5 megawatt) wind turbines would create an approximate 1-mile radius avoidance zone for greater prairie-chicken nesting and brood rearing activities. Based on this estimate, he projected that a proposed 100 megawatt wind facility in the Flint Hills of Kansas would render 15,000–17,990 acres of very good to excellent tallgrass prairie habitat unsuitable for nesting and brood-rearing purposes; the actual project size of this proposed project was roughly half this area.

Other Fragmentation Issues

Today's Flint Hills tallgrass prairie landscape is considered by ecologists to be a "fire climax" system. When tallgrass prairie remains unburned for ten or more years it begins to convert to woodlands (Abrams and Gibson 1991) and will become unsuitable habitat for the many grassland species currently associated with the tallgrass prairie region.

With the currently increasing encroachment of residential and commercial development, and fragmentation by road networks it is becoming much more difficult to use the combination of prescribed fire and grazing necessary to maintain a healthy mosaic of tallgrass prairie habitat in a fire climax ecosystem like the Flint Hills. Increased development could make prescribed fire activities more difficult to implement, allowing tree encroachment in the surrounding areas around these developments.

No action would result in loss of opportunity to protect important tallgrass prairie and riparian habitats. Without the protection of private land with conservation easements, the future of tallgrass habitat for wildlife in the project area would be uncertain. The increased likelihood of development in the Flint Hills under alternative A, and the resultant fragmentation, would further exacerbate grassland bird declines and ultimately speed the listing of grassland-dependent species.

Wildlife Habitat—Alternative B (Proposed Action)

Through the proposed conservation easement program, up to 1,100,000 acres of privately owned native tallgrass prairie habitat would be added to the approximately 35,000 acres within the project area that already have some level of protection through the efforts of other conservation organizations. The Service would work with other agencies and organizations seeking tallgrass prairie habitat conservation. This would have long-term positive impacts on wildlife habitat and result in the long term conservation of migratory birds, threatened and endangered species, native plants, and the overall biological diversity of the Flint Hills tallgrass prairie. Through the PFW program, the management practices on easement lands could potentially be improved to provide better tallgrass prairie habitat for grassland species.

Habitat Fragmentation

Establishing the Flint Hills Legacy Conservation Area would provide for the conservation of up to 1,100,000 acres of the only remaining landscape-scale expression of tallgrass prairie. This program would provide protection and prevent the fragmentation of essential tallgrass habitat, and prairie-dependent resident and migratory wildlife species.

Under the proposed action, areas with FHLCA conservation easements would not permit commercial and industrial-scale development, including wind energy development, new residential, oil and gas developments, or commercial aggregate extraction projects on easement lands due to the serious fragmentation effects on grassland species associated with these types of activities and their associated infrastructure (wind towers, roads, and transmission lines). Perpetual conservation easements would restrict new development in order to prevent the resultant habitat fragmentation, and thereby protect key biological linkages, facilitate wildlife movement, and provide for wildlife habitat requirements. Additionally, the use of conservation easements would support management activities such as prescribed fire, grazing, and other efforts to control the spread of woody vegetation and invasive weeds. Retaining large, unfragmented areas would also greatly reduce potential for human–wildlife conflicts.

Because the conservation area currently benefits from minimal habitat fragmentation, the project seeks to retain the intact status of the habitat. The habitat loss and fragmentation from roads, power lines, turbines, and other associated infrastructure that is probably the most pressing issue for wind projects sited in relatively intact, natural landscapes (Kuvlesky et al. 2007, McDonald et al. 2009) would be greatly reduced in the project area under this alternative.

The Service supports the development of renewable energy (see Secretarial Order 3285) in areas that have minimal impacts to the trust wildlife resources on *public* lands. However, available research shows the grassland interior species of the Flint Hills to be especially vulnerable to infrastructure from various forms of development. Service Interim Guidance on Avoiding and Minimizing Wildlife Impacts from Wind Turbines (USFWS 2003) recommends avoiding "placing turbines in habitat known to be occupied by prairie grouse or other species that exhibit extreme avoidance of vertical features or structural habitat

fragmentation. In known prairie grouse habitat, avoid placing turbines within 5 miles of known leks." While wind turbines may be compatible with some wildlife species in other areas of Kansas, the Flint Hills tallgrass prairie dependent species have demonstrated sensitivity to vertical structures and habitat fragmentation.

Compatible agricultural practices such as livestock grazing, prescribed burning, and haying would continue, while sod busting (breaking of native grassland) would be prohibited. Easements would maximize the connectivity with other protected grasslands and decrease the negative impacts of habitat fragmentation on grassland birds.

For easements that have been put in place on land where the owner has not sold or leased the mineral or subsurface estates (oil and gas deposits), the U.S. Fish and Wildlife Service easement would be senior to any subsurface interests later acquired by a developer. Since development of the mineral estate could significantly impact the resources the Service is attempting to protect, the Service would require a developer to access minerals from off-site. Surface occupancy of the easement for mineral development would be prohibited.

In many places where the subsurface estate has been severed, including along the Flint Hills, the landowner does not own the subsurface rights; this means that the easement that the Service acquires from the landowner is subject to the outstanding mineral rights. In those cases, the Service would work on a voluntary basis with the developer to minimize surface degradation and would seek restoration of disturbed sites.

Conserving the unfragmented nature of North America's interior grassland habitats, which have steadily become more fragmented by a variety of human-induced influences (Samson and Knopf 1994, Knopf and Samson 1997), is essential for the long-term conservation of grassland-dependent wildlife.

The Flint Hills region provides habitat integral to larger national conservation efforts. The region is a north-south migration linkage for many migratory birds. Wildlife species dependent on tallgrass habitat are being increasingly compressed into a shrinking ecosystem, a factor contributing to the rapid decrease of grassland birds; the fastest declining of all of the North American bird guilds. Intact, open landscapes are essential habitat components for the greater prairie-chicken and other grassland birds that are the umbrella species for this project. These open landscapes are also essential for the viability of ranching communities in the Flint Hills, and in turn provide habitat at the scale necessary for grassland interior specialists.

Establishing the Flint Hills Legacy Conservation Area would provide for the conservation of up to 1,100,000 acres of important tallgrass habitat on private land. This program would help maintain the intactness of the Flint Hills tallgrass prairie region and complement conservation efforts of Ranchland Trust of Kansas, Tallgrass Legacy Alliance, Kansas Land Trust, The Nature Conservancy, KDWP, and other federal and state agencies.

Other Fragmentation Issues

Conservation easements within the Flint Hills Tallgrass Legacy Conservation Area would help reduce habitat fragmentation resulting from a lack of fire and encroachment by woody species. Key biological linkages that facilitate wildlife movement and provide for wildlife habitat requirements would be maintained. The conservation of large, unfragmented blocks of tallgrass prairie would allow the continued use of prescribed fire to maintain healthy habitat. In particular, patch or rotation burning provides the mosaic of habitat conditions required by grassland birds.

One of the greatest threats to the tallgrass region is forestation due to fire suppression. Fire also maintains overall prairie health and in turn promotes heterogeneity, a precursor to biodiversity. Maintaining fire in the Flint Hills would be maintained through objective, voluntary management in this alternative.

Water and Soil Resources—Alternative A (No Action)

The prospect of residential development in the Flint Hills area represents a potentially significant threat to the aquatic habitat. Sewage-derived nutrient additions to streams could have detrimental effects on the aquatic ecology (Wernick et al. 1998). Housing developments can also result in water diversion, and introduction of invasive species. Development could also change drainage patterns or rate of surface runoff, increasing soil erosion and nonpoint source pollution.

As demand for potable water increases for new subdivisions, water rights could be questioned and challenged to a greater extent in the future. Groundwater aquifers would receive more demand, resulting in potential degradation to the hydrology of some wetland areas.

Conversion of grasslands to cropland has been documented to increase sedimentation and pesticide runoff into wetlands. Tillage increases the sediment load into wetlands when compared to grasslands (Gleason and Euliss 1998, Kantrud et al. 1989), primarily due to wind erosion (Natural Resources Conservation Service 1992).

Carbon Sequestration Effects

Although eastern red cedar forests may provide strong regional carbon sinks, these sinks are vulnerable to significant losses through volatilization in fire, as well as losses through soil erosion caused by reduced herbaceous cover in these forests.

Water and Soil Resources—Alternative B (Proposed Action)

Water resources on up to 1,100,000 acres would be protected from increased non-point source pollution from residential subdivision, commercial development, increased erosion, and draining of wetlands, all of which are prohibited under the proposed easement program.

Compatible agricultural practices such as livestock grazing or haying would continue, while sod busting would be prohibited. The landowner would continue to own and control water rights.

Carbon Sequestration Effects

Carbon sequestration is cited as a goal of the USFWS Action Plan for Climate Change (USFWS 2009). Tallgrass prairie is well known for its ability to store carbon within soils. In addition, research at Konza Prairie identifies tallgrass prairie as a carbon sink under elevated CO_2 concentrations (Williams et al. 2004). Therefore, conservation of the Flint Hills grasslands would not only ensure the storage of existing soil CO_2, but also provide a place for future sequestration if atmospheric CO_2 concentrations increase. Some studies have indicated under conditions of elevated levels of CO_2 carbon is stored in greater proportions belowground and productivity increases in plant systems like the tallgrass prairie found in the Flint Hills (Canadell et al. 1996, Williams et al. 2004). Grasslands store the majority of carbon within the soil, whereas forests hold the greatest abundance of carbon in aboveground biomass. While projects that sequester carbon through reforestation receive much attention, equal attention should be focused on retaining carbon that is currently stored in soils.

EFFECTS ON THE SOCIOECONOMIC ENVIRONMENT

This section describes the estimated effects of alternatives A and B on landownership, land use, public use, development (including oil and gas, wind energy, and residential), and intact ecosystems values.

Landownership and Land Use—Alternative A (No Action)

More than 90 percent of the Flint Hills prairie would remain in private ownership. Ranching opportunities could be reduced when landowners begin to split tracts into smaller lots for residential and commercial development. However, landowners that subdivide could increase their revenue by developing recreational home sites. With subdivision, tracts could potentially increase in value if there is desire to cluster housing or to keep open space for future housing developments.

The community would lose open space and the aesthetics of the tallgrass prairie, and the stunning scenic vistas would be diminished.

Landownership and Land Use—Alternative B (Proposed Action)

The easement program would maintain the aesthetics of the tallgrass prairie while providing protection of trust resources through conservation of wildlife habitat and protection of land from surface disturbance or development, and fragmentation.

In 2006, the Outdoor Industry Foundation reported that wildlife and bird watching contributed $730 billion annually to the United States economy, with an estimated 66 million American participating in wildlife viewing (Southwick Associates 2007).

The proposed action would only affect lands on which the Service has acquired a conservation easement. The location, distribution, and sale of development rights by landowners on adjacent lands without Service easements would not be affected. Ongoing, traditional agricultural uses such as livestock grazing would allow ranching to continue on easements. This alternative would maintain open space on a large landscape scale, thereby preserving the rural lifestyle and associated tourism and economic activities of the area. The purchase of an easement would not result in a transfer of land title, and private landowners would continue to pay property taxes.

Positive effects may occur from increased public wildlife viewing, tourism, fishing, and hunting opportunities. Open space also may enhance property values on adjoining lands as people begin to seek out undeveloped lands in the future.

In addition, maintaining intact tallgrass prairie habitat would provide “ecosystem services” that are often unrecognized, or considered “free” (for example pollination, water purification, nutrient cycling, carbon sequestration, soil conservation, and control of pest insect populations by birds) that would not be

provided in areas that have undergone residential or commercial development.

The easement program would have no effect on tribal jurisdiction or tribal rights because it is outside of reservation lands and deals only with private landowners willing to sell an easement.

Public Use—Alternative A (No Action)

The Service would not purchase conservation easements, and landowners would manage public use.

Public Use—Alternative B (Proposed Action)

Conservation easements purchased on private tracts would not change the landowner's right to manage public access to their property.

Under the proposed easement program private landowners would retain full control over their property rights, including allowing or restricting hunting and fishing on their lands.

Development—Alternative A (No Action)

The incremental increases in infrastructure construction resulting from commercial (oil and gas, wind) and residential development in the Flint Hills will likely result in the fragmentation of habitat currently used by grassland-dependent wildlife. Over the long-term, the combined effect of these activities will likely result in the continuation, and possibly the acceleration, of the decline of grassland bird populations.

Over time, subdivision and development would reduce agri-tourism, hunting, and wildlife observation opportunities, resulting in diminished economic benefits associated with these activities to local communities.

Those landowners and the surrounding communities would lose open space, and the aesthetics of the wide open vistas in the conservation area would diminish with the anticipated increase in development. Development could reduce tourism, hunting, and wildlife observation opportunities, and diminish revenue associated with these activities to local communities.

Oil and Gas Exploration and Development

Oil and gas development would continue to occur on private lands in the Flint Hills. Stipulations to protect the surface estate would be governed by existing state regulations.

Wind Energy Development

The Flint Hills Conservation Area project would remain in private ownership, having no additional Service restrictions. Landowners could potentially profit by allowing wind energy development infrastructure to be developed on their land.

Residential Development

During the 1960s, demographers documented that, for the first time in American history, higher proportions of people were leaving cities for rural areas than were making the return trip (Fuguitt 1985). Residential development and subdivision tend to fragment wildlife habitat, and generally increase the costs to county governments that have to provide services to rural subdivisions.

Development—Alternative B (Proposed Action)

The proposed alternative will protect up to 1.1 million acres of tallgrass prairie from the combined effects of various future development activities by precluding surface occupancy, and the resultant infrastructure from fragmenting tallgrass habitat. The Service's proposed FHLCA is the only presently known action of similar scope and scale that is seeking landscape-scale conservation of the tallgrass prairie in the Flint Hills.

Ongoing, traditional agricultural uses such as livestock grazing would allow ranching to continue. This alternative would maintain open space on a large landscape scale, thereby preserving the rural lifestyle of the area.

Oil and Gas Exploration and Development

The proposed easement program would preclude oil and gas exploration or development requiring surface occupancy on easement land. Typically, conservation easements do not affect subsurface estates (oil and gas deposits) because the Service only acquires rights associated with surface ownership. In many places where the subsurface estate has been severed from surface ownership, including along the Flint Hills, the landowner does not own the subsurface rights; and this means that the easement that the Service acquires from the landowner is junior to the subsurface rights.

For easements that have been put in place on land where the owner has not sold or leased the mineral or subsurface estates (oil and gas deposits), the U.S. Fish and Wildlife Service easement would be senior to any subsurface interests later acquired by a developer. Since development of the mineral estate could significantly impact the resources the Service is attempting to protect, the Service would require a developer to access minerals from off-site. Surface occupancy of the easement for mineral development would be prohibited.

Wind Energy Development

The easement program would enhance the protection of tallgrass prairie-dependent wildlife species through conservation of wildlife habitat and protection from surface disturbance or development of wind energy infrastructure, while providing some financial compensation to landowners through the sale of easements, to offset some of the potential revenue loss from the sale of wind energy development leases.

The project will only affect lands on which the Service has acquired a conservation easement. Location and distribution on adjacent lands without Service conservation easements will not be affected. Over 89% of Kansas has the potential for the development of wind energy (National Renewable Energy Lab 2010) most of which (over 45 million acres) would still be available for development under the proposed alternative.

Residential Development

Preventing subdivision and development could decrease future tax revenues in a defined market area. However, open space could actually provide a net savings to local governments when compared to the revenues generated and costs of services associated with residential development (Haggerty 1996).

Value of Intact Ecosystems—Alternative A (No Action)

Under the no action alternative, the threat of grassland fragmentation will continue unabated. Landowners may continue to face economic pressures to subdivide their ranches. Tree encroachment and urban fragmentation will compress the Flint Hills region, leaving fewer larger parcels of tallgrass prairie.

Value of Intact Ecosystems—Alternative B (Proposed Action)

Under the proposed action, the Flint Hills grasslands would remain intact, continuing to provide ecosystem goods and services to landowners and local communities. Ecosystem services include: soil erosion control, water supply, hay production, biodiversity, and carbon sequestration. Researchers have attached dollar values to the ecosystem services provided by the grasslands of the Great Plains (Dodds et al. 2008). Overall, the native grasslands of the Great Plains produce $1,189 billion per year of ecosystem goods and services. Compared to other habitat types in the United States (eastern forests, deserts, wetlands), Great Plains grasslands have substantial value because of their significant acreage and their high quality (Dodds et al. 2008).

Great Plains grasslands stand out in other ways as well. Compared to other terrestrial ecosystems, grasslands provide the highest commodity value because of hay production. In addition, they show high economic value for biodiversity, due to the abundance of insect pollinators (Dodds et al. 2008). Beneficial insects from grasslands can provide pollination services to surrounding agricultural crops.

More locally, Kansas State Research and Extension conducted a watershed protection strategy for the Neosho River headwaters, most of which originates in the Flint Hills. The models for erosion control make comparisons between urban, cropland, and grassland cover types. Intact grassland provides a 95% reduction in soil erosion when compared to other cover types (Kansas State University Research and Extension 2009). This ecosystem service retains soil productivity and improves water quality for surrounding communities.

The proposed action would help protect valuable ecosystem services as shown in figure 4. Furthermore, it would prevent the prohibitively high cost of restoration.

UNAVOIDABLE ADVERSE IMPACTS

Any adverse effects that may be unavoidable while carrying out alternatives A and B are described below.

Alternative A (No Action)

The adverse impacts of degradation and habitat fragmentation would be expected to be more widespread and prevalent in the project area.

Alternative B (Proposed Action)

No direct or indirect unavoidable adverse impacts to the environment would result from the selection of alternative B. The easement program would not result in unavoidable adverse impacts on the physical or biological environment. The selection of an approved boundary would not, by itself, affect any aspect of landownership or values.

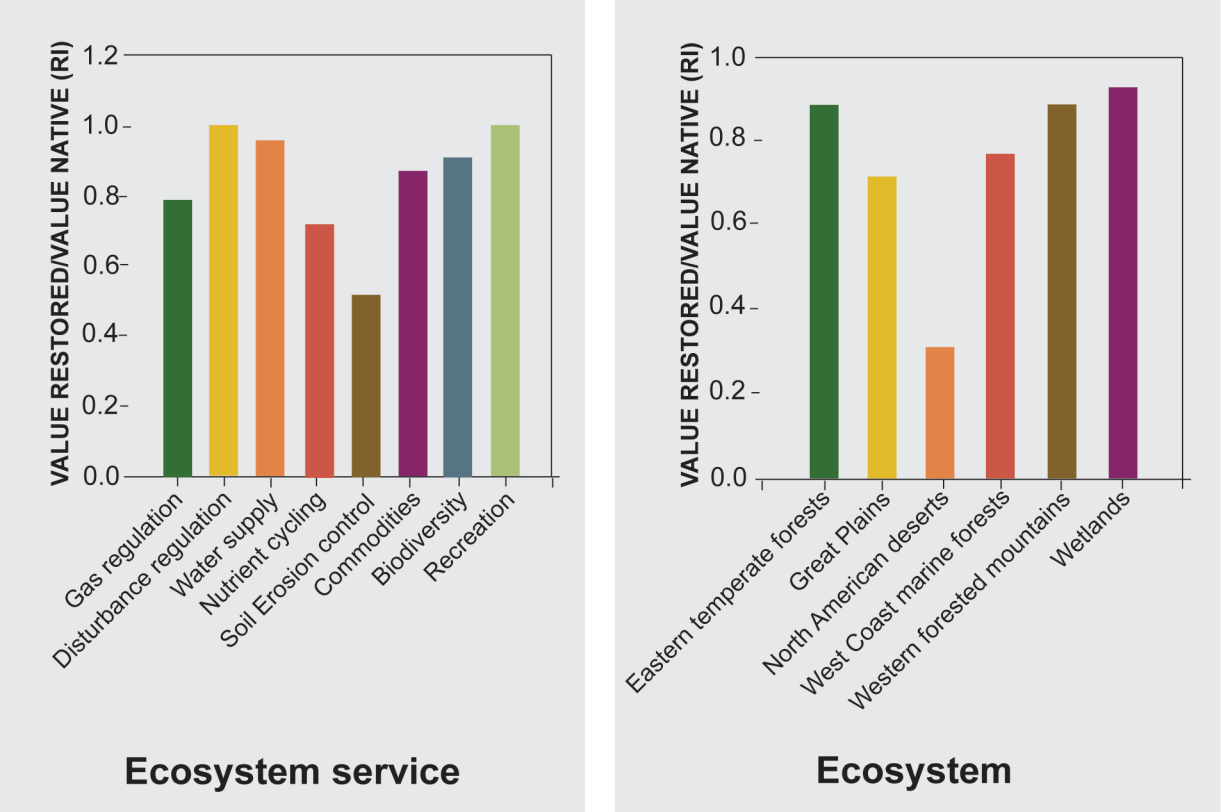
IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

Any commitments of resources that may be irreversible or irretrievable as a result of carrying out alternatives A and B are described as follows.

Alternative A (No Action)

There would be no additional commitment of resources by the Service if no action is taken.

Figure 4. Relative native and restored benefits of ecosystem goods and services.



The relative value (RI) is determined as the ratio of estimated benefits derived from native and restored acreages per year. *(Source: Dodds et al. 2008.)*

The likely introduction of new residential and commercial infrastructure to the Flint Hills tallgrass prairie would be an irretrievable loss of habitat for as long as the structures are in place. The irretrievable loss of habitat caused by the development of new residential and commercial infrastructure in the Flint Hills could eventually lead to an irreversible loss of both species and habitat.

The new infrastructure could effectively cause an irretrievable loss of habitat for tallgrass prairie bird species because of their avoidance of tall structures. With the loss of habitat some of these bird species could be pushed towards threatened or endangered status. Without other suitable habitat being available, there could be an irreversible loss of some bird species.

With new residential and commercial infrastructure development in the Flint Hills prescribed fire activity to maintain tallgrass prairie habitat could be further reduced. Without prescribed fire, tree encroachment would continue to reduce the tallgrass prairie habitat for the greater prairie-chicken and other grassland bird species, possibly leading to an irreversible loss of habitat.

Alternative B (Proposed Action)

There would not be any irreversible or irretrievable commitments of resources associated with establishing the conservation easement program. Once easements are acquired, irreversible and irretrievable commitments of funds to protect these lands (such as expenditure for fuel and staff for monitoring) would exist.

The introduction of new residential and commercial infrastructure to the Flint Hills tallgrass prairie would be greatly restricted on conservation easement lands, reducing the likelihood of an irretrievable loss of habitat associated with development. The irretrievable loss of habitat caused by the development of new residential and commercial infrastructure in the Flint Hills that would eventually lead to an irreversible loss of both species, and habitat could be minimized under the proposed action.

With the restrictions on residential and commercial infrastructure development on conservation easement lands, prescribed fire could be more easily utilized to maintain tallgrass prairie. Prescribed

fire is necessary to limit tree encroachment and to maintain tallgrass prairie habitat for the greater prairie-chicken and other grassland bird species, and to prevent an irreversible loss of habitat.

SHORT-TERM USE VERSUS LONG-TERM PRODUCTIVITY

This section describes the short-term effects versus long-term production from the expected actions in alternatives A and B.

Alternative A (No Action)

Ranches may be sold to developers for short-term gains, which would have a negative impact on the long-term biological productivity of the area.

Over the long-term, the costs to counties to sustain development in rural areas could be significant (see the "Landownership and Land Use" section on page 27). Wind energy development, and oil and gas development would provide short-term income gains, but would have a long-term adverse impact on the tallgrass ecosystem.

Alternative B (Proposed Action)

The proposed conservation easement program would maintain the long term biological productivity of the Flint Hills prairie grassland and riparian ecosystems, increased protection of endangered and threatened species, and maintenance of biological diversity.

The nation would gain the protection of tallgrass prairie species for future generations of Americans. The public would gain long term opportunities for wildlife dependent recreational activities.

USFWS

Greater prairie-chicken.

CUMULATIVE IMPACTS

Cumulative impacts are defined by NEPA policy as the impacts on the environment which result 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)

This section describes the cumulative impacts on the environment that may result from the combination of reasonably foreseeable actions in alternatives A or B, together with other biological and socioeconomic conditions, events, and developments.

Past Actions

Past land protection efforts within the Flint Hills ecoregion have included the establishment of the Tallgrass Prairie National Preserve in 1996 by the National Park Service; the U.S. Department of Agriculture Grassland Reserve Program which currently holds approximately 17,000 acres of easements; an informal moratorium on wind development by a past governor; and the acquisition of approximately 35,000 acres of conservation easements by nonprofit organizations. The PFW program has worked with private landowners to restore or enhance 349,342 acres of tallgrass prairie to date.

Present Actions

The Service's proposed action to establish an approximately (but not to exceed) 1.1 million acre conservation easement program is the only known present action of similar scope and scale for land protection in the Kansas portion of the Flint Hills ecoregion. Once approved, it will take a number of years for the program to begin to have a noticeable effect. Securing initial funding and completing real estate transactions will take time.

Reasonably Foreseeable Future Actions

Reasonably foreseeable actions are actions and activities that are independent of the conservation area proposed action but could result in cumulative or additive effects when combined with the proposed alternatives. They are anticipated to occur regardless of which alternative is selected. Energy (oil and gas, and wind) and residential development, and future prairie conservation efforts by a variety of organizations are the primary, reasonably foreseeable actions occurring in the Flint Hills region.

Oil and Gas Development

Kansas ranks among the top 10 crude oil producing states with production occurring throughout the state. In addition, Kansas also produces a substantial quantity of natural gas, and its infrastructure is a transportation hub for supplies moving throughout the country. (U.S. Energy Information Administration 2010)

Wind Energy Development

Over 89% of Kansas has been determined by National Renewable Energy Lab (NREL) to show potential for development of wind energy (National Renewable Energy Laboratory 2010). Second only to Nebraska, Kansas has extremely high wind energy potential with 47.1 million acres (190,474 km^2) available with the installed capacity of 952,371 megawatts and an annual generation of 3.7 million gigawatt-hours. The FHLCA proposed the creation of a program to acquire conservation easements on up to 1.1 million acres, which represents 0.21% of the national or 2.34% of Kansas' total wind potential.

Current estimates of windy land area and wind energy potential developed by the NREL state that approximately 517 million acres (2.092 million km^2) of land within the 48 contiguous states of the United States have an installed capacity of 10.5 million megawatts and an annual generation of 36.9 million gigawatt-hours.

Residential Development

Total land in farms in Kansas from 1969 to 2007 declined from about 49.4 million acres to about 46.3 million acres, a decrease of more than 6 percent, while the urban population in the state increased from 1.29 million people to 1.8 million people between 1980–2009 (USDA 2010). As urban areas spread into the surrounding prairie areas, the tallgrass habitat becomes increasingly fragmented by trees and buildings and roads.

Other Conservation Efforts

Ongoing efforts by a variety of organizations and agencies including TNC, RTK, TLA, Natural Resources Conservation Service (NRCS), and PFW have led to the successful conservation of approximately 35,000 acres of tallgrass prairie, and the enhancement and restoration of another 349,342 acres. Based on potential success of the proposed action in achieving land protection, it is anticipated that the Service will also consider protecting lands in Oklahoma within the Flint Hills (Osage Plains) ecoregion. The Kansas Legislature may continue to consider a large-scale moratorium on wind development within the Flint Hills. Currently, there is not a solid base for analysis, and it would therefore be speculative to try to determine any effects in relation to the proposed action. The Service does not plan additional land protection in eastern Kansas beyond existing programs at the Marais des Cygnes NWR and a smaller set of options being explored to preserve some lands along the Missouri River. Lastly, we expect nonprofit organizations to continue to be active in the Flint Hills ecoregion, but based on past experience, it is anticipated that their role will shift in part from easement acquisition to a partnership in achieving the Service's goal of protecting up to 1.1 million acres.

DEVELOPMENT—ALTERNATIVE A (NO ACTION)

The incremental increases in infrastructure construction resulting from development activities (oil and gas, wind and residential) in the Flint Hills will likely result in the fragmentation of habitat currently utilized by grassland-dependent wildlife. Over the long-term, the combined effect of these activities will likely result in the continuation, and possibly the acceleration, of the decline of grassland bird populations.

DEVELOPMENT—ALTERNATIVE B (PROPOSED ACTION)

The proposed alternative will protect up to 1.1 million acres of tallgrass prairie from the combined effects of various future development activities by precluding surface occupancy, and the resultant infrastructure from fragmenting tallgrass habitat. The Service's proposed FHLCA is the only presently known action of similar scope and scale that is seeking landscape-scale conservation of the tallgrass prairie in the Flint Hills.

CONSERVATION EFFORTS—ALTERNATIVE A (NO ACTION)

Current Service programs such as Partners for Fish and Wildlife would continue within the conservation project area. The Service would continue to work cooperatively with landowners to voluntarily improve habitat on private land.

CONSERVATION EFFORTS—ALTERNATIVE B (PROPOSED ACTION)

Through the proposed easement program, up to 1,100,000 acres of privately owned native tallgrass prairie habitats would be added to the 31,000 acres within the project area that already have some level of protection. This would have long term positive impacts on wildlife habitat and result in the long term conservation of migratory birds, threatened and endangered species, native plants, and the overall biological diversity of the Flint Hills tallgrass prairie.

5 Coordination and Environmental Review

The Service coordinated within the agency, as well as with other federal agencies and local agencies, while developing this environmental assessment. The analysis and documentation was prepared by a combination of field and regional Service staff, along with partners (refer to appendix B). In addition, the coordination effort for contaminants and hazardous materials is described below.

The Service conducted this environmental analysis under the authority of the National Environmental Policy Act. The resulting document will be distributed to the project mailing list; copies can be requested. Appendix C contains the Finding of No Significant Impact, appendix D contains the Compliance Certificate, appendix E contains the Level 1 Report, and appendix F contains the Section 7 Biological Evaluation.

AGENCY COORDINATION

The Service has discussed the proposal to establish the Flint Hills Legacy Conservation Area with landowners; conservation organizations; other federal agencies; tribal, state, and county governments; and other interested groups and individuals.

The Service held six public meetings to provide information and discuss the proposal with landowners and other interested citizens. Information on the FHLCA project has been made available to county commissioners in each of the twenty-one counties included in the project area.

At the federal level, Service staff has briefed Senators Brownback and Roberts, as well as the Congressional delegation, and coordinated with representatives from other federal agencies such as the U.S. Department of Agriculture (Natural Resources Conservation Service), Department of Defense (Fort Riley Army Installation), National Park Service, and the Environmental Protection Agency. At the state level, Governor Parkinson's staff and Kansas' State Congressional delegation, along with KDWP, were briefed on the project. In addition, the Service provided information to eleven tribes on this project.

Nongovernmental conservation groups are vital to the success of the proposed project. Service staff has coordinated with partner organizations such as The Nature Conservancy, Tallgrass Legacy Alliance, The Ranchland Trust of Kansas, and Kansas Land Trust.

Appendix G lists the comments and responses from the public review.

CONTAMINANTS AND HAZARDOUS MATERIALS

Fieldwork for the pre acquisition contaminant surveys would be conducted on a tract-by-tract basis, prior to the purchase of any land interest. Any suspected problems or contaminants requiring additional surveys would be referred to a contaminants specialist located in the Service's ecological services office in Manhattan, Kansas.

NATIONAL ENVIRONMENTAL POLICY ACT

As a federal agency, the Service must comply with provisions of the National Environmental Policy Act. An environmental assessment is required under the act to evaluate reasonable alternatives that will meet stated objectives, and to assess the possible impacts to the human environment. The environmental assessment serves as the basis for determining whether implementation of the proposed action would constitute a major federal action significantly affecting the quality of the human environment.

The analysis for, and development of this environmental assessment, facilitated the involvement of government agencies and the public in the decision-making process.

STRATEGIC HABITAT CONSERVATION AND LANDSCAPE CONSERVATION COOPERATIVES

Strategic habitat conservation (SHC) is a means of applying adaptive management across large landscapes. Landscape conservation cooperatives will facilitate strategic habitat conservation (USFWS 2008).

Strategic Habitat Conservation

The FHLCA will apply the strategic habitat conservation framework as outlined in the National Ecological Assessment Team report. SHC involves an ongoing cycle of biological planning, conservation design, conservation delivery, outcome-based

monitoring, and assumption-based research. It is also the process by which the Service continues to develop and apply science focused on improving the ability to apply conservation delivery actions which results in landscapes capable of supporting populations of priority species at desired levels. Additionally, SHC provides the framework by which the Service develops and applies science to inform and continually improve conservation delivery by addressing landscape-level population limiting factors in an adaptive manner.

The U.S. Fish and Wildlife Service Region 6 Refuges Program has co-located Habitat and Population Evaluation Team Office of Conservation Science (HAPET) staff and equipment at Flint Hills NWR to provide support for the biological planning, conservation design, conservation delivery, and monitoring/research elements of SHC necessary to implement the FHLCA project. The preparation of the Flint Hills project environmental assessment addresses the four key elements of strategic habitat conservation: planning, design, delivery, and monitoring and research.

Biological Planning

Trust resources have been described in earlier chapters of this document. Biological planning requires the identification of priority species, development of population objectives, and identification of landscape-level limiting factors keeping priority trust species populations below desired levels. Initial biological planning will be conducted using the greater prairie-chicken as a focal species. This approach is based on the assumption that delivery of grassland conservation easements targeted at minimizing and reducing population limiting factors of greater prairie-chicken will also adequately address the limiting factors of priority grassland dependent federal trust species (that is dickcissel, grasshopper sparrow, Henslow's sparrow, upland sandpiper) throughout the Flint Hills ecoregion. Conceptual and quantitative models will be developed predicting greater prairie-chicken population response to landscape-level habitat conditions to aid in initial conservation design and delivery efforts. Priority species, along with associated population goals, will continually be defined and updated throughout the implementation of this project, and additional landscape models will be developed for priority trust species.

Conservation Design

Service biologists identified and mapped the core area containing the highest quality, least fragmented tallgrass habitat within the Flint Hills of Kansas (see figure 2 in chapter 1). This remaining tallgrass prairie runs between the southern and northern borders of the state, and is as narrow as 20 miles wide, constrained on the east and west by tillage agriculture. This narrow north-south corridor reflects the shape of the remaining intact Flint Hills tallgrass. The identification of priority grasslands for inclusion in the project area was based on a conceptual model representing greater prairie-chicken response to landscape-level habitat conditions. Using a geographic information system (GIS) and existing data from the National Land Cover Database (NLCD) (Homer et al. 2007) an 800 meter moving window analysis was applied to all grassland habitat within the Flint Hills ecoregion. All areas consisting of >95% grassland were selected as potential priority areas. The selection of a 95% grassland threshold is similar to that used for development of a Grassland Bird Conservation Area (GBCA) conceptual model which was found to be very effective at identifying priority areas for some grassland birds in the Prairie Pothole Region. Applying the greater prairie-chicken conceptual model to NLCD 2001 land cover data resulted in a spatially explicit decision support tool identifying approximately 3.3 million acres of priority grassland within the Flint Hills ecoregion.

The following assumptions are associated with the conceptual model used to identify priority grasslands for the FHLCA project area:

1. The greater prairie-chicken is an appropriate focal species for other Service priority trust species in the Flint Hills ecoregion.
2. The greater prairie-chicken serves as a focal species and adequately represents habitat requirements for priority federal trust species, which are below desired population levels or declining (as measured by some population response metric such as probability of occurrence, density, survival, recruitment, or population persistence). Potential declining priority federal trust species include dickcissel, grasshopper sparrow, Henslow's sparrow, upland sandpiper, and other species that may be deemed appropriate when data are obtained.
3. The greater prairie-chicken responds to landscapes as quantified with an 800-meter radius.
4. The greater prairie-chicken show the strongest response to landscapes with >95% grassland habitat.
5. NLCD 2001 land cover data adequately represents Flint Hills landscape conditions.

New decision support tools will be developed through refinements of the greater prairie-chicken model, additions of new priority species, development of additional priority species models, setting of population objectives, and evaluations of conservation delivery through the elements of biological planning, conservation delivery, and monitoring and research. These new tools may result in challenges to currently held paradigms about the best conservation approach for target species (Reynolds et al. 2001).

Conservation Delivery

Partners for Fish and Wildlife biologists have worked for years developing partnerships that provide the foundation for a successful easement program. The ongoing involvement of the PFW program, and the many partner organizations and agencies will be essential for the effective delivery of sustainable conservation program. Application of the SHC framework will build on existing partnerships and support the development of new partnerships for delivering conservation throughout the Flint Hills ecoregion. Results from the biological planning and conservation design elements will be used to target conservation delivery, while the monitoring and research element will evaluate the effectiveness and improve conservation delivery over time. The biological planning element will engage partners in the identification of priority species, population objectives, and the development of biological models which will be directly linked to conservation delivery actions. The conservation design element will involve the development of spatially explicit decision support tools for targeting conservation delivery actions. These spatially explicit decision support tools, which can be tailored to specific treatments or locations based on the priorities and needs of different partners, will allow for greater flexibility, increased responsiveness, and improved efficiency in meeting Service and partner conservation delivery needs.

Monitoring and Research

Monitoring and research efforts for the FHLCA will use model-based approaches to measure conservation effectiveness and will focus on three key areas:

- Developing, improving, and assessing landscape models for priority trust species. Emphasis will be placed on the highest priority species with the greatest degree of uncertainty regarding limiting factors and the effectiveness of management actions at minimizing and reducing limiting factors. Data from existing surveys such as the Breeding Bird Survey will be evaluated and incorporated into spatial models. When necessary, additional data will be collected to evaluate assumptions used in the modeling process and assessments will be adjusted accordingly. These methods will provide an estimate of population response of trust species on project (easement) lands and on non-easement properties. Similar modeling approaches may be developed or incorporated for priority non-trust species (for example, greater prairie-chicken) in cooperation with partners such as nongovernmental organizations and universities.
- Evaluating assumptions and addressing uncertainties identified through the biological planning, conservation design, and conservation delivery elements. When warranted, assumptions such as increased nesting success in larger blocks of grass will be evaluated in cooperation with partners such as nongovernmental organizations and universities.
- Assessing the contribution of grassland conservation easements and other management actions toward meeting population goals for priority trust species. Spatially explicit models will allow estimation of population size on conservation easements and other land parcels of interest. This will allow the Service and conservation partners to evaluate the contribution of the program to the meeting of population goals, and to refine conservation delivery to ensure maximum efficiency. Spatially explicit models will also enable the Service to demonstrate the contribution of the FHLCA to national and continental population goals for priority species similar to how the HAPET office and cooperators have assessed the contribution of landscape-level conservation in the Prairie Pothole Region (See Reynolds et al. 2001, Reynolds et al. 2006 and Niemuth et al. 2009).

Landscape Conservation Cooperatives

The Service will use landscape conservation cooperatives (LCCs) as a means of implementing strategic habitat conservation. LCCs will be formal science and management partnerships between the Service, U.S. Geological Survey, other federal agencies, states, tribes, nongovernmental organizations, universities, and others to increase applied conservation science capacity in support of fish and wildlife management within specific landscapes (Secretarial Order Number 3289). The tools developed by the LCCs will allow Service offices, and our many partners, to implement on-the-ground actions in the most effective locations to meet their goals.

The FHLCA is part of the Tallgrass Prairie and Big Rivers LCC, which is in the process of being developed. This project meets the criteria of the LCC initiative—cooperation among private landowners and other agencies (federal, state, local, and nongovernmental organizations). In addition to fostering partnerships, these cooperatives provide science support to managers. The FHLCA will benefit from much of the science generated by the Konza Prairie Long-Term Ecological Research site. This land is owned by The Nature Conservancy, but is operated under an agreement with Kansas State University. The FHLCA would receive further science support from the Geographic Information System capacity at the Service's Ecological Services Office in Manhattan, Kansas. As a final support for the strategic habitat conservation approach to conservation, it is notable that the Flint Hills represents the largest intact tallgrass prairie within

the Geographic Framework of Bird Conservation Region #22, a treasured landscape.

The Secretary of the Interior recently outlined the importance of landscape conservation cooperatives as a response to climate change (USFWS 2009). Landscape conservation cooperatives reach across broad landscapes, involve many partners, and function at a scale necessary to address wildlife adaptation in response to climate change. The FHLCA would link existing Flint Hills conservation easement areas held by The Nature Conservancy and the U.S. Department of Agriculture. The Council Grove Wildlife Area (KDWP) also manages land within the easement boundary.

These cooperatives will continue to grow as a means of delivering strategic habitat conservation. The Service and U.S. Geological Survey signed a memorandum of understanding to strengthen the science–management relationship in landscape-level conservation. This further commitment to strategic habitat conservation improves the stature for the type of landscape conservation being proposed for the Flint Hills Legacy Conservation Area.

DISTRIBUTION AND AVAILABILITY

Copies of the environmental assessment were sent to federal and state legislative delegations, tribes, agencies, landowners, private groups, and other interested individuals.

Additional copies of the document are available from the following offices and websites.

U.S. Fish and Wildlife Service
Flint Hills National Wildlife Refuge
530 West Maple Avenue
Hartford, Kansas 66854
620/392 5553
http://flinthills.fws.gov

U.S. Fish and Wildlife Service
Region 6, Division of Refuge Planning
Branch of Land Protection Planning
P.O. Box 25486–DFC
Denver, Colorado 80225
303/236 4345
303/236 4792 fax
http://mountain-prairie.fws.gov/planning/lpp.htm

Appendix A

List of Plants and Animals

PLANTS

SCIENTIFIC NAME	COMMON NAME
Acanthaceae	**Acanthus Family**
Dicliptera brachiata	dicliptera
Justicia americana	water willow
Ruellia humilis	fringeleaf ruellia
Ruellia strepens	limestone ruellia
Aceraceae	**Maple Family**
Acer negundo	boxelder
Acer saccharinum	silver maple
Acorus calamus	calamus sweetflag
Adiantaceae	**Fern Family**
Argyrochosma dealbata	powdery cloak fern
Cheilanthes lanosa	hairy lip fern
Pellaea atropurpurea	purple cliff-brake
Pellaea glabella ssp. glabella	smooth cliffbrake
Agavaceae	**Agave Family**
Yucca arkansana	Arkansas soapweed
Yucca filamentosa	limp soapweed
Yucca glauca	small soapweed
Alismataceae	**Water Plantain Family**
Alisma subcordatum	smallflower water plantain
Alisma triviale	northern water-plantain
Echinodorus berteroi	erect burhead
Echinodorus cordifolius	creeping burhead
Sagittaria brevirostra	short-beak arrowhead
Sagittaria graminea var. graminea	grassy arrowhead
Sagittaria latifolia	common arrowhead
Sagittaria montevidensis ssp. calycina	giant arrowhead
Amaranthaceae	**Pigweed Family**
Amaranthus albus	tumbleweed amaranth
Amaranthus arenicola	sandhill pigweed
Amaranthus blitoides	prostrate pigweed
Amaranthus hybridus	slender pigweed
Amaranthus palmeri	Palmer's pigweed
Amaranthus retroflexus	rough pigweed

SCIENTIFIC NAME	COMMON NAME
Amaranthus rudis	water hemp
Amaranthus tuberculatus	tall water-hemp
Froelichia gracilis	slender snakecotton
Iresine rhizomatosa	bloodleaf
Anacardiaceae	**Sumac Family**
Rhus aromatica	fragrant sumac
Rhus copallinum	dwarf sumac
Rhus glabra	smooth sumac
Toxicodendron radicans ssp. negundo	poison-ivy
Annonaceae	**Custard-apple Family**
Asimina triloba	Pawpaw
Apiaceae	**Parsley Family**
Ammoselinum popei	plains sand parsley
Berula erecta var. incisa	cut-leaf water-parsnip
Bupleurum rotundifolium	thoroughwax
Chaerophyllum procumbens	spreading chervil
Chaerophyllum tainturieri	erect chervil
Cicuta maculata	common water hemlock
Conium maculatum	poison-hemlock
Cryptotaenia canadensis	honewort
Daucus carota	Queen Anne's lace
Eryngium leavenworthii	Leavenworth's eryngo
Eryngium yuccifolium	button snakeroot
Lomatium foeniculaceum	fennel-leaf desert-parsley
Osmorhiza longistylis	long-style sweet-cicley
Pastinaca sativa	garden parsnip
Polytaenia nuttallii	prairie parsley
Sanicula canadensis var. canadensis	Candian sanicle
Sanicula odorata	cluster sanicle
Spermolepis inermis	spreading spermolepis
Torilis arvensis	hedge parsley
Zizia aurea	golden zizia
Apocynaceae	**Dogbane Family**
Apocynum cannabinum	hemp dogbane
Vinca major	periwinkle
Vinca minor	common periwinkle
Araceae	**Arum Family**
Arisaema dracontium	green dragon
Arisaema triphyllum ssp. triphyllum	Indian Jack-in-the-pulpit
Peltandra virginica	Virginia arum
Pistia stratiotes	water lettuce
Asclepiadaceae	**Milkweed Family**
Asclepias amplexicaulis	bluntleaf milkweed

SCIENTIFIC NAME	COMMON NAME
Asclepias asperula ssp. capricornu	milkweed
Asclepias incarnata ssp. incarnata	swamp milkweed
Asclepias pumila	plains milkweed
Asclepias speciosa	showy milkweed
Asclepias stenophylla	narrow-leaf milkweed
Asclepias sullivantii	Sullivant's milkweed
Asclepias syriaca	common milkweed
Asclepias tuberosa ssp. interior	butterfly milkweed
Asclepias verticillata	whorled milkweed
Asclepias viridiflora	green milkweed
Asclepias viridis	green milkweed
Cynanchum laeve	climbing milkweed
Vincetoxicum nigrum	Louise's swallow-wort
Aspleniaceae	**Fern Family**
Asplenium platyneuron	ebony spleenwort
Asplenium resiliens	black-stemmed spleenwort
Asplenium rhizophyllum	walking fern
Asplenium trichomanes ssp. trichomanes	maidenhair spleenwort
Asteraceae	**Aster Family**
Achillea millefolium	western yarrow
Acroptilon repens	Russian knapweed
Ageratina altissima	white snakeroot
Ambrosia artemisiifolia	common ragweed
Ambrosia bidentata	lanceleaf ragweed
Ambrosia psilostachya	western ragweed
Ambrosia trifida	giant ragweed
Amphiachyris dracunculoides	annual broomweed
Antennaria neglecta	field pussytoes
Antennaria parlinii ssp. fallax	Parlin's pussytoes
Anthemis cotula	camomile
Arctium minus	common burdock
Arnoglossum atriplicifolium	pale Indian-plantain
Arnoglossum plantagineum	tuberous Indian-plantain
Artemisia ludoviciana	Louisiana sagewort
Bidens aristosa var. retrorsa	bearded beggarticks
Bidens bipinnata	Spanish needles
Bidens cernua	nodding beggartick
Bidens comosa	leafybract beggartick
Bidens frondosa	devil's beggartick
Bidens vulgata	tall beggartick
Boltonia asteroides	white doll's daisy
Brickellia eupatorioides var. corymbulosa	false boneset
Carduus nutans	musk-thistle

SCIENTIFIC NAME	COMMON NAME
Centaurea cyanus	bachelor‘s-button
Chrysanthemum leucanthemum	ox-eye daisy
Chrysopsis pilosa	soft goldenaster
Cichorium intybus	common chicory
Cirsium altissimum	tall thistle
Cirsium arvense	Canada thistle
Cirsium undulatum	wavyleaf thistle
Cirsium vulgare	bull thistle
Conyza canadensis	Canada horseweed
Conyza ramosissima	lawn horseweed
Coreopsis grandiflora	bigflower coreopsis
Coreopsis palmata	finger coreopsis
Cyclachaena xanthifolia	bur-weed marshelder
Diaperia prolifera var. prolifera	bighead pygmy cudweed
Dyssodia papposa	foetid dogweed
Echinacea angustifolia	narrow-leaf purple-coneflower
Echinacea atrorubens	Topeka purple coneflower
Echinacea pallida	pale purple coneflower
Echinacea purpurea	purple coneflower
Eclipta prostrata	yerba de tajo
Engelmannia peristenia	Engelmann’s daisy
Erechtites hieraciifolia	American burnweed
Erigeron annuus	annual fleabane
Erigeron philadelphicus	Philadelphia fleabane
Erigeron strigosus	daisy fleabane
Eupatorium altissimum	tall joe-pye-weed
Eupatorium perfoliatum	boneset
Eupatorium serotinum	late eupatorium
Euthamia gymnospermoides	viscid euthamia
Gaillardia pulchella	rose ring gaillardia
Grindelia ciliata	—
Grindelia lanceolata	spinytooth gumweed
Grindelia squarrosa	curly-cup gumweed
Helenium amarum	bitter sneezeweed
Helenium autumnale	common sneezeweed
Helianthus annuus	common sunflower
Helianthus ciliaris	texas blueweed
Helianthus grosseserratus	sawtooth sunflower
Helianthus hirsutus	hairy sunflower
Helianthus maximiliani	Maximilian‘s sunflower
Helianthus mollis	ashy sunflower
Helianthus pauciflorus var. pauciflorus	stiff sunflower
Helianthus petiolaris	prairie sunflower

SCIENTIFIC NAME	COMMON NAME
Helianthus salicifolius	willowleaf sunflower
Helianthus tuberosus	Jerusalem artichoke
Helianthus X kellermanii	—
Helianthus X laetiflorus	—
Heliopsis helianthoides var. occidentalis	smooth oxeye
Heliopsis helianthoides var. scabra	smooth oxeye
Heterotheca canescens	goldenaster
Heterotheca latifolia	broad-leaf golden-aster
Heterotheca stenophylla var. angustifolia	narrow-leaf golden-aster
Heterotheca subaxillaris ssp. latifolia	camphorweed
Hieracium gronovii	Gronovius' hawkweed
Hieracium longipilum	longbeard hawkweed
Hymenopappus scabiosaeus var. corymbosus	flat-top woolly-white
Iva annua	annual sumpweed
Krigia cespitosa	common dwarf dandelion
Lactuca canadensis	Canada lettuce
Lactuca floridana	Florida lettuce
Lactuca ludoviciana	Louisiana lettuce
Lactuca saligna	willowleaf lettuce
Lactuca serriola	prickly lettuce
Leucanthemum vulgare	common ox-eye daisy
Liatris aspera	rough gayfeather
Liatris mucronata	pointed gayfeather
Liatris punctata	dotted gayfeather
Liatris pycnostachya	thickspike gayfeather
Liatris squarrosa var. hirsuta	—
Matricaria discoidea	disc mayweed
Microseris cuspidata	prairie false dandelion
Packera plattensis	plains groundsel
Packera pseudaurea var. semicordata	false golden ragwort
Parthenium integrifolium var. hispidum	wild quinine
Pluchea odorata	purple marsh-fleabane
Prenanthes aspera	rough rattlesnakeroot
Pseudognaphalium obtusifolium	fragrant false-cudweed
Pyrrhopappus carolinianus	Carolina false dandelion
Pyrrhopappus grandiflorus	tuberous false dandelion
Ratibida columnifera	yellow prairie coneflower
Ratibida pinnata	grayhead prairie coneflower
Rudbeckia amplexicaulis	clasping coneflower
Rudbeckia hirta var. pulcherrima	black-eyed Susan
Rudbeckia laciniata	cutleaf coneflower
Rudbeckia triloba	brown-eyed Susan
Senecio plattensis	plains groundsel

SCIENTIFIC NAME	COMMON NAME
Silphium integrifolium	whole-leaf rosinweed
Silphium laciniatum	compass plant
Silphium perfoliatum	cup plant
Silphium speciosum	whole-leaf rosinweed
Solidago altissima	—
Solidago altissima var. altissima	—
Solidago canadensis var. hargeri	Canadian goldenrod
Solidago delicatula	—
Solidago gigantea	Late goldenrod
Solidago missouriensis	Missouri goldenrod
Solidago nemoralis	gray goldenrod
Solidago petiolaris	downy goldenrod
Solidago rigida ssp. rigida	stiff goldenrod
Solidago speciosa	—
Solidago ulmifolia	—
Sonchus arvensis ssp. uliginosus	—
Sonchus asper	prickly sowthistle
Symphyotrichum divaricatum	southern annual saltmarsh aster
Symphyotrichum drummondii	Drummond's aster
Symphyotrichum ericoides var. ericoides	white heath aster
Symphyotrichum hesperium	lance-leaf aster
Symphyotrichum laeve var. laeve	smooth aster
Symphyotrichum lanceolatum var. lanceolatum	lance-leaf aster
Symphyotrichum novae-angliae	New England aster
Symphyotrichum oblongifolium	aromatic aster
Symphyotrichum oolentangiense	azure aster
Symphyotrichum parviceps	Smallhead aster
Symphyotrichum patens var. gracile	spreading aster
Symphyotrichum pilosum	frost-weed aster
Symphyotrichum praealtum var. praealtum	willowleaf aster
Symphyotrichum sericeum	silky aster
Taraxacum laevigatum	red-seeded dandelion
Taraxacum officinale	common dandelion
Thelesperma filifolium var. filifolium	—
Thelesperma megapotamicum	Rio Grande greenthread
Tragopogon dubius	western salsify
Tragopogon porrifolius	oyster salsify
Verbesina alternifolia	wingstem crownbeard
Verbesina encelioides ssp. exauriculata	—
Verbesina virginica	white crownbeard
Vernonia arkansana	Arkansas ironweed
Vernonia baldwinii ssp. baldwinii	western ironweed
Vernonia fasciculata	—

SCIENTIFIC NAME	COMMON NAME
Xanthium strumarium	common cocklebur
Azollaceae	**Water Fern Family**
Azolla mexicana	Mexican mosquito fern
Balsaminaceae	**Touch-me-not Family**
Impatiens capensis	spotted touch-me-not
Berberidaceae	**Barberry Family**
Berberis thunbergii	Japanese barberry
Podophyllum peltatum	may-apple
Betulaceae	**Birch Family**
Corylus americana	American hazelnut
Ostrya virginiana	hop-hornbeam
Bignoniaceae	**Trumpet-creeper Family**
Campsis radicans	trumpet creeper
Catalpa bignonioides	common catalpa
Catalpa speciosa	catalpa
Boraginaceae	**Borage Family**
Cynoglossum officinale	common hounds'-tongue
Hackelia virginiana	Virginia stickseed
Heliotropium tenellum	pasture heliotrope
Lappula redowskii	flatspine stickseed
Lappula squarrosa	European stickseed
Lithospermum arvense	corn gromwell
Lithospermum canescens	hoary gromwell
Lithospermum incisum	plains gromwell
Myosotis verna	Virginia forget-me-not
Onosmodium bejariense var. occidentale	western marbelseed
Brassicaceae	**Mustard Family**
Alliaria petiolata	garlic mustard
Barbarea vulgaris	bitter wintercress
Boechera canadensis	sicklepod
Brassica juncea	Indian mustard
Brassica nigra	black mustard
Camelina microcarpa	small-seeded false flax
Capsella bursa-pastoris	shepherd's purse
Cardamine concatenata	toothwort
Cardamine parviflora var. arenicola	—
Chorispora tenella	blue mustard
Conringia orientalis	hare's-ear mustard
Descurainia intermedia	pinnate tansy-mustard
Descurainia pinnata	pinnate tansy-mustard
Descurainia sophia	flixweed
Diplotaxis muralis	sand rocket
Draba brachycarpa	shortpod draba

SCIENTIFIC NAME	COMMON NAME
Draba cuneifolia	wedgeleaf draba
Draba reptans	white whitlow-wort
Erysimum asperum	plains wallflower
Erysimum repandum	bushy wallflower
Hesperis matronalis	dame's rocket
Iodanthus pinnatifidus	purple rocket
Lepidium campestre	field peppergrass
Lepidium densiflorum	peppergrass
Lepidium draba	—
Lepidium oblongum	oblong pepper-grass
Lepidium virginicum	Virginia peppergrass
Microthlaspi perfoliatum	—
Nasturtium officinale	common watercress
Physaria gordonii ssp. gordonii	—
Physaria gracilis ssp. nuttallii	—
Rorippa fernaldiana	—
Rorippa palustris ssp. fernaldiana	—
Rorippa sessiliflora	stalkless yellowcress
Rorippa sinuata	spreading yellowcress
Sibara virginica	Virginia rockcress
Sinapis arvensis	wild mustard
Sisymbrium altissimum	tumble-mustard
Thlaspi arvense	field pennycress
Thlaspi perfoliatum	thorowort pennycress
Cactaceae	**Cactus Family**
Coryphantha missouriensis	Missouri foxtail cactus
Opuntia macrorhiza	bigroot prickly pear
Callitrichaceae	**Water-starwort Family**
Callitriche heterophylla	—
Callitriche terrestris	—
Campanulaceae	**Bellflower Family**
Campanula americana	American bellflower
Lobelia cardinalis	cardinal flower
Lobelia siphilitica	great lobelia
Lobelia spicata	palespike lobelia
Triodanis biflora	—
Triodanis holzingeri	—
Triodanis leptocarpa	slender-fruit Venus'-looking-glass
Triodanis perfoliata	clasping-leaf Venus'-looking-glass
Cannabaceae	**Hemp Family**
Cannabis sativa	domestic hemp
Humulus japonicus	Japanese hops
Humulus lupulus var. pubescens	—

SCIENTIFIC NAME	COMMON NAME
Capparaceae	**Caper Family**
Polanisia dodecandra ssp. trachysperma	—
Caprifoliaceae	**Honeysuckle Family**
Lonicera flava	yellow honeysuckle
Lonicera japonica	Japanese honeysuckle
Lonicera maackii	Maack's honeysuckle
Lonicera morrowii	—
Lonicera sempervirens	trumpet honeysuckle
Lonicera tatarica	tatarian honeysuckle
Sambucus canadensis	common elderberry
Symphoricarpos orbiculatus	buckbrush
Triosteum perfoliatum	clasping horse-gentian
Viburnum prunifolium	blackhaw
Viburnum rufidulum	rusty blackhaw
Caryophyllaceae	**Pink Family**
Arenaria serpyllifolia	thyme-leaved sandwort
Arenaria serpyllifolia var. serpyllifolia	thyme-leaved sandwort
Cerastium brachypodum	shortstalk cerastium
Cerastium fontanum ssp. vulgare	—
Cerastium pumilum	—
Dianthus armeria	Deptford pink
Holosteum umbellatum	jagged chickweed
Minuartia patula	—
Paronychia fastigiata var. fastigiata	forked nailwort
Saponaria officinalis	bouncingbet
Silene antirrhina	sleep catchfly
Silene latifolia	—
Silene stellata	starry campion
Stellaria media	chickweed
Stellaria pallida	pale chickweed
Celastraceae	**Bittersweet Family**
Celastrus scandens	American bittersweet
Euonymus atropurpurea	wahoo
Euonymus fortunei	Chinese wintercreeper
Ceratophyllaceae	**Hornwort Family**
Ceratophyllum demersum	common hornwort
Ceratophyllum echinatum	prickly hornwort
Chenopodiaceae	**Goosefoot Family**
Chenopodium album	lamb's-quarters
Chenopodium berlandieri var. zschackii	pit-seed goosefoot
Chenopodium glaucum	oak-leaved goosefoot
Chenopodium missouriense	Missouri goosefoot
Chenopodium pallescens	pale goosefoot

SCIENTIFIC NAME	COMMON NAME
Chenopodium pratericola	field goosefoot
Chenopodium simplex	maple-leaf goosefoot
Chenopodium standleyanum	Standley's goosefoot
Cycloloma atriplicifolium	winged pigweed
Dysphania ambrosioides	worm-seed goosefoot
Dysphania anthelmintica	wormseed
Kochia scoparia	broom kochia
Monolepis nuttalliana	Nuttall's poverty-weed
Salsola collina	Russian thistle
Salsola iberica	—
Cistaceae	**Rock-rose Family**
Helianthemum bicknellii	Bicknell's frostweed
Lechea tenuifolia	narrowleaf pinweed
Clusiaceae	**Mangosteen Family**
Hypericum drummondii	nits-and-lice
Hypericum perforatum	common St. John's-wort
Hypericum punctatum	spotted St. John's-wort
Hypericum sphaerocarpum	round-fruit St. John's-wort
Commelinaceae	**Spiderwort Family**
Commelina erecta	erect dayflower
Tradescantia bracteata	bracted spiderwort
Tradescantia occidentalis	prairie spiderwort
Tradescantia ohiensis	Ohio spiderwort
Tradescantia tharpii	Tharp's spiderwort
Convolvulaceae	**Morning-glory Family**
Calystegia macounii	Macoun's bindweed
Calystegia sepium	—
Calystegia silvatica ssp. fraterniflora	—
Convolvulus arvensis	field bindweed
Evolvulus nuttallianus	Nuttall's *evolvulus*
Ipomoea coccinea	red morning-glory
Ipomoea hederacea	ivy-leaf morning-glory
Ipomoea lacunosa	white morning-glory
Ipomoea leptophylla	bush morning-glory
Ipomoea pandurata	bigroot morning-glory
Ipomoea purpurea	common morning-glory
Ipomoea shumardiana	Shumard's morning-glory
Cornaceae	**Dogwood Family**
Cornus amomum ssp. obliqua	pale dogwood
Cornus drummondii	roughleaf dogwood
Crassulaceae	**Stonecrop Family**
Crassula drummondii	—
Penthorum sedoides	ditch stonecrop

SCIENTIFIC NAME	COMMON NAME
Cucurbitaceae	**Cucumber Family**
Citrullus lanatus var. lanatus	watermelon
Cucurbita foetidissima	buffalo gourd
Echinocystis lobata	wild mock-cucumber
Melothria pendula	creeping cucumber
Sicyos angulatus	bur cucumber
Cupressaceae	**Cypress Family**
Chamaecyparis lawsoniana	—
Juniperus virginiana var. virginiana	eastern red-cedar
Cuscutaceae	**Dodder Family**
Cuscuta coryli	hazel dodder
Cuscuta glomerata	cluster dodder
Cuscuta indecora var. indecora	—
Cuscuta pentagona	—
Cyperaceae	**Sedge Family**
Bolboschoenus fluviatilis	river tuberous-bulrush
Bolboschoenus maritimus ssp. paludosus	saltmarsh tuberous-bulrush
Bulbostylis capillaris	hairsedge bulbstyle
Carex aggregata	cluster sedge
Carex albicans var. albicans	white-tinge sedge
Carex annectens	yellow-fruit sedge
Carex austrina	southern sedge
Carex bicknellii	Bicknell's sedge
Carex blanda	woodland sedge
Carex brevior	short-beak sedge
Carex bushii	Bush's sedge
Carex crus-corvi	raven-foot sedge
Carex davisii	Davis' sedge
Carex emoryi	emory sedge
Carex festucacea	fescue sedge
Carex fissa	—
Carex frankii	Frank's sedge
Carex gravida	heavy sedge
Carex grisea	narrow-leaf sedge
Carex hirsutella	—
Carex hyalinolepis	thinscale sedge
Carex hystericina	bottle-brush sedge
Carex inops ssp. heliophila	sun sedge
Carex laeviconica	smoothcone sedge
Carex leavenworthii	Leavenworth's sedge
Carex lupulina	hop sedge
Carex meadii	Mead's sedge
Carex microdonta	littletooth sedge

SCIENTIFIC NAME	COMMON NAME
Carex molesta	pest sedge
Carex muehlenbergii var. enervis	—
Carex oligocarpa	straight-fruit sedge
Carex pellita	woolly sedge
Carex shinnersii	—
Carex umbellata	umbellate sedge
Carex vulpinoidea	fox sedge
Cyperus acuminatus	tapeleaf sedge
Cyperus bipartitus	brook flatsedge
Cyperus echinatus	globe flatsedge
Cyperus erythrorhizos	redroot flatsedge
Cyperus esculentus	yellow nutsedge
Cyperus lupulinus	slender-stem flat-rush
Cyperus odoratus	slender flatsedge
Cyperus pseudovegetus	falsegreen flatsedge
Cyperus schweinitzii	Schweinitz's flat-sedge
Cyperus setigerus	—
Cyperus squarrosus	awned flatsedge
Cyperus strigosus	false nutsedge
Cyperus X mesochoreus	intermediate flat-sedge
Eleocharis acicularis	needle spike-rush
Eleocharis compressa	flat-stem spike-rush
Eleocharis engelmannii	Engelmann's spike-rush
Eleocharis erythropoda	bald spike-rush
Eleocharis macrostachya	longstem spikesedge
Eleocharis montevidensis	—
Eleocharis obtusa	blunt spike-rush
Eleocharis palustris	marsh spike-rush
Fimbristylis annua	annual fimbristylis
Fimbristylis autumnalis	slender fimbristylis
Fimbristylis puberula var. puberula	—
Fimbristylis vahlii	Vahl's fimbristylis
Fuirena simplex var. aristulata	—
Lipocarpha aristulata	pointed lipocarpha
Lipocarpha drummondii	Drummond's lipocarpha
Schoenoplectus acutus var. acutus	hard-stem twine-bulrush
Schoenoplectus heterochaetus	slender bulrush
Schoenoplectus pungens	common threesquare twine-bulrush
Schoenoplectus tabernaemontani	soft-stem twine-bulrush
Scirpus atrovirens	green bulrush
Scirpus georgianus	Georgia bulrush
Scirpus pallidus	pale bulrush
Scirpus pendulus	rusty bulrush

SCIENTIFIC NAME	COMMON NAME
Dipsacaceae	**Teasel Family**
Dipsacus laciniatus	cutleaf teasel
Dryopteridaceae	**Wood Fern Family**
Cystopteris protrusa	southern bladder fern
Cystopteris tennesseensis	Tennessee bladder fern
Dryopteris marginalis	marginal wood fern
Onoclea sensibilis	sensitive fern
Polystichum acrostichoides	Christmas fern
Woodsia obtusa	—
Ebenaceae	**Ebony Family**
Diospyros virginiana	persimmon
Elatinaceae	**Waterwort Family**
Bergia texana	Texas bergia
Equisetaceae	**Horsetail Family**
Equisetum arvense	field horsetail
Equisetum hyemale ssp. affine	common scouring-rush
Equisetum laevigatum	smooth scouring rush
Equisetum X ferrissii	Ferriss' scouring rush
Euphorbiaceae	**Spurge Family**
Acalypha deamii	Deam's copperleaf
Acalypha monococca	slender copperleaf
Acalypha ostryifolia	rough-pod copperleaf
Acalypha rhomboidea	rhombic copperleaf
Acalypha virginica	Virginia copperleaf
Argythamnia mercurialina	Mercury's argythamnia
Chamaesyce glyptosperma	ridge-seed mat-spurge
Chamaesyce humistrata	spreading spurge
Chamaesyce maculata	spotted spurge
Chamaesyce missurica	Missouri spurge
Chamaesyce nutans	eyebane
Chamaesyce prostrata	prostrate spurge
Chamaesyce serpens	round-leaf mat-spurge
Chamaesyce stictospora	slim-seed mat-spurge
Croton capitatus var. capitatus	woolly croton
Croton glandulosus var. septentrionalis	tropic croton
Croton monanthogynus	one-seeded croton
Croton texensis	Texas croton
Croton willdenowii	rush-foil
Euphorbia corollata	flowering spurge
Euphorbia cyathophora	painted spurge
Euphorbia davidii	western toothed spurge
Euphorbia dentata	eastern toothed spurge
Euphorbia hexagona	six-angled spurge

SCIENTIFIC NAME	COMMON NAME
Euphorbia marginata	snow-on-the-mountain
Euphorbia spathulata	warty spurge
Euphorbia virgata	—
Ricinus communis	castor bean
Tragia betonicifolia	nettleleaf noseburn
Tragia ramosa	stalked noseburn
Fabaceae	**Pea Family**
Acacia angustissima var. hirta	—
Albizia julibrissin	silktree
Amorpha canescens	lead plant
Amorpha fruticosa	false indigo
Amorpha nana	dwarf wild indigo
Amphicarpaea bracteata	hog peanut
Apios americana	American potato bean
Astragalus crassicarpus	ground-plum milk-vetch
Astragalus lotiflorus	lotus milk-vetch
Astragalus plattensis	Platte River milk-vetch
Baptisia alba var. macrophylla	—
Baptisia australis var. minor	blue wild-indigo
Baptisia bracteata var. leucophaea	plains wild-indigo
Baptisia leucophaea	plains wild-indigo
Baptisia X bicolor	—
Cercis canadensis	redbud
Chamaecrista fasciculata	showy partridge pea
Chamaecrista nictitans ssp. nictitans var. nictitans	—
Colutea arborescens	bladder senna
Crotalaria sagittalis	rattlebox
Dalea aurea	golden prairie-clover
Dalea candida var. candida	white prairie-clover
Dalea enneandra	nine-anther prairie-clover
Dalea lanata var. lanata	—
Dalea leporina	hare's-foot prairie-clover
Dalea multiflora	roundhead prairie-clover
Dalea purpurea	purple prairie-clover
Dalea villosa var. villosa	—
Desmanthus illinoensis	Illinois bundleflower
Desmanthus leptolobus	slenderlobe bundleflower
Desmodium canadense	Canada tickclover
Desmodium canescens	hoary tickclover
Desmodium ciliare	slender tickclover
Desmodium cuspidatum	long-leaf tickclover
Desmodium glabellum	—
Desmodium glutinosum	large-flowered tickclover

SCIENTIFIC NAME	COMMON NAME
Desmodium illinoense	Illinois tickclover
Desmodium paniculatum	—
Desmodium perplexum	Dillen's tick-clover
Desmodium sessilifolium	sessile-leaf tickclover
Gleditsia triacanthos	honey locust
Glycyrrhiza lepidota	wild licorice
Gymnocladus dioicus	Kentucky coffee-tree
Kummerowia stipulacea	Korean clover
Lespedeza capitata	round-head lespedeza
Lespedeza cuneata	sericea lespedeza
Lespedeza formosa	—
Lespedeza procumbens	trailing lespedeza
Lespedeza repens	creeping lespedeza
Lespedeza stuevei	tall bush lespedeza
Lespedeza violacea	prairie lespedeza
Lespedeza virginica	slender bush lespedeza
Lespedeza X simulata	—
Lotus corniculatus	bird's-foot trefoil
Lotus unifoliolatus var. unifoliolatus	—
Medicago lupulina	black medick
Medicago minima	prickly medick
Medicago sativa ssp. sativa	alfalfa
Melilotus albus	white sweet clover
Melilotus officinalis	yellow sweet clover
Mimosa quadrivalvis var. nuttallii	cat-claw mimosa
Oxytropis lambertii	Lambert's crazyweed
Pediomelum argophyllum	silver-leaf scurfpea
Pediomelum esculentum	prairie-turnip
Psoralidium argophyllum	—
Psoralidium lanceolatum	lemon scurfpea
Psoralidium tenuiflorum	many-flowered scurf-pea
Robinia pseudoacacia	black locust
Securigera varia	—
Senna marilandica	Maryland senna
Strophostyles helvula	wild bean
Strophostyles leiosperma	slick-seed bean
Tephrosia virginiana	goat's rue
Trifolium campestre	low hop clover
Trifolium hybridum	alsike clover
Trifolium hybridum ssp. elegans	—
Trifolium pratense	red clover
Trifolium repens	white clover
Vicia americana	American vetch

SCIENTIFIC NAME	COMMON NAME
Vicia villosa ssp. villosa	hairy vetch
Fagaceae	**Beech Family**
Quercus imbricaria	shingle oak
Quercus macrocarpa	bur oak
Quercus marilandica	blackjack oak
Quercus muehlenbergii	chinquapin oak
Quercus prinoides	dwarf chinquapin oak
Quercus rubra	—
Quercus shumardii	Shumard's oak
Quercus stellata	post oak
Quercus velutina	black oak
Quercus X bushii	—
Fumariaceae	**Fumitory Family**
Corydalis crystallina	mealy corydalis
Corydalis micrantha ssp. micrantha	—
Dicentra cucullaria	Dutchman's breeches
Gentianaceae	**Gentian Family**
Gentiana puberulenta	downy gentian
Sabatia campestris	prairie rose gentian
Geraniaceae	**Geranium Family**
Erodium cicutarium	filaree
Geranium carolinianum	Carolina cranesbill
Geranium pusillum	small cranesbill
Grossulariaceae	**Currant Family**
Ribes aureum var. villosum	—
Ribes missouriense	Missouri gooseberry
Haloragaceae	**Watermilfoil Family**
Myriophyllum heterophyllum	water milfoil
Myriophyllum pinnatum	green parrot's feather
Hippocastanaceae	**Horse Chestnut Family**
Aesculus glabra var. arguta	Ohio buckeye
Hydrocharitaceae	**Waterleaf Family**
Najas guadalupensis	common naiad
Najas guadalupensis ssp. guadalupensis	common naiad
Hydrophyllaceae	**Waterleaf Family**
Ellisia nyctelea	waterpod
Hydrophyllum virginianum	Virginia waterleaf
Iridaceae	**Iris Family**
Iris flavescens	—
Iris germanica	bearded iris
Iris pseudacorus	yellow-flag iris
Iris pumila	—
Nemastylis geminiflora	nemastylis

SCIENTIFIC NAME	COMMON NAME
Sisyrinchium angustifolium	common blue-eyed grass
Sisyrinchium campestre	prairie blue-eyed grass
Isoetaceae	**Quillwort Family**
Isoetes butleri	Butler's quillwort
Juglandaceae	**Walnut Family**
Carya cordiformis	bitternut hickory
Carya illinoinensis	pecan
Carya ovata	shagbark hickory
Juglans nigra	black walnut
Juncaceae	**Rush Family**
Juncus acuminatus	tapertip rush
Juncus diffusissimus	slimpod rush
Juncus dudleyi	Dudley's rush
Juncus interior	inland rush
Juncus marginatus	shore rush
Juncus nodatus	stout rush
Juncus tenuis	path rush
Juncus torreyi	Torrey's rush
Luzula bulbosa	wood rush
Lamiaceae	**Mint Family**
Agastache nepetoides	catnip giant hyssop
Glechoma hederacea	ground ivy
Hedeoma hispida	rough false pennyroyal
Lamium amplexicaule	henbit
Lamium purpureum	deadnettle
Leonurus cardiaca	common motherwort
Lycopus americanus	American bugleweed
Marrubium vulgare	common horehound
Mentha arvensis	field mint
Monarda bradburiana	Bradbury bee-balm
Monarda citriodora	lemon bee-balm
Monarda fistulosa	wild bergamot bee-balm
Nepeta cataria	catnip
Physostegia angustifolia	false dragonhead
Prunella vulgaris	self-heal
Pycnanthemum tenuifolium	slender mountain mint
Salvia azurea	blue sage
Salvia reflexa	lanceleaf sage
Scutellaria lateriflora	sideflower skullcap
Scutellaria parvula	small skullcap
Stachys tenuifolia	slenderleaf betony
Teucrium canadense	American germander
Trichostema brachiatum	false pennyroyal

SCIENTIFIC NAME	COMMON NAME
Lemnaceae	**Duckweed Family**
Lemna aequinoctialis	equinox duckweed
Lemna minor	lesser duckweed
Lemna obscura	obscure duckweed
Lemna perpusilla	minute duckweed
Lemna turionifera	turion duckweed
Spirodela polyrrhiza	greater duckmeat
Wolffia columbiana	Columbia watermeal
Lentibulariaceae	**Bladderwort Family**
Utricularia macrorhiza	common bladderwort
Liliaceae	**Lily Family**
Allium canadense	Canadian onion
Allium sativum	wild onion
Allium stellatum	pink wild onion
Allium vineale	field garlic
Androstephium coeruleum	blue funnel lily
Asparagus officinalis	garden asparagus
Camassia angusta	wild hyacinth
Camassia scilloides	wild hyacinth
Erythronium albidum	white dogtooth violet
Erythronium mesochoreum	prairie dogtooth violet
Hemerocallis fulva	day lily
Hypoxis hirsuta	yellow star grass
Maianthemum racemosum	feathery false Solomon's seal
Maianthemum stellatum	starry spikenard
Muscari neglectum	—
Nothoscordum bivalve	false garlic
Ornithogalum umbellatum	star-of-Bethlehem
Polygonatum biflorum	Solomon's seal
Toxicoscordion nuttallii	—
Linaceae	**Flax Family**
Linum pratense	Norton's flax
Linum sulcatum	grooved flax
Loasaceae	**Loasa Family**
Mentzelia oligosperma	stick-leaf chickenthief
Lythraceae	**Loosestrife Family**
Ammannia auriculata	earleaf ammannia
Ammannia coccinea	red ammannia
Ammannia robusta	purple ammannia
Didiplis diandra	water purslane
Lythrum alatum	winged loosestrife
Lythrum californicum	California loosestrife
Lythrum salicaria	purple loosestrife

SCIENTIFIC NAME	COMMON NAME
Rotala ramosior	rotala
Malvaceae	**Mallow Family**
Abutilon theophrasti	velvet-leaf
Callirhoe alcaeoides	pale poppy mallow
Callirhoe involucrata	purple poppy mallow
Callirhoe leiocarpa	hairy-fruited poppy mallow
Hibiscus laevis	halberd-leaved rose mallow
Hibiscus trionum	flower-of-an-hour
Malva neglecta	common mallow
Malva pusilla	running mallow
Malvastrum hispidum	hairy false mallow
Sida spinosa	prickly sida
Marsileaceae	**Water Clover Family**
Marsilea vestita	western water-clover
Menispermaceae	**Moonseed Family**
Cocculus carolinus	Carolina snailseed
Menispermum canadense	moonseed
Molluginaceae	**Carpetweed Family**
Mollugo verticillata	carpetweed
Moraceae	**Mulberry Family**
Maclura pomifera	Osage orange
Morus alba	white mulberry
Morus rubra	red mulberry
Nelumbonaceae	**Lotus-lily Family**
Nelumbo lutea	American lotus
Nyctaginaceae	**Four-o'clock Family**
Mirabilis albida	white four-o'clock
Mirabilis linearis	narrowleaf four-o'clock
Mirabilis nyctaginea	wild four-o'clock
Nymphaeaceae	**Water-lily Family**
Nymphaea odorata ssp. odorata	fragrant water-lily
Oleaceae	**Olive Family**
Fraxinus americana	white ash
Fraxinus pennsylvanica	green ash
Fraxinus quadrangulata	blue ash
Syringa vulgaris	common lilac
Onagraceae	**Evening Primrose Family**
Calylophus serrulatus	plains yellow evening-primrose
Circaea lutetiana ssp. canadensis	broadleaf enchanter's nightshade
Epilobium coloratum	purple-leaved willow-herb
Epilobium X wisconsinense	Wisconsin willow-herb
Gaura coccinea	scarlet butterfly-weed
Gaura longiflora	biennial gaura

SCIENTIFIC NAME	COMMON NAME
Gaura mollis	velvet butterfly-weed
Ludwigia alternifolia var. pubescens	—
Ludwigia palustris	water purslane
Ludwigia peploides	floating seedbox
Oenothera biennis	common evening primrose
Oenothera laciniata	cutleaf evening primrose
Oenothera linifolia	narrow-leaved evening primrose
Oenothera macrocarpa ssp. macrocarpa	Missouri evening-primrose
Oenothera pilosella	meadow evening primrose
Oenothera rhombipetala	fourpoint evening primrose
Oenothera speciosa	white evening primrose
Oenothera triloba	stemless evening primrose
Oenothera villosa	hairy evening-primrose
Stenosiphon linifolius	stenosiphon
Ophioglossaceae	**Fern Family**
Botrychium virginianum	rattlesnake fern
Ophioglossum engelmannii	limestone adder's-tongue
Orchidaceae	**Orchid Family**
Platanthera praeclara—Threatened	western prairie fringed orchid
Spiranthes cernua	nodding ladies'-tresses
Spiranthes lacera	slender ladies'-tresses
Spiranthes magnicamporum	Great Plains ladies'-tresses
Spiranthes tuberosa	little ladies'-tresses
Spiranthes vernalis	upland ladies'-tresses
Spiranthes vernalis	upland ladies'-tresses
Osmundaceae	**Royal Fern Family**
Osmunda regalis var. spectabilis	—
Oxalidaceae	**Wood-sorrel Family**
Oxalis dillenii	green wood sorrel
Oxalis stricta	yellow wood-sorrel
Oxalis violacea	violet wood sorrel
Papaveraceae	**Poppy Family**
Argemone polyanthemos	prickly poppy
Papaver rhoeas	field poppy
Phytolaccaceae	**Pokeweed Family**
Phytolacca americana var. americana	American pokeweed
Pinaceae	**Pine Family**
Pinus nigra	—
Pinus ponderosa	—
Pinus sylvestris	—
Plantaginaceae	**Plantain Family**
Plantago aristata	bottlebrush plantain
Plantago elongata ssp. elongata	slender plantain

SCIENTIFIC NAME	COMMON NAME
Plantago lanceolata	English plantain
Plantago patagonica var. patagonica	woolly plantain
Plantago pusilla	tiny plantain
Plantago rhodosperma	red-seeded plantain
Plantago rugelii	Rugel's plantain
Plantago virginica	pale-seeded plantain
Platanaceae	**Sycamore Family**
Platanus occidentalis	sycamore
Poaceae	**Grass Family**
Aegilops cylindrica	jointed goatgrass
Aegilotriticum sancti-andreae	—
Agrostis elliottiana	awned bentgrass
Agrostis gigantea	redtop
Agrostis hyemalis	winter bent grass
Agrostis stolonifera	creeping bent grass
Alopecurus carolinianus	Carolina foxtail
Andropogon gerardii	big bluestem
Andropogon hallii	sandhill bluestem
Andropogon scoparius	little bluestem
Andropogon virginicus	broomsedge bluestem
Aristida basiramea	forktip threeawn
Aristida dichotoma var. curtissii	—
Aristida longespica var. geniculata	—
Aristida oligantha	old-field threeawn
Aristida purpurascens	arrow feather threeawn
Avena fatua var. sativa	—
Bothriochloa bladhii	Caucasian bluestem
Bothriochloa ischaemum var. songarica	Turkestan bluestem
Bothriochloa laguroides ssp. torreyana	silver bluestem
Bouteloua curtipendula	side-oats grama
Bouteloua gracilis	blue grama
Bouteloua hirsuta	hairy grama
Bromus catharticus	rescuegrass
Bromus commutatus	hairy chess
Bromus inermis	smooth brome
Bromus japonicus	Japanese brome
Bromus pubescens	Canada brome
Bromus secalinus	rye brome
Bromus tectorum	downy brome
Buchloe dactyloides	buffalo grass
Calamovilfa longifolia var. longifolia	prairie sand-reed
Cenchrus incertus	coast sandbur
Cenchrus longispinus	field sandbur

SCIENTIFIC NAME	COMMON NAME
Chasmanthium latifolium	sea oats
Chloris verticillata	windmillgrass
Chloris virgata	showy chloris
Cynodon dactylon	bermudagrass
Dactylis glomerata	orchardgrass
Danthonia spicata	poverty oat grass
Diarrhena obovata	American beakgrass
Dichanthelium acuminatum	—
Dichanthelium malacophyllum	soft-leaf dichanthelium
Dichanthelium oligosanthes ssp. scribnerianum	Scribner's dichanthelium
Dichanthelium ovale ssp. praecocius	—
Dichanthelium perlongum	long-spike dichanthelium
Dichanthelium sphaerocarpon	roundseed dichanthelium
Digitaria ciliaris	southern crabgrass
Digitaria cognata ssp. cognata	fall witch grass
Digitaria filiformis	slender crabgrass
Digitaria ischaemum	smooth crabgrass
Digitaria sanguinalis	hairy crabgrass
Echinochloa colona	jungle-rice
Echinochloa crus-galli	barnyard grass
Echinochloa esculenta	—
Echinochloa muricata	rough barnyard grass
Eleusine indica	goosegrass
Elymus canadensis	Canada wildrye
Elymus glabriflorus	smooth wildrye
Elymus macgregorii	McGregor's wild rye
Elymus repens	quack grass
Elymus submuticus	Virginia wild-rye
Elymus villosus	hairy wildrye
Elymus virginicus	Virginia wild-rye
Elymus X maltei	—
Eragrostis capillaris	lacegrass
Eragrostis cilianensis	stink grass
Eragrostis curtipedicellata	gummy lovegrass
Eragrostis frankii	sandbar lovegrass
Eragrostis hypnoides	teal lovegrass
Eragrostis intermedia	plains lovegrass
Eragrostis minor	little lovegrass
Eragrostis pectinacea	Carolina love grass
Eragrostis spectabilis	purple lovegrass
Eragrostis trichodes	sand lovegrass
Eriochloa contracta	prairie cupgrass
Festuca subverticillata	nodding fescue

SCIENTIFIC NAME	COMMON NAME
Glyceria striata	fowl mannagrass
Glyceria striata var. striata	fowl mannagrass
Gymnopogon ambiguus	bearded skeletongrass
Hesperostipa comata ssp. comata	needle-and-thread
Hesperostipa spartea	porcupine grass
Hordeum jubatum	foxtail barley
Hordeum pusillum	little barley
Koeleria macrantha	prairie June grass
Leersia oryzoides	rice cut grass
Leersia virginica	whitegrass
Leptochloa fascicularis	bearded sprangletop
Leptochloa fusca fascicularis	bearded sprangletop
Leptochloa mucronata	red sprangletop
Leptochloa panicea ssp. mucronata	red sprangletop
Lolium perenne var. perenne	—
Melica nitens	threeflower melic
Muhlenbergia bushii	Bush's muhly
Muhlenbergia capillaris	hairgrass
Muhlenbergia cuspidata	plains muhly
Muhlenbergia frondosa	wirestem muhly
Muhlenbergia mexicana	Mexican muhly
Muhlenbergia racemosa	marsh muhly
Muhlenbergia schreberi	nimblewill
Muhlenbergia sobolifera	rock muhly
Muhlenbergia sylvatica	forest muhly
Neeragrostis reptans	—
Panicum anceps	beaked panicum
Panicum capillare	common witch grass
Panicum dichotomiflorum	fall panicum
Panicum flexile	wiry witchgrass
Panicum obtusum	vine-mesquite
Panicum philadelphicum	Philadelphia witchgrass
Panicum rigidulum	redtop panicum
Panicum virgatum	switchgrass
Pascopyrum smithii	western wheatgrass
Paspalum floridanum var. glabratum	—
Paspalum laeve var. circulare	—
Paspalum pubiflorum var. glabrum	hairy-seed paspalum
Paspalum setaceum var. muhlenbergii	thin paspalum
Paspalum setaceum var. stramineum	—
Phalaris arundinacea	reed canarygrass
Phalaris caroliniana	Carolina canarygrass
Phleum pratense	timothy

SCIENTIFIC NAME	COMMON NAME
Phleum pratense ssp. pratense	timothy
Phragmites australis	common reed
Poa annua	annual bluegrass
Poa bulbosa	bulbose bluegrass
Poa compressa	Canada bluegrass
Poa pratensis	Kentucky bluegrass
Poa sylvestris	woodland bluegrass
Saccharum ravennae	plumegrass
Schedonnardus paniculatus	tumblegrass
Schedonorus arundinaceus	tall rye grass
Schedonorus pratensis	meadow rye grass
Schizachyrium scoparium	little bluestem
Sclerochloa dura	hardgrass
Setaria faberi	Chinese foxtail
Setaria glauca	—
Setaria italica	foxtail millet
Setaria parviflora	knotroot bristlegrass
Setaria pumila	yellow bristle grass
Setaria viridis	green foxtail
Sorghastrum nutans	Indiangrass
Sorghum bicolor	sorghum
Sorghum halepense	Johnsongrass
Spartina pectinata	prairie cordgrass
Sphenopholis obtusata var. obtusata	wedgescale
Sporobolus airoides	alkali sacaton
Sporobolus asper var. drummondii	rough dropseed
Sporobolus clandestinus	—
Sporobolus compositus	rough dropseed
Sporobolus cryptandrus	sand dropseed
Sporobolus heterolepis	prairie dropseed
Sporobolus neglectus	puffsheath dropseed
Sporobolus ozarkanus	Ozark dropseed
Sporobolus pyramidatus	whorled dropseed
Sporobolus vaginiflorus	povertygrass
Thinopyrum ponticum	tall sand-wheat
Tridens flavus	purpletop
Tridens muticus var. elongatus	—
Tridens strictus	longspike tridens
Triplasis purpurea	purple sandgrass
Tripsacum dactyloides	eastern gammagrass
Triticum aestivum	bread wheat
Vulpia octoflora	sixweeks fescue

SCIENTIFIC NAME	COMMON NAME
Polemoniaceae	**Phlox Family**
Phlox divaricata	wild blue phlox
Phlox oklahomensis	Oklahoma phlox
Phlox pilosa ssp. pilosa	downy phlox
Polygalaceae	**Milkwort Family**
Polygala incarnata	slender milkwort
Polygala verticillata	whorled milkwort
Polygonaceae	**Buckwheat Family**
Eriogonum annuum	annual eriogonum
Fagopyrum esculentum	buckwheat
Fallopia convolvulus	black bindweed
Fallopia scandens	climbing false-buckwheat
Persicaria amphibia	water smartweed
Persicaria bicornis	pink smartweed
Persicaria hydropiperoides	swamp smartweed
Persicaria lapathifolia	pale smartweed
Persicaria maculosa	spotted lady's-thumb, redshank
Persicaria pensylvanica	Pennsylvania smartweed
Persicaria punctata	dotted smartweed
Persicaria virginiana	jumpseed
Polygonum aviculare	prostrate knotweed
Polygonum erectum	erect knotweed
Polygonum ramosissimum	bush knotweed
Polygonum tenue	slender knowtweed
Rumex acetosella	sheep sorrel
Rumex acetosella ssp. pyrenaicus	sheep sorrel
Rumex altissimus	pale dock
Rumex crispus	curly dock
Rumex maritimus	golden dock
Rumex patientia	patience dock
Rumex stenophyllus	narrow-leaf dock
Pontederiaceae	**Pickerel-weed Family**
Eichhornia crassipes	—
Heteranthera limosa	blue mud plantain
Heteranthera multiflora	—
Heteranthera rotundifolia	—
Pontederia cordata	common pickerelweed
Portulacaceae	**Purslane Family**
Claytonia virginica	Virginia spring beauty
Phemeranthus calycinus	rock-pink fameflower
Phemeranthus parviflorus	prairie fameflower
Portulaca oleracea	common purslane
Portulaca pilosa	hairy purslane

SCIENTIFIC NAME	COMMON NAME
Potamogetonaceae	**Pondweed Family**
Potamogeton diversifolius	water-thread pondweed
Potamogeton foliosus	leafy pondweed
Potamogeton nodosus	long-leaf pondweed
Potamogeton pusillus	—
Stuckenia pectinata	sago pondweed
Primulaceae	**Primrose Family**
Anagallis arvensis	scarlet pimpernel
Androsace occidentalis	western rock-jasmine
Dodecatheon meadia var. meadia	—
Lysimachia ciliata	fringed loosestrife
Lysimachia nummularia	moneywort
Ranunculaceae	**Buttercup Family**
Anemone canadensis	meadow anemone
Anemone caroliniana	Carolina anemone
Anemone cylindrica	candle anemone
Anemone virginiana	tall anemone
Aquilegia	columbine
Aquilegia canadensis	American columbine
Clematis pitcheri	Pitcher's clematis
Clematis terniflora	virgin's bower
Consolida ajacis	rocket larkspur
Delphinium carolinianum	Carolina larkspur
Delphinium tricorne	dwarf larkspur
Enemion biternatum	false rue anemone
Myosurus minimus	mousetail
Ranunculus abortivus	early wood buttercup
Ranunculus aquatilis var. diffusus	white water crowfoot
Ranunculus hispidus var. hispidus	—
Ranunculus sardous	hairy buttercup
Ranunculus sceleratus var. sceleratus	cursed crowfoot
Ranunculus testiculatus	bur buttercup
Thalictrum dasycarpum	purple meadow-rue
Rhamnaceae	**Buckthorn Family**
Ceanothus americanus	New Jersey tea
Ceanothus herbaceus	inland ceanothus
Ceanothus ovatus	—
Rhamnus lanceolata var. glabrata	—
Rosaceae	**Rose Family**
Agrimonia parviflora	many-flowered agrimony
Agrimonia pubescens	downy agrimony
Amelanchier arborea	tall service berry
Amelanchier sanguinea	—

SCIENTIFIC NAME	COMMON NAME
Crataegus coccinioides	Kansas hawthorn
Crataegus crus-galli	cockspur hawthorn
Crataegus mollis	summer hawthorn
Crataegus pruinosa	frosty hawthorn
Fragaria virginiana	wild strawberry
Geum canadense	white avens
Malus ioensis	—
Potentilla arguta	tall cinquefoil
Potentilla recta	sulphur cinquefoil
Potentilla rivalis	brook cinquefoil
Potentilla simplex	old-field cinquefoil
Prunus americana	wild plum
Prunus angustifolia	chickasaw plum
Prunus cerasus	sour cherry
Prunus mahaleb	mahaleb plum
Prunus mexicana	Mexican plum
Prunus munsoniana	wild-goose plum
Prunus persica	peach
Prunus rivularis	creek plum
Prunus serotina	black cherry
Prunus virginiana	choke cherry
Pyrus communis	pear
Rosa arkansana	prairie wild rose
Rosa blanda	smooth rose
Rosa multiflora	multiflora rose
Rosa setigera	climbing rose
Rosa X rudiuscula	—
Rubus aboriginum	one-flower dewberry
Rubus curtipes	—
Rubus discolor	Himalayan blackberry
Rubus enslenii	small dewberry
Rubus flagellaris	American dewberry
Rubus frondosus	leafy highbush blackberry
Rubus hancinianus	Hancin's dewberry
Rubus laudatus	praiseworth blackberry
Rubus meracus	dryslope dewberry
Rubus mollior	soft blackberry
Rubus occidentalis	black raspberry
Rubus ostryifolius	highbush blackberry
Rubus pensilvanicus	highbush blackberry
Rubus roribaccus	Lucretia dewberry
Rubiaceae	**Madder Family**
Cephalanthus occidentalis	buttonbush

SCIENTIFIC NAME	COMMON NAME
Diodia teres	rough buttonweed
Galium aparine	catchweed bedstraw
Galium circaezans	woods bedstraw
Galium concinnum	shining bedstraw
Galium obtusum	bluntleaf bedstraw
Galium pedemontanum	foothill bedstraw
Galium pilosum	hairy bedstraw
Galium triflorum	sweet-scent bedstraw
Galium virgatum	southwestern bedstraw
Hedyotis nigricans	narrow-leaf bluet
Houstonia pusilla	small bluets
Rutaceae	**Rue Family**
Poncirus trifoliata	—
Ptelea trifoliata	common hop tree
Zanthoxylum americanum	common prickly ash
Salicaceae	**Willow Family**
Populus deltoides ssp. monilifera	cottonwood
Populus nigra	black poplar
Populus X canadensis	Carolina poplar
Salix amygdaloides	peach-leaved willow
Salix caroliniana	Carolina willow
Salix eriocephala ssp. eriocephala eriocephala	diamond willow
Salix exigua ssp. interior	sandbar willow
Salix humilis var. humilis	—
Salix nigra	black willow
Santalaceae	**Sandalwood Family**
Comandra umbellata	umbellate bastard toad-flax
Sapindaceae	**Soapberry Family**
Cardiospermum halicacabum	common balloon vine
Sapindus saponaria var. drummondii	southern soapberry
Sapotaceae	**Sapodilla Family**
Bumelia lanuginosa var. oblongifolia	gum bully
Saxifragaceae	**Saxifrage Family**
Heuchera richardsonii	Richardson's alumroot
Scrophulariaceae	**Figwort Family**
Agalinis aspera	rough agalinis
Agalinis fasciculata	fascicled agalinis
Agalinis gattingeri	Gattinger's purple false foxglove
Agalinis heterophylla	stiff purple agalinis
Agalinis tenuifolia	slender agalinis
Bacopa rotundifolia	roundleaf water hyssop
Buchnera americana	blue hearts
Castilleja sessiliflora	downy paintbrush

SCIENTIFIC NAME	COMMON NAME
Chaenorrhinum minus	lesser dwarf-snapdragon
Collinsia violacea	violet collinsia
Cymbalaria muralis	Kenilworth ivy
Dasistoma macrophylla	mullein foxglove
Gratiola neglecta	golden hedge hyssop
Leucospora multifida	paleseed
Lindernia dubia	yellow false pimpernel
Mimulus alatus	sharpwing monkeyflower
Mimulus ringens	Alleghany monkeyflower
Nuttallanthus texanus	Texas toad-flax
Penstemon cobaea	cobaea beardtongue
Penstemon digitalis	smooth beardtongue
Penstemon grandiflorus	shell-leaf beardtongue
Penstemon tubiflorus	tube beardtongue
Scrophularia marilandica	Maryland figwort
Tomanthera densiflora	fine-leaf hairy-foxglove
Verbascum blattaria	moth mullein
Verbascum thapsus	woolly mullein
Veronica americana	American speedwell
Veronica anagallis-aquatica	blue water speedwell
Veronica arvensis	corn speedwell
Veronica catenata	pink water speedwell
Veronica peregrina	purslane speedwell
Veronica polita	wayside speedwell
Selaginellaceae	**Spike-moss Family**
Selaginella rupestris	rock spike-moss
Simaroubaceae	**Quassia Family**
Ailanthus altissima	tree-of-heaven
Smilacaceae	**Catbrier Family**
Smilax herbacea	—
Smilax hispida	bristly greenbrier
Smilax lasioneura	—
Smilax tamnoides	—
Solanaceae	**Nightshade Family**
Datura stramonium	jimsonweed
Lycium barbarum	matrimony vine
Physalis angulata var. pendula	cut-leaf ground-cherry
Physalis heterophylla	clammy groundcherry
Physalis hispida	—
Physalis longifolia	common ground-cherry
Physalis missouriensis	Missouri groundcherry
Physalis pumila	prairie ground-cherry
Physalis virginiana	—

SCIENTIFIC NAME	COMMON NAME
Physalis virginiana var. virginiana	—
Solanum carolinense	Carolina horse nettle
Solanum elaeagnifolium	silverleaf nightshade
Solanum interius	plains black nightshade
Solanum ptychanthum	black nightshade
Solanum rostratum	buffalo bur
Solanum sarrachoides	viscid nightshade
Sparganiaceae	**Bur-reed Family**
Sparganium eurycarpum	giant bur-reed
Staphyleaceae	**Bladder-nut Family**
Staphylea trifolia	American bladdernut
Tamaricaceae	**Tamarix Family**
Tamarix parviflora	small-flowered tamarisk
Tamarix ramosissima	salt cedar
Taxodiaceae	**Taxodium Family**
Taxodium distichum var. distichum	bald cypress
Thelypteridaceae	**Marsh Fern Family**
Thelypteris palustris var. pubescens	—
Tiliaceae	**Linden Family**
Tilia americana	American basswood
Typhaceae	**Cattail Family**
Typha angustifolia	narrow-leaved cattail
Typha domingensis	southern cattail
Typha latifolia	common cattail
Ulmaceae	**Elm Family**
Celtis laevigata	sugarberry
Celtis occidentalis	common hackberry
Celtis tenuifolia	dwarf hackberry
Ulmus americana	American elm
Ulmus pumila	Siberian elm
Ulmus rubra	slippery elm
Urticaceae	**Nettle Family**
Boehmeria cylindrica	bog hemp
Laportea canadensis	wood nettle
Parietaria pensylvanica	Pennsylvania pellitory
Pilea pumila	clearweed
Urtica dioica ssp. gracilis	stinging nettle
Valerianaceae	**Valerian Family**
Valerianella radiata	corn salad
Verbenaceae	**Verbena Family**
Glandularia bipinnatifida var. bipinnatifida	—
Glandularia canadensis	rose vervain
Phryma leptostachya	lopseed

SCIENTIFIC NAME	COMMON NAME
Phyla cuneifolia	wedgeleaf frogfruit
Phyla lanceolata	lanceleaf frogfruit
Verbena bipinnatifida	—
Verbena bracteata	prostrate verbena
Verbena canadensis	Canada verbena
Verbena hastata	blue verbena
Verbena simplex	narrowleaf verbena
Verbena stricta	woolly verbena
Verbena urticifolia	white verbena
Verbena X engelmannii	Engelmann's verbena
Verbena X moechina	pasture vervain
Vitex agnus-castus	—
Violaceae	**Violet Family**
Hybanthus verticillatus	North American calceolaria
Viola bicolor	Johnny-jump-up
Viola pedata	bird's-foot violet
Viola pedatifida	prairie violet
Viola pratincola	meadow violet
Viola pubescens	downy yellow violet
Viola sororia	downy blue violet
Viola striata	—
Vitaceae	**Grape Family**
Ampelopsis cordata	raccoon grape
Parthenocissus inserta	Virginia creeper
Parthenocissus quinquefolia	Virginia creeper
Vitis cinerea	graybark grape
Vitis riparia	riverbank grape
Vitis vulpina	winter grape
Zannichelliaceae	**Horned Pondweed Family**
Zannichellia palustris	horned pondweed
Zygophyllaceae	**Creosotebush Family**
Tribulus terrestris	puncture vine

ANIMALS

SCIENTIFIC NAME	COMMON NAME
Invertebrates	
Nicrophorus americanus—Endangered	American burying beetle
Probythinella emarginata	Delta hydrobe
Unionid Mussels	
Amblema plicata	Threeridge
Elliptio dilatata	Spike
Fusonaia flava	Wabash pigtoe
Lampsilis cardium	Plain pocketbook

SCIENTIFIC NAME	COMMON NAME
Lampsilis rafinequena	Neosho mucket
Lampsilis siliquoidea	Fat mucket
Lampsilis teres	Yellow sandshell
Lasmigona complanata	White heelsplitter
Leptodea fragilis	Fragile papershell
Ligumia subrostrata	Pondmussel
Obliquaria reflexa	Threehorn wartyback
Pyganodon grandis	Floater
Quadrula cylindrica	Rabbitsfoot
Quadrula metanevra	Monkeyface
Quadrula nodulata	Wartyback
Quadrula pustulosa	Pimpleback
Quadrula quadrula	Mapleleaf
Strophitus undulatus	Creeper
Toxolasma parvus	Lilliput
Tritogonia verrucosa	Pistolgrip
Truncilla donaciformis	Fawnsfoot
Truncilla truncata	Deertoe
Uniomerus tetralasmus	Pondhorn
Utterbackia imbecilis	Paper pondshell
Amphibians and Reptiles	
Ambystoma texanum	Smallmouth Salamander
Necturus maculosus	Mudpuppy
Bufo americanus	American Toad
Bufo cognatus	Great Plains Toad
Bufo woodhousii	Woodhouse's Toad
Acris crepitans	Northern Cricket Frog
Hyla chrysoscelis	Cope's Gray Treefrog
Pseudacris clarkii	Spotted Chorus Frog
Pseudacris triseriata	Western Chorus Frog
Gastrophryne olivacea	Great Plains Narrowmouth Toad
Spea bombifrons	Plains Spadefoot
Rana blairi	Plains Leopard Frog
Rana catesbeiana	Bullfrog
Rana sphenocephala	Southern Leopard Frog
Chelydra serpentina	Snapping Turtle
Macrochelys temminckii	Alligator Snapping Turtle
Chrysemys picta	Painted Turtle
Graptemys ouachitensis	Ouachita Map Turtle
Pseudemys concinna	River Cooter
Terrapene ornata	Western Box Turtle
Trachemys scripta	Slider
Kinosternon flavescens	Yellow Mud Turtle

SCIENTIFIC NAME	COMMON NAME
Sternotherus odoratus	Common Musk Turtle
Apalone mutica	Smooth Softshell
Apalone spinifera	Spiny Softshell
Ophisaurus attenuatus	Slender Glass Lizard
Crotaphytus collaris	Collared Lizard
Holbrookia maculata	Lesser Earless Lizard
Phrynosoma cornutum	Texas Horned Lizard
Sceloporus undulatus	Fence/prairie/plateau Lizard
Eumeces fasciatus	Five-lined Skink
Eumeces septentrionalis	Prairie Skink
Eumeces obsoletus	Great Plains Skink
Scincella lateralis	Ground Skink
Cnemidophorus sexlineatus	Six-lined Racerunner
Coluber constrictor	Racer
Diadophis punctatus	Ringneck Snake
Elaphe guttata	Corn Snake
Elaphe obsoleta	Rat Snake
Heterodon nasicus	Western Hognose Snake
Heterodon platirhinos	Eastern Hognose Snake
Lampropeltis calligaster	Prairie Kingsnake
Lampropeltis getula	Common Kingsnake
Lampropeltis triangulum	Milk Snake
Masticophis flagellum	Coachwhip
Nerodia erythrogaster	Plainbelly Water Snake
Nerodia rhombifer	Diamondback Water Snake
Nerodia sipedon	Northern Water Snake
Opheodrys aestivus	Rough Green Snake
Pituophis catenifer	Pine or Gopher Snake
Regina grahamii	Graham's Crayfish Snake
Sonora semiannulata	Ground Snake
Storeria dekayi	Brown Snake
Tantilla gracilis	Flathead Snake
Tantilla nigriceps	Plains Blackhead Snake
Thamnophis proximus	Western Ribbon Snake
Thamnophis radix	Plains Garter Snake
Thamnophis sirtalis	Common Garter Snake
Tropidoclonion lineatum	Lined Snake
Agkistrodon contortrix	Copperhead
Crotalus horridus	Timber Rattlesnake
Sistrurus catenatus	Massasauga
Fish	
Scaphirhynchus platorynchus	Shovelnose Sturgeon
Lepisosteus osseus	Longnose Gar

SCIENTIFIC NAME	COMMON NAME
Lepisosteus platostomus	Shortnose Gar
Anguilla rostrata	American Eel
Dorosoma cepedianum	Gizzard Shad
Hiodon alosoides	Goldeye
Esox lucius	Northern Pike
Campostoma anomalum	Central Stoneroller
Carassius auratus	Goldfish
Ctenopharyngodon idella	Grass Carp
Cyprinus carpio	Common Carp
Hybognathus argyritis	Western Silvery Minnow
Hybognathus placitus	Plains Minnow
Nocomis asper	Redspot Chub
Nocomis biguttatus	Hornyhead Chub
Notemigonus crysoleucas	Golden Shiner
Notropis atherinoides	Emerald Shiner
Notropis boops	Bigeye Shiner
Notropis buchanani	Ghost Shiner
Notropis giradi—Threatened	Arkansas River Shiner
Notropis stramineus	Sand Shiner
Notropis topeka—Endangered	Topeka Shiner
Notropis volucellus	Mimic Shiner
Notropis percobromus	Rosyface Shiner
Phenacobius mirabilis	Suckermouth Minnow
Phoxinus erythrogaster	Southern Redbelly Dace
Pimephales notatus	Bluntnose Minnow
Pimephales promelas	Fathead Minnow
Pimephales tenellus	Slim Minnow
Pimephales vigilax	Bullhead Minnow
Semotilus atromaculatus	Creek Chub
Cyprinella camura	Bluntface Shiner
Cyprinella lutrensis	Red Shiner
Erimystax x-punctatus	Gravel Chub
Luxilus cardinalis	Cardinal Shiner
Luxilus cornutus	Common Shiner
Lythrurus umbratilis	Redfin Shiner
Macrhybopsis gelida	Sturgeon Chub
Macrhybopsis storeriana	Silver Chub
Macrhybopsis hyostoma	Speckled Chub
Carpiodes carpio	River Carpsucker
Carpiodes cyprinus	Quillback
Catostomus commersoni	White Sucker
Cycleptus elongatus	Blue Sucker

SCIENTIFIC NAME	COMMON NAME
Ictiobus bubalus	Smallmouth Buffalo
Ictiobus cyprinellus	Bigmouth Buffalo
Ictiobus niger	Black Buffalo
Minytrema melanops	Spotted Sucker
Moxostoma carinatum	River Redhorse
Moxostoma erythrurum	Golden Redhorse
Moxostoma macrolepidotum	Shorthead Redhorse
Ictalurus furcatus	Blue Catfish
Ictalurus punctatus	Channel Catfish
Noturus flavus	Stonecat
Noturus nocturnus	Freckled Madtom
Noturus placidus—Threatened	Neosho Madtom
Noturus exilis	Slender Madtom
Pylodictis olivaris	Flathead Catfish
Ameiurus melas	Black Bullhead
Ameiurus natalis	Yellow Bullhead
Fundulus notatus	Blackstripe Topminnow
Fundulus zebrinus	Plains Killifish
Gambusia affinis	Western Mosquitofish
Labidesthes sicculus	Brook Silverside
Morone chrysops	White Bass
Morone saxatilis	Striped Bass
Lepomis cyanellus	Green Sunfish
Lepomis humilis	Orangespotted Sunfish
Lepomis macrochirus	Bluegill
Micropterus dolomieu	Smallmouth Bass
Micropterus punctulatus	Spotted Bass
Micropterus salmoides	Largemouth Bass
Pomoxis annularis	White Crappie
Pomoxis nigromaculatus	Black Crappie
Etheostoma cragini	Arkansas Darter
Etheostoma flabellare	Fantail Darter
Etheostoma nigrum	Johnny Darter
Etheostoma spectabile	Orangethroat Darter
Etheostoma whipplei	Redfin Darter
Perca flavescens	Yellow Perch
Percina caprodes	Logperch
Percina copelandi	Channel Darter
Percina maculata	Blackside Darter
Percina phoxocephala	Slenderhead Darter
Stizostedion vitreum	Walleye
Aplodinotus grunniens	Freshwater Drum

SCIENTIFIC NAME	COMMON NAME
Birds	
Anseriformes • Anatidae • Anserinae	**Geese**
Anser albifrons	Greater White-fronted Goose
Chen caerulescens	Snow Goose
Chen rossii	Ross's Goose
Branta bernicla	Brant
Branta canadensis	Canada Goose
Anseriformes • Anatidae • Anatinae	**Ducks**
Aix sponsa	Wood Duck
Anas strepera	Gadwall
Anas americana	American Wigeon
Anas rubripes	American Black Duck
Anas platyrhynchos	Mallard
Anas discors	Blue-winged Teal
Anas clypeata	Northern Shoveler
Anas acuta	Northern Pintail
Anas crecca	Green-winged Teal
Aythya valisineria	Canvasback
Aythya americana	Redhead
Aythya collaris	Ring-necked Duck
Aythya marila	Greater Scaup
Aythya affinis	Lesser Scaup
Melanitta fusca	White-winged Scoter
Bucephala albeola	Bufflehead
Bucephala clangula	Common Goldeneye
Lophodytes cucullatus	Hooded Merganser
Mergus merganser	Common Merganser
Oxyura jamaicensis	Ruddy Duck
Galliformes • Odontophoridae	**New World Quails**
Colinus virginianus	Northern Bobwhite Quail
Galliformes • Phasianidae • Phasianinae	**Pheasants**
Phasianus colchicus	Ring-necked Pheasant
Galliformes • Phasianidae • Tetraoninae	**Grouses**
Tympanuchus cupido	Greater Prairie-Chicken
Galliformes • Phasianidae • Meleagridinae	**Turkeys**
Meleagris gallopavo	Wild Turkey
Gaviiformes • Gaviidae	**Loons**
Gavia immer	Common Loon
Podicipediformes - Podicipedidae	**Grebes**
Podilymbus podiceps	Pied-billed Grebe
Podiceps auritus	Horned Grebe
Podiceps nigricollis	Eared Grebe

SCIENTIFIC NAME	COMMON NAME
Pelecaniformes • Pelecanidae	**Pelicans**
Pelecanus erythrorhynchos	American White Pelican
Pelecaniformes • Phalacrocoracidae	**Cormorants**
Phalacrocorax auritus	Double-crested Cormorant
Ciconiiformes - Ardeidae	**Bitterns, Herons, and Egrets**
Botaurus lentiginosus	American Bittern
Ixobrychus exilis	Least Bittern
Ardea herodias	Great Blue Heron
Ardea alba	Great Egret
Egretta thula	Snowy Egret
Egretta caerulea	Little Blue Heron
Bubulcus ibis	Cattle Egret Héron
Butorides virescens	Green Heron
Nycticorax nycticorax	Black-crowned Night-Heron
Nyctanassa violacea	Yellow-crowned Night-Heron
Ciconiiformes • Threskiornithidae • Threskiornithinae	**Ibises and Spoonbills**
Plegadis chihi	White-faced Ibis
Falconiformes • Cathartidae	**New World Vultures**
Coragyps atratus	Black Vulture
Cathartes aura	Turkey Vulture
Falconiformes • Accipitridae • Pandioninae	**Ospreys**
Pandion haliaetus	Osprey
Falconiformes • Accipitridae • Accipitrinae	**Hawks and Eagles**
Elanoides forficatus	Swallow-tailed Kite
Ictinia mississippiensis	Mississippi Kite
Haliaeetus leucocephalus	Bald Eagle
Circus cyaneus	Northern Harrier
Accipiter striatus	Sharp-shinned Hawk
Accipiter cooperii	Cooper's Hawk
Buteo platypterus	Broad-winged Hawk
Buteo swainsoni	Swainson's Hawk
Buteo jamaicensis	Red-tailed Hawk
Buteo regalis	Ferruginous Hawk
Buteo lagopus	Rough-legged Hawk
Falconiformes • Falconidae • Falconinae	**Falcons**
Falco sparverius	American Kestrel
Falco columbarius	Merlin
Falco peregrinus	Peregrine Falcon
Falco mexicanus	Prairie Falcon
Gruiformes • Rallidae	**Rails**
Laterallus jamaicensis	Black Rail
Rallus elegans	King Rail
Rallus limicola	Virginia Rail

SCIENTIFIC NAME	COMMON NAME
Porzana carolina	Sora
Fulica americana	American Coot
Gruiformes • Gruidae • Gruinae	**Cranes**
Grus americana—Endangered	Whooping Crane
Charadriiformes • Charadriidae • Charadriinae	**Plovers**
Pluvialis squatarola	Black-bellied Plover
Pluvialis dominica	American Golden-Plover
Charadrius alexandrinus	Snowy Plover
Charadrius semipalmatus	Semipalmated Plover
Charadrius melodus	Threatened Piping Plover
Charadrius vociferous	Killdeer
Charadriiformes • Recurvirostridae	**Stilts and Avocets**
Himantopus mexicanus	Black-necked Stilt
Recurvirostra americana	American Avocet
Charadriiformes • Scolopacidae • Scolopacinae	**Sandpipers**
Actitis macularius	Spotted Sandpiper
Tringa solitaria	Solitary Sandpiper
Tringa melanoleuca	Greater Yellowlegs
Tringa semipalmata	Willet
Tringa flavipes Lesser	Yellowlegs
Bartramia longicauda	Upland Sandpiper
Numenius americanus	Long-billed Curlew
Limosa haemastica	Hudsonian Godwit
Limosa fedoa	Marbled Godwit
Calidris alba	Sanderling
Calidris pusilla	Semipalmated Sandpiper
Calidris mauri	Western Sandpiper
Calidris minutilla	Least Sandpiper
Calidris fuscicollis	White-rumped Sandpiper
Calidris bairdii	Baird's Sandpiper
Calidris melanotos	Pectoral Sandpiper
Calidris alpina	Dunlin
Calidris himantopus	Stilt Sandpiper
Tryngites subruficollis	Buff-breasted Sandpiper
Limnodromus griseus	Short-billed Dowitcher
Limnodromus scolopaceus	Long-billed Dowitcher
Gallinago gallinago	Common Snipe
Scolopax minor	American Woodcock
Charadriiformes • Scolopacidae • Phalaropodinae	**Phalaropes**
Phalaropus tricolor	Wilson's Phalarope
Phalaropus lobatus	Red-necked Phalarope
Charadriiformes • Laridae • Larinae	**Gulls**
Xema sabini	Sabine's Gull

SCIENTIFIC NAME	COMMON NAME
Chroicocephalus philadelphia	Bonaparte's Gull
Leucophaeus atricilla	Laughing Gull
Leucophaeus pipixcan	Franklin's Gull
Larus delawarensis	Ring-billed Gull
Larus argentatus	Herring Gull
Larus hyperboreus	Glaucous Gull
Charadriiformes • Laridae • Sterniae	**Terns**
Sternula antillarum anthalassos–Endangered	Interior Least Tern
Hydroprogne caspia	Caspian Tern
Chlidonias niger	Black Tern
Sterna forsteri	Forster's Tern
Columbiformes • Columbidae	**Ducks**
Zenaida macroura	Mourning Dove
Cuculiformes • Cuculidae • Cuculinae	**Cuckoos**
Coccyzus americanus	Yellow-billed Cuckoo
Coccyzus erythropthalmus	Black-billed Cuckoo
Strigiformes • Tytonidae	**Barn Owls**
Tyto alba	Barn Owl
Strigiformes • Strigidae	**Typical Owls**
Megascops asio	Eastern Screech-Owl
Bubo virginianus	Great Horned Owl
Bubo scandiacus	Snowy Owl
Athene cunicularia	Burrowing Owl
Strix varia	Barred Owl
Asio otus	Long-eared Owl
Asio flammeus	Short-eared Owl
Caprimulgiformes • Caprimulgidae • Chordeilinae	**Nightjars**
Chordeiles minor	Common Nighthawk
Phalaenoptilus nuttallii	Common Poorwill
Apodiformes • Apodidae • Chaeturinae	**Spine-tailed Swifts**
Chaetura pelagica	Chimney Swift
Apodiformes • Trochilidae • Trochilinae	**Hummingbirds**
Archilochus colubris	Ruby-throated Hummingbird
Coraciiformes • Alcedinidae • Cerylinae	**Kingfishers**
Megaceryle alcyon	Belted Kingfisher
Piciformes • Picidae • Picinae	**Woodpeckers**
Melanerpes erythrocephalus	Red-headed Woodpecker
Melanerpes carolinus	Red-bellied Woodpecker
Sphyrapicus varius	Yellow-bellied Sapsucker
Picoides pubescens	Downy Woodpecker
Passeriformes • Tyrannidae • Fluvicolinae	**Flyvicoline Flycatchers**
Contopus cooperi	Olive-sided Flycatcher
Contopus sordidulus	Western Wood-Pewee

SCIENTIFIC NAME	COMMON NAME
Contopus virens	Eastern Wood-Pewee
Empidonax virescens	Acadian Flycatcher
Empidonax traillii	Willow Flycatcher
Empidonax minimus	Least Flycatcher
Sayornis phoebe	Eastern Phoebe
Passeriformes • Tyrannidae • Tyranninae	**Tyrannine Flycatchers**
Myiarchus crinitus	Great Crested Flycatcher
Tyrannus verticalis	Western Kingbird
Tyrannus tyrannus	Eastern Kingbird
Tyrannus forficatus	Scissor-tailed Flycatcher
Passeriformes • Laniidae	**Shrikes**
Lanius ludovicianus	Loggerhead Shrike
Passeriformes • Vireonidae	**Vireos**
Vireo griseus	White-eyed Vireo
Vireo bellii	Bell's Vireo
Vireo flavifrons	Yellow-throated Vireo
Vireo solitarius	Blue-headed Vireo
Vireo gilvus	Warbling Vireo
Vireo philadelphicus	Philadelphia Vireo
Vireo olivaceus	Red-eyed Vireo
Passeriformes - Corvidae	**Crows, Jays, and Magpies**
Cyanocitta cristata	Blue Jay
Gymnorhinus cyanocephalus	Pinyon Jay
Pica hudsonia	Black-billed Magpie
Passeriformes - Alaudidae	**Larks**
Eremophila alpestris	Horned Lark
Passeriformes • Hirundinidae • Hirundininae	**Swallows**
Progne subis	Purple Martin
Stelgidopteryx serripennis	Northern Rough-winged Swallow
Riparia riparia	Bank Swallow
Passeriformes • Paridae	**Chickadees and Titmice**
Poecile carolinensis	Carolina Chickadee
Baeolophus bicolor	Tufted Titmouse
Passeriformes • Sittidae • Sittinae	**Nuthatches**
Sitta canadensis	Red-breasted Nuthatch
Passeriformes • Certhiidae • Certhiinae	**Tree Creepers**
Certhia Americana	Brown Creeper
Passeriformes • Troglodytidae	**Wrens**
Troglodytes aedon	House Wren
Troglodytes troglodytes	Winter Wren
Passeriformes • Cinclidae	**Dippers**
Cinclus mexicanus	American Dipper

SCIENTIFIC NAME	COMMON NAME
Passeriformes • Regulidae	**Kinglets**
Regulus satrapa	Golden-crowned Kinglet
Regulus calendula	Ruby-crowned Kinglet
Passeriformes • Sylviidae • Polioptilinae	**Gnatcatchers**
Polioptila caerulea	Blue-gray Gnatcatcher
Passeriformes • Turdidae	**Thrushes**
Sialia sialis	Eastern Bluebird
Sialia currucoides	Mountain Bluebird
Myadestes townsendi	Townsend's Solitaire
Catharus fuscescens	Veery
Catharus minimus	Gray-cheeked Thrush
Catharus ustulatus	Swainson's Thrush
Hylocichla mustelina	Wood Thrush
Turdus migratorius	American Robin
Passeriformes • Sturnidae	**Starlings**
Sturnus vulgaris	European Starling
Passeriformes • Motacillidae	**Pipits**
Anthus rubescens	American Pipit
Anthus spragueii	Sprague's Pipit
Passeriformes • Bombycillidae	**Waxwings**
Bombycilla garrulus	Bohemian Waxwing
Bombycilla cedrorum	Cedar Waxwing
Passeriformes • Parulidae	**Wood Warblers**
Vermivora pinus	Blue-winged Warbler
Vermivora chrysoptera	Golden-winged Warbler
Vermivora peregrina	Tennessee Warbler
Vermivora celata	Orange-crowned Warbler
Vermivora ruficapilla	Nashville Warbler
Parula americana	Northern Parula
Dendroica petechia	Yellow Warbler
Dendroica pensylvanica	Chestnut-sided Warbler
Dendroica magnolia	Magnolia Warbler
Dendroica coronata	Yellow-rumped Warbler
Dendroica virens	Black-throated Green Warbler
Dendroica fusca	Blackburnian Warbler
Dendroica dominica	Yellow-throated Warbler
Dendroica palmarum	Palm Warbler
Dendroica castanea	Bay-breasted Warbler
Dendroica striata	Blackpoll Warbler
Mniotilta varia	Black-and-white Warbler
Setophaga ruticilla	American Redstart
Protonotaria citrea	Prothonotary Warbler

SCIENTIFIC NAME	COMMON NAME
Helmitheros vermivorum	Worm-eating Warbler
Seiurus aurocapilla	Ovenbird
Seiurus noveboracensis	Northern Waterthrush
Seiurus motacilla	Louisiana Waterthrush
Oporornis formosus	Kentucky Warbler
Oporornis philadelphia	Mourning Warbler
Geothlypis trichas	Common Yellowthroat
Wilsonia pusilla	Wilson's Warbler
Wilsonia canadensis	Canada Warbler
Icteria virens	Yellow-breasted Chat
Passeriformes • Emberizidae	**Sparrows and Towhees**
Pipilo erythrophthalmus	Eastern Towhee
Spizella arborea	American Tree Sparrow
Spizella passerina	Chipping Sparrow
Spizella pallida	Clay-colored Sparrow
Spizella pusilla	Field Sparrow
Pooecetes gramineus	Vesper Sparrow
Chondestes grammacus	Lark Sparrow
Passerculus sandwichensis	Savannah Sparrow
Ammodramus savannarum	Grasshopper Sparrow
Ammodramus bairdii	Baird's Sparrow
Ammodramus henslowii	Henslow's Sparrow
Ammodramus leconteii	Le Conte's Sparrow
Passerella iliaca	Fox Sparrow
Melospiza melodia	Song Sparrow
Melospiza lincolnii	Lincoln's Sparrow
Melospiza georgiana	Swamp Sparrow
Zonotrichia albicollis	White-throated Sparrow
Zonotrichia querula	Harris's Sparrow
Zonotrichia leucophrys	White-crowned Sparrow
Junco hyemalis	Dark-eyed Junco
Calcarius lapponicus	Lapland Longspur
Calcarius pictus	Smith's Longspur
Calcarius ornatus	Chestnut-collared Longspur
Passeriformes • Cardinalidae	**Tanagers, Cardinals, Grosbeaks, and Allies**
Piranga rubra	Summer Tanager
Piranga olivacea	Scarlet Tanager
Cardinalis cardinalis	Northern Cardinal
Pheucticus ludovicianus	Rose-breasted Grosbeak
Passerina caerulea	Blue Grosbeak
Passerina cyanea	Indigo Bunting
Passerina ciris	Painted Bunting
Spiza americana	Dickcissel

SCIENTIFIC NAME	COMMON NAME
Passeriformes • Icteridae	**Blackbirds and Orioles**
Dolichonyx oryzivorus	Bobolink
Agelaius phoeniceus	Red-winged Blackbird
Sturnella magna	Eastern Meadowlark
Sturnella neglecta	Western Meadowlark
Xanthocephalus xanthocephalus	Yellow-headed Blackbird
Euphagus carolinus	Rusty Blackbird
Euphagus cyanocephalus	Brewer's Blackbird
Quiscalus quiscula	Common Grackle
Quiscalus mexicanus	Great-tailed Grackle
Molothrus ater	Brown-headed Cowbird
Icterus spurius	Orchard Oriole
Icterus galbula	Baltimore Oriole
Passeriformes • Fringillidae • Carduelinae	**Finches**
Carpodacus purpureus	Purple Finch
Loxia curvirostra	Red Crossbill
Acanthis flammea	Common Redpoll
Spinus pinus	Pine Siskin
Spinus tristis	American Goldfinch
Passeriformes • Passeridae	**Old World Sparrows**
Passer domesticus	House Sparrow
Mammals	
Didelphis virginiana	Virginia Opossum
Sorex haydeni	Hayden's Shrew
Cryptotis parva	Least Shrew
Scalopus aquaticus	Eastern Mole
Myotis lucifugus	Little Brown Myotis
Myotis septentrionalis	Northern Myotis
Pipistrellus subflavus	Eastern Pipistrelle
Eptesicus fuscus	Big Brown Bat
Lasiurus borealis	Eastern Red Bat
Lasiurus cinereus	Hoary Bat
Nycticeius humeralis	Evening Bat
Tadarida brasiliensis	Brazilian Free-tailed Bat
Nyctinomops macrotis	Big Free-tailed Bat
Dasypus novemcinctus	Nine-banded Armadillo
Sylvilagus floridanus	Eastern Cottontail
Lepus californicus	Black-tailed Jack Rabbit
Marmota monax	Woodchuck
Spermophilus tridecemlineatus	Thirteen-lined Ground Squirrel
Spermophilus franklinii	Franklin's Ground Squirrel
Cynomys ludovicianus	Black-tailed Prairie Dog
Sciurus carolinensis	Eastern Gray Squirrel

SCIENTIFIC NAME	COMMON NAME
Sciurus niger	Eastern Fox Squirrel
Glaucomys volans	Southern Flying Squirrel
Geomys bursarius	Plains Pocket Gopher
Perognathus flavescens	Plains Pocket Mouse
Chaetodipus hispidus	Hispid Pocket Mouse
Castor canadensis	American Beaver
Reithrodontomys montanus	Plains Harvest Mouse
Reithrodontomys megalotis	Western Harvest Mouse
Peromyscus maniculatus	Deer Mouse
Peromyscus leucopus	White-footed Mouse
Peromyscus attwateri	Texas Mouse
Onychomys leucogaster	Northern Grasshopper Mouse
Sigmodon hispidus	Hispid Cotton Rat
Neotoma floridana	Eastern Woodrat
Microtus ochrogaster	Prairie Vole
Microtus pinetorum	Woodland Vole
Synaptomys cooperi	Southern Bog Lemming
Zapus hudsonius	Meadow Jumping Mouse
Erethizon dorsatum	Common Porcupine
Canis latrans	Coyote
Vulpes vulpes	Red Fox
Urocyon cinereoargenteus	Common Gray Fox
Procyon lotor	Common Raccoon
Mustela nivalis	Least Weasel
Mustela frenata	Long-tailed Weasel
Mustela vison	Mink
Taxidea taxus	American Badger
Spilogale putorius	Eastern Spotted Skunk
Mephitis mephitis	Striped Skunk
Puma concolor	Mountain Lion
Odocoileus virginianus	White-tailed Deer
Antilocapra americana	Pronghorn

Appendix B

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Reviewer's Name	*Position*	*Work Unit*
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Appendix C

Finding of No Significant Impact

U.S. Department of the Interior
FISH AND WILDLIFE SERVICE
Region 6, Denver, Colorado

FINDING OF NO SIGNIFICANT IMPACT

Flint Hills Legacy Conservation Area

Butler, Chase, Chautauqua, Clay, Cowley, Dickinson, Elk, Geary, Greenwood, Harvey, Jackson, Lyon, Marion, Marshall, Morris, Pottawatomie, Riley, Shawnee, Washington, Woodson and Waubansee Counties, Kansas

The U.S. Fish and Wildlife Service has completed the *Environmental Assessment and Land Protection Plan, Flint Hills Legacy Conservation Area.* The Environmental Assessment evaluates two alternatives, including a No Action Alternative, and the subsequent environmental consequences of establishing the Flint Hills Legacy Conservation Area.

Alternative B, the preferred alternative, was selected for implementation because it best meets the Service's objective to maintain tallgrass prairie habitat integrity for wildlife on a landscape-scale. The Flint Hills Legacy Conservation Area has been proposed to help protect the Flint Hills tallgrass prairie from being drastically changed by widespread, unplanned residential or commercial development, and the further encroachment of woody plants. This proposal also would benefit the American public by protecting wildlife, water quality and open space.

The following is a summary of anticipated environmental effects from implementation of the preferred alternative:

1. Establishing the Flint Hills Legacy Conservation Area would provide for the conservation of up to 1,100,000 acres of important habitat on private land. This project would help maintain the uniqueness of the Flint Hills region and complement other conservation efforts by Ranchland Trust of Kansas, Kansas Livestock Association, Kansas Land Trust, Tallgrass Legacy Alliance, The Nature Conservancy, the Kansas Department of Wildlife and Parks, and other state and federal agencies.

2. Conservation easements within the Flint Hills Legacy Conservation Area would help alleviate habitat fragmentation issues. Maintaining key biological linkages would facilitate wildlife movement and provide for wildlife habitat requirements, particularly wintering and migrational habitat for migratory birds such as the Henslow's sparrow, American golden-plover, grasshopper sparrow, dickcissel, upland sandpiper, buff-breasted sandpiper, scissor-tailed flycatcher, Smith's longspur, Harris' sparrow, Swainson's hawk, northern harrier, and indicator resident species such as the greater prairie-chicken. In addition, a number of aquatic species will benefit from the protection of the prairie and its associated riparian corridors. The project area contains many of the state's most pristine surface waters (e.g., Dodds and Oakes 2004) and supports a rich variety of native fish (over 80 species), and shellfish, including the world's largest remaining populations of the federally protected Topeka shiner and Neosho madtom (Haslouer et al. 2005, Angelo et al. 2002a, 2009).

3. Water resources on 1,100,000 acres would be protected from increased non-point source pollution from residential subdivision and commercial development which are prohibited under the proposed

easement program. This project will help reduce the demand for potable water associated with new subdivisions and the challenges to water rights that may follow.

4. The proposed action would affect location and distribution, but not rate or density, of human population growth. Positive effects may occur from increased public wildlife viewing, and hunting opportunities. Open space also may enhance property values on adjoining lands as people begin to seek out undeveloped lands in the future.

5. The Service, within the approved project boundary, would create no additional land-use regulations. The purchase of an easement would not result in a transfer of land title, and private landowners would continue to pay property taxes.

Preventing subdivision and development could decrease future tax revenues in certain market areas. However, open space could actually provide a net savings to local governments when compared to the revenues generated and costs of services associated with residential development (Haggerty 1996).

6. The proposed easement program would not preclude energy development on private land. When acquiring easements on properties where wind, oil and gas, or mineral rights have already been sold and severed from the estate, the Service will work with landowners and developers to minimize any negative impacts of development activities (50 CFR § 25.11). On land where the rights for wind, oil and gas, or mineral development have not been sold and where the estate is still intact, conservation easements would require nonsurface occupancy, or off-site development, for any future development activities.

The Service would consider energy development on the easement properties, if they can be implemented without disturbing the surface or creating vertical barriers which would fragment the grassland habitat for wildlife. Easements would contain reasonable surface stipulations for new development actions such as non-surface occupancy, revegetation of disturbed areas, access, and site reclamation.

7. Conservation easements purchased on private tracts would not change the landowner's right to manage public access to their property. Private landowners would retain full control over their property access rights, including allowing or restricting hunting and fishing on their lands, under the proposed easement program.

8. Through the proposed easement program, approximately 1,100,000 acres of privately owned native grassland habitats would be added to the 90,500 acres of federal, state and privately owned lands within the project area that already have some level of protection. This would have long-term positive impacts on wildlife habitat and result in the long-term conservation of migratory birds, threatened and endangered species, native plants, and the overall biological diversity in the Flint Hills tallgrass prairie region.

As part of the public scoping process associated with this action, comments were solicited from the public through news releases and public meetings. Open houses were held in Alma, Cottonwood Falls, El Dorado, and Wichita. Public comments were taken to identify issues to be analyzed for the proposed project. Approximately 199 landowners, citizens, and elected representatives attended the meetings, and most expressed positive support for the project.

In addition, the Service's field staff has contacted local government officials, other public agencies, and conservation groups, all of which have expressed an interest in and a desire to protect the Flint Hills from the pressures brought about by rural subdivisions.

Thus, this EA has taken a hard look at the environmental impacts to inform the public and ourselves about the consequences of the proposed action. Environmental consequences will be beneficial to grassland habitat, migratory birds, water quality, and native fish and mussels. While the proposal to establish the Flint Hills Legacy Conservation Area will largely preserve the current state of the natural environment and prevent degradation, there may be some reduction in energy development requiring surface occupancy, that would otherwise occur, but for the easements proposed by the Fish and Wildlife Service. Substantive conflict is not apparent over these land use issues; the vast majority of verbal and written comments received during scoping meetings and on the environmental assessment were in favor of the establishment of the Flint Hills Legacy Conservation Area through the use of voluntary conservation easements.

In determining whether this project is a major action significantly[1] affecting the quality of the human environment, we looked at both the context and intensity of the action (40 CFR § 1508.27, 40 CFR § 1508.14) as required by NEPA. In terms of context, the proposed action will occur in eastern Kansas, but we have evaluated whether it may have effects to the human environment[2] on a broader scale, particularly in regard to wind energy development and grassland bird populations. The project will be implemented over time dependent upon the Fish and Wildlife Service's ability to obtain the funding needed for easement acquisitions. Of the 3.3 million acres of tallgrass habitat within the boundary area, 1.1 million acres may be entered into voluntary easements with the Service, on a strictly voluntary basis with willing sellers only. Therefore, in evaluating the intensity, or severity of the impact of the proposed action, we looked at the remaining potential area for wind energy development throughout the state of Kansas. The 1.1 million acres constitute a small portion (2.34%) of the state of Kansas available for wind energy development. In fact, over 89% of the state has the potential for wind energy development most of which will still be available for development regardless of the proposed action. In contrast, migratory grassland birds, which will benefit by the proposed action, are the fastest declining guild of birds in North America. Those that require tallgrass prairie have only this area of approximately 4% of the remaining tallgrass prairie habitat to rely on to sustain healthy populations.

Because the human environment is interpreted by the National Environmental Policy Act to mean the natural and physical environment and the relationship of people with that environment (40 CFR § 1508.14), in addition to our thorough analysis of physical environmental effects, we carefully assessed the manner in which the local people relate to the environment in the Flint Hills. Economic or social effects are not intended by themselves to require the preparation an environmental impact statement (40 CFR § 1508.14). The location of the proposed action is largely rural and dominated by agricultural industries, mainly ranching. The vast majorities of commentators on the Flint Hills Legacy Conservation Area project supported the proposed action indicating in various comments that it would help them to relate to their natural and physical environment in much the same way they do now- via a ranching economy. Those who are interested in pursuing other economic development opportunities, such as wind energy, will not be precluded from doing so because the proposed action involves easements acquired on a voluntary basis only.

Therefore, in consideration of the fact that the Fish and Wildlife Service's conservation easement approach has a proven track record of effectiveness and minimal controversy due to its fundamental basis of voluntary participation to accomplish mutual goals of the Service and landowners, the compelling science in support of the project, and my review and evaluation of the information contained in the supporting reference, I have determined that establishing an executive boundary for the Flint Hills

Legacy Conservation Area is not a major federal action that would significantly affect the quality of the human environment within the meaning of Section 102(2)(C) of the National Environmental Policy Act of 1969.

The Finding of No Significant Impact (FONSI) and supporting assessment will be available to the public. Copies of the Environmental Assessment are available for all affected landowners, agencies, private groups, and other interested parties.

The FONSI, Environmental Assessment, and other supporting documents are on file at the U.S. Fish and Wildlife Service, Refuges, Division of Planning, P.O. Box 25486-DFC, Denver, Colorado 80225 (telephone 303-236-4345). They are available for public inspection upon request.

Supporting Reference

U.S. Fish and Wildlife Service. 2010. *Environmental Assessment and Land Protection Plan, Flint Hills Legacy Conservation Area,* Denver, Colorado.

Regional Director, Region 6
U.S. Fish and Wildlife Service

7/30/10
Date

[1] 40 CFR § 1508.27 "Significantly" as used in NEPA requires considerations of both context and intensity: (a) Context. This means that the significance of an action must be analyzed in several contexts such as society as a whole (human, national), the affected region, the affected interests, and the locality. Significance varies with the setting of the proposed action. For instance, in the case of a site-specific action, significance would usually depend upon the effects in the locale rather than in the world as a whole. Both short- and long-term effects are relevant; and (b) Intensity. This refers to the severity of impact. Responsible officials must bear in mind that more than one agency may make decisions about partial aspects of a major action.

[2] 40 CFR § 1508.14 "Human environment" shall be interpreted comprehensively to include the natural and physical environment and the relationship of people with that environment. (See the definition of "effects" (40 CFR § 1508.8).) This means that economic or social effects are not intended by themselves to require preparation of an environmental impact statement. When an environmental impact statement is prepared and economic or social and natural or physical environmental effects are interrelated, then the environmental impact statement will discuss all of these effects on the human environment.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Washington, D.C. 20240

SEP 0 8 2010

In Reply Refer To:
FWS/ANRS-NRCP/045895

Memorandum

To: Regional Director, Region 6

From: Acting Director Paul R. Schmidt

Subject: Approval to Proceed with Publication and Distribution of the Final Planning Documents for a New Unit of the National Wildlife Refuge System, Flint Hills Legacy Conservation Area, to be located in eastern Kansas.

I concur with your findings and authorize this new unit of the system referenced in record 045895 within the data tracking system.

Your thorough job with the Environmental Assessment (EA) and Finding of No Significant Impact is recognized (FONSI). I am extremely excited about landscape projects such as this that strive to protect large areas for the conservation of fish and wildlife species. Your proposal for acquisition appears to embrace the principles of strategic habitat conservation.

However, prior to proceeding with any easement or fee acquisitions I would like the region to provide me with a detailed briefing demonstrating application of the spatially-explicit processes of biological planning and conservation design that are well described conceptually in section 5 of the EA. I expect that this briefing will show how available data will be used to target acquisitions to ensure progress toward the explicit population goals that are described in the EA.

I thank you for the hard work in preparing the EA and look forward to working with you on this exciting project.

Appendix D

Compliance Certificate

U.S. Fish and Wildlife Service
Region 6
Denver, Colorado

ENVIRONMENTAL ACTION STATEMENT

Within the spirit and intent of the Council on Environmental Quality's regulations for implementing the National Environmental Policy Act (NEPA) and other statutes, orders, and policies that protect fish and wildlife resources, I have established the following administrative record and have determined that the action of establishing an executive boundary for the Flint Hills Legacy Conservation Area:

_ is a categorical exclusion as provided by 516 DM 2, Appendices 1 and 2, and 516 DM 6, Appendix 1. No further documentation will be made.
X is found not to have significant environmental effects as determined by the attached Finding of No Significant Impact and Environmental Assessment.
_ is found to have special environmental conditions as described in the attached environmental assessment. The attached Finding of No Significant Impact will not be final nor any actions taken pending a 30-day period for public review [40CFR 1501.4(e)(2)].
_ is found to have significant effects and, therefore, a notice of intent will be published in the *Federal Register* to prepare an environmental impact statement before the project is considered further.
_ is denied because of environmental damage, Service policy, or mandate.
_ is an emergency situation. Only those actions necessary to control the immediate impacts of the emergency will be taken. Other related actions remain subject to NEPA review.

Other supporting document:

Environmental Assessment and Land Protection Plan, Flint Hills Legacy Conservation Area

Richard A Coleman — 7/30/10

Assistant Regional Director — Date
National Wildlife Refuge System, Region 6

Steph Guertin — 7/30/10

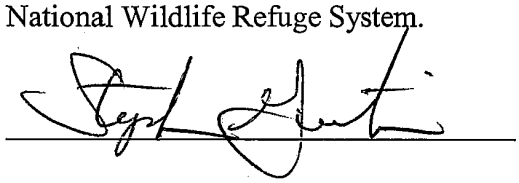
Regional Director, Region 6 — Date
U.S. Fish and Wildlife Service

U.S. Fish and Wildlife Service, Region 6
ENVIRONMENTAL COMPLIANCE CERTIFICATE

PROJECT: **Flint Hills Legacy Conservation Area**
STATE: **Kansas**

ACTION (indicate if not applicable)	DATE
NEPA (National Environmental Policy Act)(indicate one)	
Categorical Exclusion	N/A
Environmental Assessment/Finding of No Significant Impact	7/09/10
Environmental Impact Statement/Record of Decision	N/A
Executive Order 11593, Protection of Historical, Archaeological, and Scientific Properties	5/18/10
Executive Order 11988, Floodplain Management	5/18/10
Executive Order 11990, Protection of Wetlands	7/8/10
Executive Order 12372, Intergovernmental Review of Federal Programs	7/8/10
Executive Order 12898, Federal Actions to Address Environmental Justice in Minority and Low-Income Populations	5/18/10
Executive Order 12996, Management and General Public Use of the National Wildlife Refuge System	7/8/10
Endangered Species Act, Section 7	4/29/10
Coastal Zone Management Act, Section 307	N/A
Uniform Relocation Assistance and Real Property Acquisition Policies Act	N/A
Level I Contaminants and Hazardous Waste (Secretarial Order 3127: 602DM2)	5/18/10

I hereby certify that all requirements of the law, rules, and Service regulations or policies applicable to planning for the above project have met with compliance. I approve the establishment of an executive boundary for the Flint Hills Legacy Conservation Area to be administered and managed as part of the National Wildlife Refuge System.



7/30/10

Regional Director, Region 6
U.S. Fish and Wildlife Service

Date

STATEMENT OF COMPLIANCE

The following Executive Orders and legislative acts have been reviewed as they apply to the establishment of an executive boundary for the Flint Hills Legacy Conservation Area:

1. **Executive Order 11593. Protection of Historical, Archaeological, and Scientific Properties.** The regional archaeologist determined that the acquisition of easements within the Flint Hills Legacy Conservation Area is not an undertaking under section 106 of the National Historic Preservation Act. In fact, the project has the potential to protect cultural resources. If, in the future, the Service grants a special permit for the landowner under the easement, section 106 may be relevant at that time. If so, the Service will take the necessary steps to address any historical or archaeological issues.

2. **Executive Order 11988. Floodplain Management**. No structures that could be damaged by or that would significantly influence the movement of floodwater are planned for construction by the Fish and Wildlife Service on easements acquired as part of this project.

3. **Executive Order 11990. Protection of Wetlands.** This action is consistent with protection of existing wetland resources from incompatible activities and thereby complies with this executive order.

4. **Executive Order 12372. Intergovernmental Review.** The Service has discussed the proposal to establish the Flint Hills Legacy Conservation Area with landowners; conservation organizations; other federal agencies; tribal, state, and county commissioners; and other interested groups and individuals.

   At the federal level, the Service staff has coordinated with the U.S. Department of Agriculture (Natural Resources Conservation Service), Department of Defense (Fort Riley Army Installation), National Park Service, and the Environmental Protection Agency. At the state level, Governor Parkinson's staff, Senators Brownback and Robert's staff, and the Kansas Department of Wildlife and Parks have been notified of this proposed action and given the opportunity to review the Environmental Assessment. In addition, the Service has provided information to eleven Tribes with potential interest in this project

5. **Executive Order 12898. Federal Actions to Address Environmental Justice in Minority and Low-Income Populations.** Establishing the Flint Hills Legacy Conservation Area will not have a disproportionately high or adverse human health or environmental effect on minority or low-income populations. Therefore, this action complies with this Executive Order.

6. **Executive Order 12996. Management and General Public Use of the National Wildlife Refuge System**. The public has been invited to participate in the planning process and has been very engaged. The Service held a total of six public meetings; three scoping and three open houses to get input on the draft environmental assessment and land protection plan in the project area. Over 100 comments have been received from the public. The public's issues and comments have been incorporated into the Environmental Assessment and a copy of the final document will be sent to all interested landowners, agencies, private groups, and other parties. Since this project will strictly be easement acquisition, the Service will not

manage or have control over public access to the protected lands. This right will remain with the private landowner and therefore a compatibility determination is not needed for this project.

7. **Endangered Species Act, section 7.** An internal section 7 consultation concluded the proposed action would have a No Effect, No Adverse Modification on listed species within the acquisition project area.

8. **Coastal Zone Management Act**. Due to the location of the project area, compliance of this Act was determined not to be needed.

9. **Uniform Relocation Assistance and Real Property Acquisition Policies Act.** Since the Service will not be acquiring any land within the project area in fee-title, no relocation assistance will be needed and no real property acquisition will occur.

10. **Secretarial Order 3127. Contaminants and Hazardous Waste**. A Level 1 pre-acquisition contaminant survey will be completed prior to the purchase of any easement.

I hereby certify that the Service has complied with all requirements of law, rules, or regulations applicable to pre-acquisition planning for the above project. I approve the establishment of an executive boundary for the Flint Hills Legacy Conservation Area and the subsequent acquisition of up to 1,100,000 acres of easements from willing sellers:

Regional Director, Region 6
U.S. Fish and Wildlife Service

Date 7/30/10

Appendix E

Level 1 Report

Due to the large project size, Level 1 Site Assessments will be conducted on a tract-by-tract basis prior to acquisition.

Appendix F

Section 7 Biological Evaluation

INTRA-SERVICE ENDANGERED SPECIES ACT SECTION 7 EVALUATION FORM

Originating Persons: Amy Thornburg
Region 6, Division of Planning, NWRS

Telephone Number: 303-236-4345

Date: 4/29/10

I. Region: Region 6

II. Service Activity: Refuges, Division of Planning, Denver Regional Office

III. Pertinent Species and Habitat

A. Listed species and/or their critical habitat within the 21 county action area:

BUTLER COUNTY		
Topeka shiner	*Notropis topeka*	E
CHASE COUNTY		
Neosho madtom	*Noturus placidus*	T
Topeka shiner	*Notropis topeka*	E
CHAUTAUQUA COUNTY		
American burying beetle	*Nicrophorus americanus*	E
CLAY COUNTY		
(none listed for this county)		
COWLEY COUNTY		
Arkansas darter	*Etheostoma cragini*	C
Interior least tern	*Sterna antillarum*	E
Rabbitsfoot	*Quadrula cylindrica*	C
DICKINSON COUNTY		
Topeka shiner	*Notropis topeka*	E
ELK COUNTY		
American burying beetle	*Nicrophorus americanus*	E

GEARY COUNTY		
Topeka shiner	*Notropis topeka*	E
GREENWOOD COUNTY		
Neosho mucket	*Lampsilis rafinequena*	C
Topeka shiner	*Notropis topeka*	E
Rabbitsfoot	*Quadrula cylindrica*	C
HARVEY COUNTY		
Whooping crane	*Grus americana*	E
JACKSON COUNTY		
(none listed for this county)		T
LYON COUNTY		
Neosho madtom	*Noturus placidus*	T
Topeka shiner	*Notropis topeka*	E
MARION COUNTY		
Neosho madtom	*Noturus placidus*	T
Topeka shiner	*Notropis topeka*	E
MARSHALL COUNTY		
Topeka shiner	*Notropis topeka*	E
MORRIS COUNTY		
Neosho madtom	*Noturus placidus*	T
Topeka shiner	*Notropis topeka*	E
POTTAWATOMIE COUNTY		
Interior least tern	*Sterna antillarum*	E
Piping plover	*Chardarius melodus*	T
Topeka shiner	*Notropis topeka*	E
RILEY COUNTY		
Interior least tern	*Sterna antillarum*	E
Piping plover	*Chardarius melodus*	T
Topeka shiner	*Notropis topeka*	E

SHAWNEE COUNTY		
Interior least tern	*Sterna antillarum*	E
Topeka shiner	*Notropis topeka*	E
WABAUNSEE COUNTY		
Interior least tern	*Sterna antillarum*	E
Piping plover	*Chardarius melodus*	T
Topeka shiner	*Notropis topeka*	E
WASHINGTON COUNTY		
(none listed for this county)		
WOODSON COUNTY		
Neosho madtom	*Noturus placidus*	T
Neosho mucket	*Lampsilis rafinequena*	C
Rabbitsfoot	*Quadrula cylindrica*	C

C - Candidate
T - Threatened
E - Endangered

B. Proposed species and/or their proposed critical habitat within the county / action area:
None

C. Candidate species within the county / action area:
Listed above

IV. Geographic Area/Action

This Intra Section 7 covers the establishment of the Flint Hills Legacy Conservation Area (FHLCA) in portions of 21 counties in eastern Kansas.

V. Location

The site proposed boundary expansion and fee title acquisition (see attached map):

- State of Kansas

A. Counties: Butler, Chase, Chautauqua, Clay, Cowley, Dickinson, Elk, Geary, Greenwood, Harvey, Jackson, Lyon, Marion, Marshall, Morris, Pottawatomie, Riley, Shawnee, Washington, Waubansee and Woodson

- Description of extent of boundary for the new refuge:

The proposed boundary for the FHLCA includes a narrow band of tallgrass prairie that extends from the northern to the southern border of the state in eastern Kansas. The boundary area includes approximately 3.3 million acres within the Flint Hills Ecoregion of Kansas, (EPA Omernick). This remaining, high quality, ecologically functioning stretch of tallgrass prairie runs along a north-south axis averaging as narrow as 20 miles wide (see attached map).

VI. Description of the Proposed Action

The Service is proposing to establish the Flint Hills Legacy Conservation Area in order to protect important tallgrass prairie and associated riparian habitat, and key migration corridors for migratory birds. The Service is evaluating a proposal to acquire perpetual conservation easements from willing sellers on up to 1.1 million acres of tallgrass prairie in eastern Kansas.

Less than 4 percent of the once vast tallgrass prairie region remains. Cultivation, agriculture, tree encroachment, and development activities have pushed grassland-dependent species into ever-shrinking areas of tallgrass prairie. Approximately three-quarters of the remaining tallgrass prairie located within the Flint Hills ecoregion of eastern Kansas and northeastern Oklahoma, with about 3.5 million acres present in the Kansas portion of the Flint Hills. The outer edge of this region is presently suffering a rapid conversion to forest due in part to a declining fire culture within the agricultural communities of the region. The intact, inner core of this region is approximately 3.3 million acres in size. It is within this project boundary, the Service intends to acquire perpetual conservation easements.

VII. Determination of Effects

At the federal level, nine Flint Hills species are listed as threatened and endangered, or are candidates for listing: these include the American burying beetle, western prairie-fringed orchid, piping plover, Topeka shiner, least tern, whooping crane, Neosho madtom, and the Arkansas River shiner. Species that are candidate for listing include the rabbitsfoot mussel, Arkansas darter and Neosho mucket.

The proposed creation of the Flint Hills Legacy Conservation Area will have a beneficial effect on species listed in section III. One of the purposes for the establishment of the FHLCA is to support the recovery and protection of threatened and endangered species, and to reduce the likelihood of future listings under the Endangered Species Act.

The project will provide for the conservation of up to 1,100,000 acres of the only remaining landscape-scale expression of tallgrass prairie. This program would protect essential tallgrass habitat, and prairie-dependent resident and migratory wildlife species from the threats of a variety of fragmentation sources. Prioritization of areas considered for conservation easements within the 3.3 million project area will be based on the biological needs of the wildlife species of concern, (grassland-dependent migratory birds and threatened and endangered species), the threat of development, connectivity with other protected lands, and quality of native tallgrass prairie habitat for trust species.

The Flint Hills region provides habitat integral to larger national conservation efforts. The region is a north-south migration linkage for many grassland birds, the fastest declining avian cadre in North America. The Flint Hills tallgrass region provides essential habitat for numerous grassland bird species, including greater prairie-chicken, Henslow's sparrow, short-eared owl, Bell's vireo, American golden-plover, grasshopper sparrow, dickcissel, eastern meadowlark, upland sandpiper, buff-breasted sandpiper, scissor-tailed flycatcher, loggerhead shrike, Smith's longspur, Harris' sparrow, Swainson's hawk and northern harrier

In addition, the project area contains many of the state's most pristine surface waters, many of which currently serve as ecological "reference" systems in environmental monitoring programs administered by state and federal natural resource agencies (e.g., Kansas Department of Health and Environment 2007). These streams support a rich variety of native fish (over 80 species) and shellfish, including the world's largest remaining populations of the federally protected Topeka shiner and Neosho madtom.

Uplands and stream corridors provide habitat for many small mammals including shrews, mice, voles, pocket gophers, ground squirrels, weasels, mink, and bats. These mammals provide critical food sources for prairie raptors such as bald eagles, ferruginous hawks, northern harriers, prairie falcons, and short-eared owls. Big game animals such as white-tailed deer, pronghorn, and the occasional mule deer use the upland prairie habitat. Mountain lion, badger, bobcat, coyote, red fox are examples of carnivores that occur throughout the project area.

Adding the Flint Hills Legacy Conservation Area to the refuge system will provide important connectivity between areas already under protection in the region, and will maintain the north-south migration corridor for grassland birds in eastern Kansas.

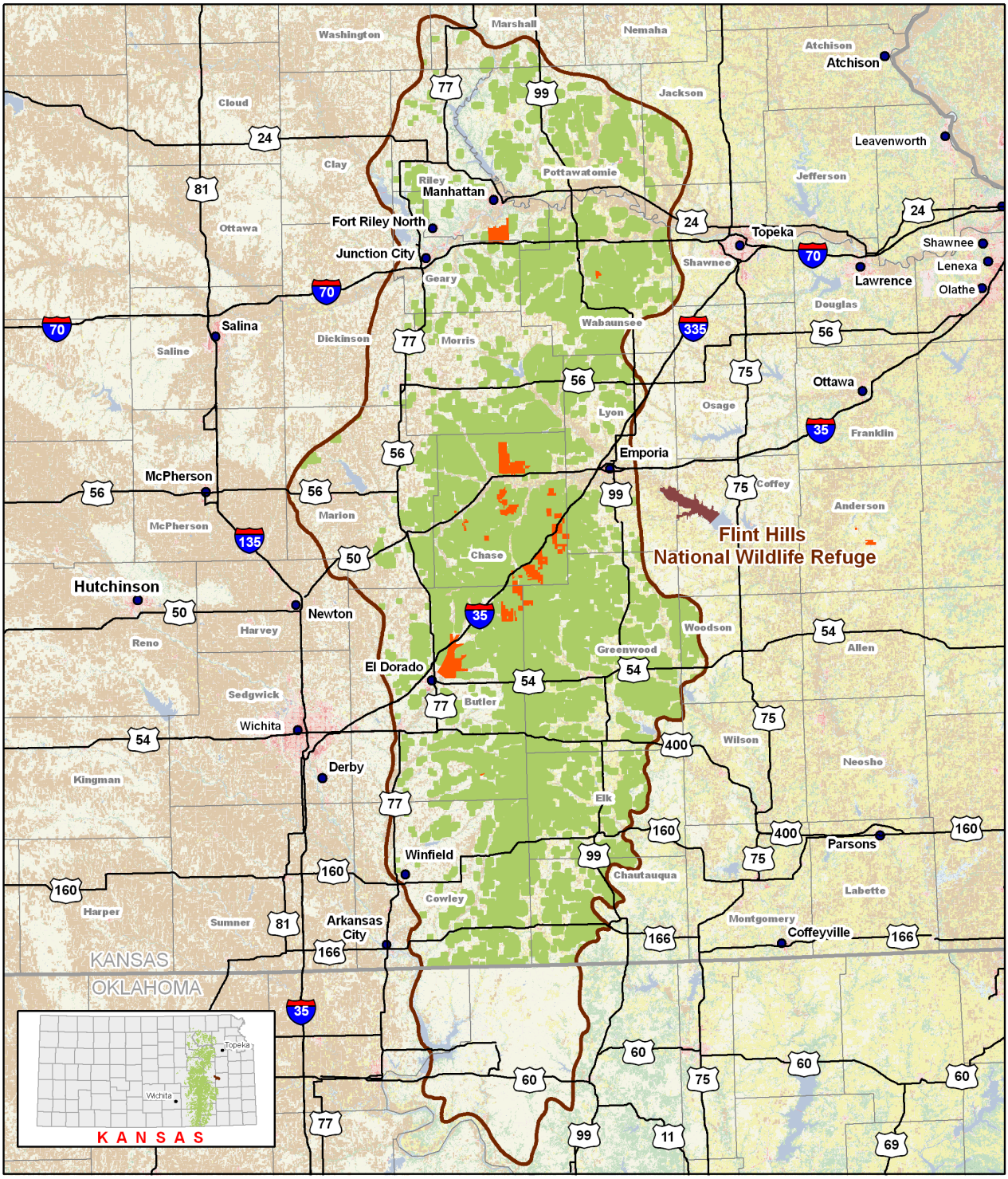
The creation of the FHLCA will provide an opportunity to protect historically important tallgrass prairie and associated riparian habitats. Without the protection of private land with conservation easements, the future of tallgrass habitat for wildlife in the project area would be uncertain.

U.S. Fish & Wildlife Service

Flint Hills Legacy Conservation Area

Eastern Kansas

Base Map



Flint Hills Legacy CA

Existing Conservation

Flint Hills Ecoregion

PRODUCED IN THE DIVISION OF REFUGE PLANNING
DENVER, COLORADO
MAP DATE: 04/06/10
BASEMAP: N/A
W:/KS/FLH_LEGACY/MAPS/FLH_LGCY_BASE_040610.MXD

0 25 50 Miles

0 25 50 Kilometers

N

UTM ZONE 14
NAD 83

VIII. Effects Determination and Response Requested

A. *Listed Species / designed critical habitat*

No Effect / no adverse modification	✓ Concurrence
May affect, but is not likely to adversely affect species / modify critical habitat	____Concurrence
May affect, and is likely to adversely affect species / modify critical habitat	____Formal Consultation

B. Proposed Species / proposed critical habitat

No effect on proposed species / no adverse modification of proposed critical habitat (species: none)	____Concurrence
Is likely to jeopardize proposed species or adversely modify proposed critical habitat (species: none)	____Concurrence

Amy Thornburg
Land Protection Planning Team Lead
Division of Planning
National Wildlife Refuge System
Region 6

IX. Reviewing ESO Evaluation

✓ Concurrence

____Non-Concurrence

____Formal Consultation Required

____Conference Required

____Informal Conference Required

Michael J. LeValley
Kansas Ecological Services Field Office Supervisor

Appendix G

Comments and Responses

General Support

Comment 1. *I like the landscape/regional-scale approach that should result in a regional awareness of the need for conservation across the area. I like the voluntary nature of conservation easements.*

Response 1. *T*he U.S. Fish and Wildlfe Service (Service) agrees that a regional approach will be critical to conservation of the tallgrass prairie and grassland-dependent wildlife species.

It is Service policy to seek easements from willing sellers only.

Comment 2. *I strongly support the U.S. Fish and Wildlife's plan to purchase conservation easements as described in your draft EA and land protection plan. This is a very effective way of protecting the wildlife habitat in the Flint Hills, allowing for consistent corridors for birds and wildlife. It will provide protection for an extremely endangered ecosystem—the tallgrass prairie. It also allows for the local ranching economy to participate in one's own destiny, without compromising outright ownership. From a political and conservation standpoint, I applaud the plan. Please register my support for the plan.*

Response 2. Thank you for your comments.

Comment 3. *You did a good job on the meetings I attended as well as the drafts presented. I think the initiative is a very positive one. Thank you.*

Response 3. Thank you for your comments.

Comment 4. *We support the draft of the USF&WS [U.S. Fish and Wildlife Service] Flint Hills Legacy Conservation Area initiative and applaud their efforts to preserve the Flint Hills tallgrass prairie.*

Response 4. Thank you for your comments.

Comment 5. *You presented at Alma, Kansas last week and I wanted to thank you for your excellent presentation and answers to our questions.*

I also wanted to thank [the U.S.] Fish and Wildlife [Service] for this superb effort. The draft plan and environmental assessment look excellent. We are especially pleased with the affirmation of good prairie management (fire, etc.) and the banning of destructive intrusions, such as industrial-scale wind facilities. We in the Flint Hills are so encouraged by this effort that could make a hugely significant difference for wildlife in the tallgrass prairie.

Response 5. Thank you for your comments.

Comment 6. *[I am pleased about] protecting the Flint Hills of Kansas.*

Response 6. Thank you for your comments.

Comment 7. *I was unable to attend any of the meetings, but I read completely the land protection plan and environmental assessment. I am very supportive of them in their entirety. I believe that this is a very well-conceived plan that may be the best way to achieve the goals of effective large scale conservation in the Flint Hills, to the landscape objectives mentioned. I am hopeful that this will be successfully implemented. Please keep up the communication as to progress and issues being encountered, and help needed.*

Response 7. Thank you for your comments.

As a part of communication and outreach efforts for the project, the Flint Hills National Wildlife Refuge has established a mailing list for persons wishing to receive information on the project in the future. Please feel free to contact the refuge or the website for additional project information.

Comment 8. *I want to go on record as a supporter of the Flint Hills Legacy Conservation Area as proposed by the U.S. Fish and Wildlife Service.*

I live less than 25 miles from the Kansas Flint Hills that is part of the North American tallgrass prairie and own 3200 acres near Maple Hill, Kansas. I can attest to the beauty of the area and the dire need to conserve the last 4% of this endangered original ecosystem that is now and should remain in private hands.

Past experience has proven that conservation easements are one of the most efficient and cost effective methods of preserving the tallgrass prairie for future generations of Americans. Conservation easements in the Flint Hills are funded by several organizations including Kansas Department of Wildlife and Parks, Ranchland Trust of Kansas, The Nature Conservancy, Kansas Land Trust, and

the USDA [U.S. Department of Agriculture]. To preserve the tallgrass habitat on a large landscape scale, the above listed organizations need the assistance of the USFWS [U.S. Fish and Wildlife Service].

If the USFWS's goal of 1.1 million acres of conservation easements can be met in conjunction with private landowners and land trusts, the Flint Hills tallgrass ecosystem will be ensured protection and can remain largely unfragmented.

Response 8. Thank you for your comments.

Wind Energy and Oil and Gas Development

Comment 9. *I do understand there are no wind farms allowed in a broad context, but the second paragraph on page 28 [of the draft EA] where it reads, "The proposed action would affect location and distribution, but not rate or density, of wind energy infrastructure development." I don't understand what that sentence means, the "rate or density" part.*

Response 9. The language has been changed to clarify it.

Funding

Comment 10. *I just learned of your Flint Hills Legacy Conservation Area. This is going to cost money to set up and manage. Is there a Friends group set up so the public can provide support directly to this FWS initiative?*

Response 10. Currently there is not an established Friends group, but one may be established in the future. The Land and Water Conservation Fund (LWCF) will be the primary funding source for this project. Currently, LWCF money is derived primarily from offshore oil development in the Gulf of Mexico.

Comment 11. *Am I correct in understanding that the only planned federal money would be Land and Water Conservation Funds; if other money is involved, it would come from various non-federal groups or individuals? If the Land and Water Conservation Fund is not the only source of funding, what other sources are being considered/have been selected?*

Response 11. The main source of funding for the Flint Hills Legacy Conservation Area project would be Land and Water Conservation Funds, which are derived primarily from oil and gas leases on the outer continental shelf, motorboat fuel tax revenues, and sale of surplus federal property. However, as with other conservation projects, it is possible that non-profit organizations or individuals may wish to donate easements, or that some funds may be appropriated by Congress at some point. The Service hopes to work with a variety of conservation organizations and agencies that already have successful projects underway, and would take into consideration any opportunities to work with these groups.

The other traditional source of funding for conservation projects, the Migratory Bird Conservation Fund (duck stamp) would not be available for the Flint Hills Legacy Conservation Area. There is a possibility that grants or other funding opportunities may present themselves down the road.

Small Holdings vs. Large Holdings

Comment 12. *We were unable to attend the second round of community forums regarding the Flint Hills initiative, so [we] want to take this means to express our approval of the initiative and its form as we understand it. Particularly for its exclusion of industrial wind turbines, oil and gas exploration, and subdivision development, because allowing such would defeat the purpose of protecting this unique remnant of a (what is now an even more) vital ecosystem.*

At the same time we hope you will not rigidly follow the numbers that say large holdings are cheaper per acre to acquire than small ones, for three reasons:

- *Including some small holdings should increase general public interest in and support of the initiative;*
- *Some small holdings could have strategic locations; and*
- *Some small holdings could be useful adjuncts to larger ones.*

We thank you for all the time, thought, and work that has been given.

Response 12. Using ranking criteria, the Service will acquire the most intact, highest quality habitat available from willing sellers. The Fish and Wildlife Service will work to obtain the highest quality tallgrass prairie habitat available for purchase with the available funding. A variety of property sizes will likely need to be acquired in order to provide the up to 10,000-acre total patch size the Service seeks to provide. Properly managed grassland will have a mosaic of prairie vegetation and minimal tree encroachment.

Expansion of Flint Hills Legacy Conservation Area

Comment 13. *The North American tallgrass prairie is one of our most endangered ecosystems. Less than 4% of the original ecosystem remains and most of it is located in the Kansas Flint Hills. I do wish that in the future, the U.S. Fish and Wildlife Service will*

include the southern Flint Hills which go down into Oklahoma. I don't feel that it should have been left out because it is in a different district office.

Conservation easements are cost effective methods of preserving the tallgrass prairie for future generations of Americans. Many organizations fund conservation easements in the Flint Hills; however, these organizations need the assistance of the USFWS if the tallgrass habitat is to be preserved on a large landscape scale.

The U.S. Fish and Wildlife's goal of 1.1 million acres of conservation easements will, in conjunction with private landowners and land trusts, ensure that the Flint Hills tallgrass ecosystem remains largely unfragmented.

I fully support the creation of the Flint Hills Legacy Conservation Area and am eager to help the United States Fish and Wildlife Service make the plan a reality.

Response 13. Several comments were received from the public on the possibility of the addition of a conservation program for the tallgrass prairie habitat located in the state of Oklahoma. Region 2 of the Service will take into consideration the possibility of future tallgrass conservation efforts in Oklahoma.

Thank you for your comments.

Multiple Comments

Comment 14.1. *I am very pleased with landscape-scale protection of the Flint Hills!*

Comment 14.2. *I am very pleased with the preservation of ranching culture.*

Response 14.1–14.2. A landscape-scale approach with the ranching culture's use of appropriate grazing and fire regime is essential to the conservation of the tallgrass prairie and its grassland-dependent wildlife.

Comment 14.3. *I am very pleased with prohibition of industrial-scale wind energy, and oil and gas development.*

Response 14.3. The Fish and Wildlife Service fully supports the Department of the Interior alternative energy development initiatives. However, the incorrect siting of energy development infrastructure could have serious impacts on grassland birds.

Comment 14.4. *Well done!*

Response 14.4. Thank you for your comment.

Comment 15.1 *I support the assessment and plan as developed and presented. The Flint Hills are truly deserving [of] protection and conservation easements are the logical approach to provide this protection. This is a great use of Land and Water Conservation Funds.*

Response 15.1. Thank you for your comments.

Comment 15.2. *I hope through time you will expand the acreage beyond the initial 1+ million acres.*

Comment 15.3. *I also hope you will target land along the interstate to protect that corridor. That land is under a lot of pressure for development (Topeka to Kansas).*

Response 15.2–15.3. The Flint Hills landscape is worthy of protecting with conservation easements using LWCF. The Service will carefully consider the location of areas of acquisition to address development pressure and to assess the need for expansion of potential conservation efforts in the future.

Comment 16.1. *I would like to see the tallgrass prairie not go to houses and development. I would also like to preserve the prairie.*

Response 16.1. Thank you for your comments.

Comment 16.2. *Forever is a long time. I think generational easements may let each generation…*

Response 16.2. Perpetual conservation easements are utilized instead of short-term contracts to provide long-term protection of the habitat and wildlife resources.

Comment 16.3. *Is water considered a mineral right?*

Response 16.3 Water rights are not being pursued as a part of this project, but would be considered separately from any mineral resources in a Service easement.

Comment 16.4. *Your figure 2 map needs to add easements from the Grassland Reserve program.*

Response 16.4. The project area map includes only conservation areas under a permanent form of protection.

Comment 16.5. *I think people would be more willing to do easements by parcels, maybe by farm and tract, like FSA [Farm Service Agency] and NRCS [Natural Resources Conservation Service].*

Response 16.5. The easement program will allow some flexibility for landowners on what portions of their land is covered in the easement.

Comment 17.0. *First, let me say that I am very impressed by the amount of research and effort put into your study, the history of the area, ecology, and culture of the Flint Hills. I know your time was limited, but feel you did a thorough job and covered*

all aspects well. The aspects of the plan I am most pleased about include:

Comment 17.1. *The actual area targeted is correctly identified as the Flint Hills in Kansas.*

Comment 17.2. *The priority areas targeted are well identified and should help in choosing easements.*

Response 17.0–17.2. Thank you for your comments.

Comment 17.3. *The projection that without additional conservation easements the Flint Hills will be increasingly fragmented, encroached by trees, residential units, industrial and commercial development, is correct. The tallgrass prairie would be lost. In particular, it is essential to prevent future industrial wind complexes from fragmenting the prairie. In addition, future residential or "ranchette" development could soon turn Flint Hills into brush country as has been seen in the Texas Hill Country.*

Response 17.3. The Service agrees that Flint Hill's tallgrass prairie habitat is likely to be increasingly fragmented by trees and development if current trends continue without an overall, landscape-scale conservation effort.

Comment 17.4. *The projection that these conservation easements will help protect the culture and ranching heritage, which in turn will help protect and manage the tallgrass prairie is also correct.*

Response 17.4. The fire-climax tallgrass prairie ecosystem and grassland-dependent wildlife require an appropriate fire and grazing regime for long-term sustainability. The ranching culture provides these essential management practices.

Comment 17.5. *The proposal that any land under the conservation easement agreement must not increase the amount of tree or brush coverage, and the landowner will be encouraged to decrease the amount of woody invasion is a very good one.*

Comment 17.6. *The proposal that landowners with easements will be assisted with advice and information in noxious weed control and best management practices is good.*

Response 17.5–17.6. Control of woody plants and other invasive plants is vital to maintaining healthy prairie habitat. The programs and assistance offered by Partners for Fish and Wildlife (PFW), and the NRCS have been very important to these control efforts.

Comment 17.7. *The proposal that all easements must be from willing sellers and no fee-title land acquisitions will be made is essential.*

Comment 17.8. *The fact that public access remains in the hands of the landowners is essential.*

Response 17.7–17.8. The Service only obtains conservation easements from willing sellers. It is clear from input by landowners and the public that the acquisition program in the Flint Hills would need to be through a conservation easement program, and not by fee-title. Service easement acquisitions are with willing sellers only, and allow the landowner to retain control of public access.

Comment 17.9. *The mosaic pattern of 10,000-acre parcels separated by a maximum distance of 20 miles concerns me. The 10,000-acre parcels may be fine, but a distance between them of 20 miles is too far. That allows for an entire wind complex in that space, or much commercial or residential development. I would rather see a tighter network of easements, even if it includes smaller parcels, either contiguous or at 5 or 10 miles apart.*

Response 17.9. Placement of easements will be determined by the biological needs of the trust resources of the Flint Hills—grassland birds. As more scientific information becomes available over time, the prioritization strategy will be refined to incorporate new information.

Comment 17.10. *Ranchers must be certain that future policy changes by the USFWS or the Department of the Interior do not rescind any of the land use rights that are provided in these easements. The government has a habit of putting different people in charge of established programs and changing the game rules. It must not happen that some future politician can come along and decide the Flint Hills should be an ungrazed public park.*

Response 17.10. Service conservation easements are legal, binding contracts for both the landowner and the Service. The terms defined in the easement document will remain constant despite changes in refuge personnel.

Comment 17.11. *Access to water and all existing water rights is essential and should be included in the wording of the easements.*

Response 17.11. Flint Hills Legacy Conservation Area (FHLCA) conservation easement terms do not limit access to water, or address water rights usage.

Comment 17.12. *Historically proven and generally accepted ranching practices including fire, must be acceptable and that wording should be included in the easements.*

Response 17.12. The appropriate use of prescribed fire is essential for maintaining healthy tallgrass prairie. Easement language will not dictate fire practices by the landowner, but will state that the end-state/purpose of the easement is for providing intact tallgrass prairie.

Comment 17.13. *Equal considerations should be given for large or small tracts of land. Reasoning: the*

smaller ranchers need the lease fee as much or more than the larger ranches, otherwise smaller ranchers might be more easily enticed to sell to developers or residential buyers creating a patchwork of fragmentation.

Response 17.13. The Service recognizes that to obtain approximately 10,000-acre blocks of high quality habitat, consideration will need to be given to a variety of ranch sizes.

Comment 17.14. *Since preserving the large landscape habitat and ecology of the prairie is the goal of these easements, splits and carve-outs should be kept at a minimum, although the size of the property under easement should be considered. My recommendation would be that on acreage of one section or less (640 acres), there should only be one 5-acre carve-out allowed and one agricultural split with possibly one additional future family residence, not to be in the center of the easement.*

Comment 17.15. *Larger contiguous easements two sections or less (1280 acres) that do not already have established home sites on them, should be allowed the same; one 5-acre carve-out, one agricultural split, and one possible future family residence, preferably in the existing carve-out and not to be in the center of the easement.*

Comment 17.16. *Easements of over two contiguous sections could be allowed one more agricultural split, but I would not recommend any more residences.*

Comment 17.17. *Easements that are not contiguous acreage could be allowed agricultural splits of the separate parcels (but the parcels themselves should not be split), which would allow for neighbors or family members to purchase them, but I would not allow any more residences. A possible exception could be made if a parcel already had an old existing home site or a former home site on it.*

Response 17.14–17.17. Careful consideration will be given to the number of splits (agricultural or residential carve-outs) from the footprint covered by the easements. It will be essential for the landowner and Service staff to discuss future needs and plans for any parcel being considered for an easement. Local zoning requirements will also determine the minimum size of parcels.

Comment 17.18. *Easements should allow for access to streambed gravel for ranching roads or ranching purposes only.*

Comment 17.19. *Easements should allow for reshaping and general erosion management of creek crossings regularly used for vehicles, livestock, or fences.*

Response 17.18–17.19. Easements terms will allow for traditional (non-commercial) ranching practices such as use of streambed gravel on the landowner's roads, and for general erosion control management.

Comment 17.20. *Easements should allow for erosion control in creeks and watersheds; for example streambed erosion control as approved by NRCS.*

Response 17.20. Service conservation easement areas will be available for NRCS funding and assistance.

Comment 17.21. *Initial applications will be slow in coming due to general distrust of the government. But if you present a stable, open, and honest up-front program, you will get applications. Once a few easements have been accepted and [are] in place, area landowners will closely watch the results. Good results will yield many more easements.*

I hope these suggestions will assist you in your final planning. We certainly hope you are successful in your proposal for the Flint Hills Legacy Conservation Area. It would lend a great amount of stability to the ranching community and the tallgrass prairie.

Response 17.21. We have implemented similar conservation easement projects in other areas. The Service looks forward to working with landowners in the Flint Hills to develop a successful program.

Thank you for your comments.

Comment 18.1. *I am pleased that no commercial wind projects would be allowed in the proposed easements. Also it appears there is some flexibility on the lease agreement language regarding splits.*

Response 18.1. The biological needs of grassland bird species dependent on prairie preclude wind (or other tall vertical structures) on conservation easement lands.

See also the response to comment 17.14–17.17.

Comment 18.2. *[The environmental assessment] needs to address watershed issues, especially the federal-funded watersheds.*

Response 18.2. See the response to 17.11 and 17.20.

Comment 18.3. *On page 28, second paragraph, first sentence [of the draft EA] reads, "the proposed action would affect location and distribution, but not rate or density, of wind energy infrastructure development."*

Response 18.3. The language has been changed to clarify it in the final EA (see page 28).

Comment 18.4. *Good meeting you have hosted. Keep up the good work.*

Response 18.4. Thank you for your comments.

Comment 19.1. *I am generally supportive of the idea of using conservation easements to preserve wildlife in the Flint Hills. However, I have some concern about how the U.S. Fish and Wildlife Service plans to implement this program.*

After reading the proposed Flint Hills Legacy Conservation Area (FHLCA) material (September 2009) and attending scoping meetings held last fall, several issues come to mind. They can be sorted into three categories: ecological, economic, and cultural.

Although the material mentions flora and fauna that may benefit from said easements, no metrics are mentioned that would actually substantiate this claim over time.

Response 19.1. The benefits to flora and fauna are substantiated by research that points out that the native species are negatively impacted by habitat fragmentation in a number of ways that this project hopes to prevent (Kuvlesky et al. 2007, McDonald et al. 2009, Giesen 1994, Fuhlendorf et al. 2002, Robel 2002). See specific information on ecological impacts and responses of fragmentation pages 23–26 of the final EA.

There are a variety of levels of tallgrass prairie habitat quality throughout the Flint Hills. Using ranking criteria for evaluation, the Service will acquire the highest quality, most intact tallgrass habitat available from willing sellers with the funds that are available.

Comment 19.2. *Further, there appears to be no level of accountability regarding range health asked of landowners who participate in the program. Preserving the "status quo" is an inadequate result for such an extensive venture.*

Response 19.2. It is generally accepted that reducing or eliminating habitat fragmentation is the first step toward protecting the Flint Hills habitat. If the conditions of the easement are so restrictive to landowners that they are unwilling to participate, then there is no chance for project success. The Service had discussions with landowners during the scoping process about requirements to maintain tree encroachment at or below the current level and to restrict herbicide application to spot treatments.

Comment 19.3. *The effects of annual and excessive range burning in the Flint Hills have come into question. There was even a time (1950s) when the practice was discouraged.*

Response 19.3. We recognize that while grazing and prescribed burning practices are essential to maintaining tallgrass prairie in the Flint Hills, they can also degrade habitat when not used properly. The fire-climax tallgrass prairie ecosystem and grassland-dependent wildlife require appropriate fire and grazing regimes for long-term sustainability. The ranching culture provides these essential management practices.

The PFW program and other conservation programs have been working with Flint Hills ranchers to alter management practices in ways that benefit habitat but do not significantly decrease ranch profitability.

Also, see the response to comment 19.2.

Comment 19.4. *Preserving "ranching lifestyles and economies" may be in direct contradiction to the stated "preserve and protect' mission of the USFWS.*

Response 19.4. See the response to comment 19.2.

Comment 19.5. *More specifically, there appears to be a direct correlation between Early Intensive Stocking, which began in the 1980s, and the decline of the greater prairie-chicken.*

Response 19.5. See the response to comment 19.3.

Comment 19.6. *The easements prohibit residential and commercial development, but do not prohibit further extraction of petroleum resources as they are grandfathered as a "traditional" use. This too, flies in the face of the stated purpose of the FHLCA which is "to help maintain the integrity of … stream water quality."*

Response 19.6. The Service has no authority to prevent mineral extraction from property where the mineral rights have already been sold (severed estate) (USFWS Manual 612 FW2). If the mineral rights are not severed, the easement that the Service acquires will require any mineral extraction (or other energy development) to occur off-site to prevent habitat fragmentation.

Comment 19.7. *If an easement permanently severs and removes distinct economic values from the landscape, it is short sighted to allow that event to benefit the initial generation only.*

Response 19.7. The easements will be obtained from willing sellers only. Maintaining healthy tallgrass prairie and its aesthetic values for future generations can provide economic benefits for wildlife recreationists and for agri-tourism in the region. Conserving tallgrass prairie may even increase land values on adjacent properties. The easement program would to a large extent maintain the existing conditions for landowners and the general public, and will not significantly affect the quality of the human environment, and will not have a close causal connection to a change in the physical environment (40 CFR 1508.27).

Comment 19.8. *An easement that is perpetual should pay in perpetuity. The same money currently designated to make one-time payments for easements could be pooled, invested wisely, and made to*

produce an enduring stream of income for current and future landowners.

Response 19.8. This comment is received and considered, however, the Service's normal practice is to make a one-time payment. How that income is managed or invested will be left to the individual landowner.

Comment 19.9. *Stripping off development rights in one generation will depress the value of land carrying an easement and therefore the easement will negatively affect local tax rolls.*

Comment 19.10. *However, land that has kept this value intact through a pre-established flow of easement funds (as suggested in item #4 [comment 19.8]) will have an elevated value just as land sold with an ongoing mineral royalty is more highly valued.*

Response 19.9–19.10. Tax valuation is based on the agricultural value of the land, which would not be impacted by an easement. Land values can actually increase if there are protected viewsheds and lands adjacent to a property.

Comment 19.11. *If there are measurable improvements in the flora and fauna due to the implementation of an easement, an enhanced recreational value will emerge. Many "traditional" ranches in Texas now garner more return from hunting and fishing than from cattle (the "historic" use). FHLCA easements now being considered would make it more difficult, if not impossible, for a landowner to develop any additional infrastructure to capture the economic benefit of an enriched landscape.*

Response 19.11. Landowners may have some limited options for carving out portions of their property from the easement, thereby allowing other uses or future structures/building construction. The easement will only limit the construction of additional structures in areas that are not located in carve-out portions of the property. The landowners will retain access control, including public recreational activities.

Comment 19.12. *FHLCA easements will disallow all local and regional power of eminent domain regarding electrical transmission lines. Only the federal Department of Energy would have the authority to require a transmission easement across affected property.*

Comment 19.13. *Essentially, the FHLCA easements could present a significant barrier between the rich wind energy resource in western Kansas and load centers in the eastern U.S. eager for renewable power.*

Response 19.12–19.13. Of the 3.3 million acre acquisition boundary we would have authority to purchase easements on one third of that area, leaving the remainder as avenues for any necessary energy transmission routes. Currently there are already a number of transmission lines in place throughout the Flint Hills region and Kansas. (A map is available at http://kec.kansas.gov/chart_book/Chapter6/02_KSWindEnergyElectricTransMap.pdf)

Also, Service easements would not affect areas with a utility right-of-way already in place.

Comment 19.14. *The greatest impediment to broad-scale cultural acceptance of these easements will be the perpetual nature of them: people are generally uncomfortable about compromising an asset's value in the face of the uncertain needs of the future. USFWS may wish to allow an "opt-out" window every 25 years.*

Comment 19.15. *It is unlikely that a landowner will opt-out of the easement for the following reasons.*

- *Having received a steady cash flow (item #4 [comment 19.8]) for 25 years, landowners would be unlikely to relinquish that income.*
- *Penalties for opting out should be severe; for example, four times the amount received over the past 25 years.*

Response 19.14–19.15. This comment is taken under advisement. The current easement acquisition strategy permanently prevents habitat destruction resulting from residential and commercial development activities. The easements will be acquired from willing sellers only.

Comment 19.16. *USFWS may find its objectives better served by a long-term contract as implemented in the USDA's Conservation Reserve Program that has been well accepted by the agricultural community.*

Response 19.16. In addition to the option of shorter-term programs such as the USDA program, there is now interest in a Flint Hills conservation program that can provide perpetual preservation of tallgrass prairie.

Perpetual conservation easements are preferred by the Service instead of short-term contracts in order to provide long-term protection of the habitat and wildlife resources.

Comment 20.1 *The draft environmental assessment of the proposed Flint Hills Legacy Conservation Area says that the project "would be monitored as part of the Refuge System in accordance with the National Wildlife Refuge System Administration Act of 1966." Does that meant that NWRSAA [National Wildlife Refuge System Administration Act of 1966] regulations would apply, just as if this were in fact a refuge?*

Response 20.1 If approved, the Flint Hills Legacy Conservation Area will be established as a unit of the National Wildlife Refuge System (NWRS). The National Wildlife Refuge System is the largest network of lands in the world dedicated to the protection of wildlife and its habitats. The NWRS has now been in existence more than one hundred years and there are numerous designations, legal authorities, etc., that have been used to create what we have today. You will notice we have national wildlife refuges, waterfowl production areas, conservation areas, wetland management districts, etc. The NWRS also has a wide variety of interests in lands—ranging from unique deed relationships with states, for example, the Rockefeller Refuge in coastal Louisiana—to management responsibilities associated with New Deal programs. The Flint Hills Legacy Conservation Area will be managed as a unit of the National Wildlife Refuge System consistent with the mission of the NWRS.

Although FHLCA would be managed as a unit of the National Wildlife Refuge System, conservation easement refuges differ from traditional national wildlife refuges in that the landowner retains ownership, control of public access and land management practices, and no additional fencing or posting of signage is required by the NWRS.

In this EA, the Service has determined that conservation easements are the appropriate manner to enhance population goals where fragmentation and degradation of habitat is a limiting factor on declining species. The Service has a long history of success using conservation easements to support the biological needs of such species. Strategic habitat conservation is essential across such large landscapes and we hope the document allows readers to understand that it is possible to best achieve the conservation protections we desire by working with landowners in the Flint Hills to develop a long-term (multi-generational) approach to preserve a very important piece of the American landscape.

Comment 20.2. *The draft EA says what the Refuge System's mission is, but doesn't appear to articulate the proposed [Flint Hills Legacy] Conservation Area's mission. It does state the area's purpose. Is the mission the same as the purpose? If there is a separate mission statement, can you send that to me? If it has not yet been drafted, what is the time frame for creating it and who will draw it up?*

Response 20.2. There is not a mission statement for each land designation. Specifically you ask if there is a mission for conservation areas. No, all units of the National Wildlife Refuge System mission will be managed in accordance with existing laws and regulations and under the mission statements of the Service and the National Wildlife Refuge System.

Comment 20.3. *Has it been determined where the funding will come from? If the Land and Water Conservation Fund is not the only source of funding, what other sources are being considered/have been selected.*

Response 20.3. The main source of funding for the Flint Hills Legacy Conservation Area will be Land and Water Conservation Funds, which are derived primarily from oil and gas leases on the outer continental shelf, motorboat fuel tax revenues, and sale of surplus federal property. However, as with other conservation projects, it is possible that non-profit organizations, or individuals may wish to donate easements, or that some funds may be appropriated by Congress at some point. The Service hopes to work with a variety of conservation organizations and agencies that already have successful projects underway, and would take into consideration any opportunities to work with these groups.

Comment 21.1. *I agree with the terms of these easements as outlined in the draft.*

Response 21.1. Thank you for your comments.

Comment 21.2. *Prioritization for large blocks of intact property in the heart of the Flint Hills is important in that it will provide for ample habitat for tallgrass prairie wildlife such as the "key" lesser prairie-chicken species.*

Response 21.2. Conservation of large blocks of intact tallgrass prairie will be essential to providing habitat for grassland-dependent birds and maintaining a migration corridor.

Comment 21.3. *I was pleased to hear that the plan will preclude wind energy development. Turbines and towers have no place in a natural ecosystem conservation project such as this one.*

Response 21.3. Preliminary studies indicate tall vertical structures fragment large tracts of otherwise appropriate habitat, making it unsuitable for some grassland bird species.

Comment 21.4. *On the same note, your approach to existing oil and gas operations and mineral royalty rights seems practical in that non-mineral owners with existing operations will be managed to minimize impact, while owned minerals will be valued and paid for to preclude development.*

Comment 21.5. *Maybe the same approach being used with oil and gas could be used concerning power lines and other easements that might exist.*

Response 21.4–21.5. On properties where wind, oil and gas, or mineral rights have already been sold (severed from the estate), the Service will work with landowners and developers to minimize any negative impacts of development and extraction activities (50 CFR 25.11). On land where the rights for wind, oil

and gas, or mineral development have not been sold (estate is still intact), conservation easements would require non-surface occupancy (off-site development) for any future development activities. The Service would consider development of energy and mineral resources on the easement properties, if they can be implemented without disturbing the surface or creating vertical barriers, which would fragment the grassland habitat for wildlife.

Comment 21.6. *Concerning management practices, I strongly believe that three things must exist to sustain a tallgrass prairie: fire, grazing, and substantial spring precipitation. Therefore, I was happy to hear that restrictions on burning are not anticipated. Fire is important to prairie habitat and as smaller acreage properties encroach upon the Flint Hills prairie there seems to be an undertone of detractors to the use of fire.*

Response 21.6. The fire-climax tallgrass prairie ecosystem and grassland-dependent wildlife require an appropriate fire and grazing regime for long-term sustainability. The ranching culture provides these essential management practices.

Comment 21.7. *Additionally, there are recent claims that prairie fire has some correlation with the reduction in prairie-chicken numbers. I would be careful in concluding that this issue is a result of fire. Fire has occurred on this specific prairie for hundreds of years, and the Flint Hills remain as the last 2% of the tallgrass prairie that once stretched from Canada to Mexico.*

Response 21.7. We recognize that while grazing and burning practices are essential to maintaining tallgrass prairie in the Flint Hills, they can also degrade habitat when not used properly. The PFW program and other conservation programs have been working with Flint Hills ranchers to alter management practices in ways that benefit habitat but do not significantly decrease ranch profitability.

Comment 21.8. *Reasons why the Flint Hills and the prairie chickens have remained include continued use of fire, grazing, and un-interruption of large blocks of prairie lands. Areas that were once tallgrass prairie and have discontinued using grazing and fire have lost prairie-chickens and prairie to woody plant species. Prairie-chickens need prairie and and healthy prairie needs fire and grazing.*

Response 21.8. The fire-climax tallgrass prairie ecosystem and grassland-dependent wildlife require an appropriate fire and grazing regime for long-term sustainability. The ranching culture provides these essential management practices.

Comment 21.9. *All in all, I believe you have generated a sound environmental assessment and land protection plan. I hope Congress appropriates sufficient funding for this project and easement purchases begin soon.*

Response 21.9. Thank you for your comments.

Comment 22.0. *I was excited to hear that the U.S. Fish and Wildlife Service was considering a conservation easement program to preserve prairie in the Flint Hills. However, after reviewing the draft document, I am disappointed to see the apparent exclusion of required range management practices in the easements; specifically, the lack of prohibition of annual burning and early intensive stocking as currently practiced by most Flint Hills landowners. I would, therefore, like to submit the following comments:*

Comment 22.1. *The fact that only two alternatives (no action and the proposed action) were considered is in my experience quite unusual. Obviously, an alternative requiring best range management practices should have been included. In fact, it is not even mentioned in the alternatives considered but not studied (draft EA, page 10).*

Response 22.0–22.1. Typically, Conservation Area land protection plans (LPPs) typically involve two alternatives, a no action (non-acquisition alternative), or an acquisition option that will establish a new unit of the National Wildlife Refuge System.

The text of the draft EA has been revised to reflect the additional alternatives that were considered but not studied further, such as fee-title acquisition, or options considering smaller and larger project boundaries (see page 10 of the final EA).

Specifically, Service-defined range management and prescribed fire management practices would have to be implemented on lands owned in fee-title by the Service, such as Quivira National Wildlife Refuge. Conservation Areas, such as the Flint Hills Legacy Conservation Area, are easement refuges with minimal interest (typically just non-development rights) acquired. Although the Flint Hills Legacy Conservation Area will be considered a part of the National Wildlife Refuge System, the land will still remain in private ownership and as such cannot be held to the same requirements and limitations placed upon a refuge owned in fee-title.

Comment 22.2. *As cited in the draft environmental assessment, the prairie ecosystem developed under burns estimated to have occurred at 3–5 year intervals and in a patch pattern, resulting in the mosaic of habitats the plan claims to want to achieve. In fact, FWS uses patch, or rotational burning on its own properties (for example Quivira National Refuge) and specifies land management practices on easements it holds in other areas. Why then would FWS not require use of such management practices on the easements it is seeking under this program?*

FWS personnel stated at both meetings I attended that management practices are subject to change and therefore cannot be included in a perpetual easement. In face of the fire history record (as cited), best management practices should be required and be modeled after those conditions under which the ecosystem developed.

Response 22.2. The fire-climax tallgrass prairie ecosystem and grassland-dependent wildlife require an appropriate fire and grazing regime for long-term sustainability. The ranching culture provides these essential management practices.

Comment 22.3. *FWS must certainly be aware that Kansas is under mandate by the Environmental Protection Agency to develop a smoke management plan because of the impacts of the Flint Hills burns. These annual, spring burns have resulted in exceedence of Clean Air Act standards in Kansas City and Wichita, and impact air quality in areas several states away. Surely, requiring less burning each year could be part of such a smoke management plan and should be incorporated into the proposed FWS easements.*

Response 22.3. The Service considered that there would likely be little to no change in the impact to human health as a result of this project and maintains that we are not requiring landowners to change their burning practices (see the response to comment 22.1). The Service hopes to work through the PFW program to influence landowners to burn less frequently, but there is no evidence that decreasing frequency would result in decreased air quality problems—if an area is burned once every three years, it may produce three times the amount of smoke as when it is burned annually because of the increased fuel load. This may result in a no net gain across the region. Future programs such as the BlueSkyRAINS program through Kansas State propose to provide information on smoke and air quality effects from prescribed fires in the Flint Hills.

Comment 22.4. *At both meetings I attended, FWS indicated that current range management practices would be considered in selecting properties for potential easement and that burning practices would be part of that consideration. If that is so, why shouldn't that be spelled out in the draft as part of the easement acquisition process parameters (draft EA, page 8)?*

Response 22.4. There are a variety of levels of habitat quality for tallgrass prairie throughout the Flint Hills. Using ranking criteria the Service will acquire the most intact, highest quality habitat available from willing sellers. Properly managed grassland will have a mosaic of prairie vegetation and minimal tree encroachment.

The Service has determined that local landowners, with few exceptions, would be unwilling to accept an easement if it involves giving up such management practices as burning or determining their own stocking rates. In order to have control of management activities such as stocking rates and burning, we would have to own the property in fee-title. Fee-title sales of land to the federal government would not be supported by Flint Hills landowners. Additionally, fee-title would cost approximately three times the amount of a conservation easement. Annual operation and maintenance costs for the Service would also be considerable. While not specifically addressed in the final EA, the Service will include provisions in the easement for maintaining tree encroachment at no more than current status when the easement is established. The Service expects local and state requirements for noxious and invasive weed control to be observed, and plans to work with landowners through the PFW program to assist them in accomplishing weed control.

Comment 22.5. *Finally, no mention is made in the draft environmental assessment of the documented, extremely negative impact annual burning has had on wildlife habitat that FWS is supposed to be protecting. One could easily argue, that current range management practices in the Flint Hills are the single greatest cause of habitat reduction, particularly that needed for grassland birds such as the greater prairie-chicken. Such lack of control of management practices on land under jurisdiction of FWS is counter to the FWS mission.*

Response 22.5. While the Service recognizes that there are examples of land mismanagement across the 3.3 million acre project area, and that mismanagement often leads to habitat degradation, the most important contribution the Service can make is to protect the land from fragmentation.

Service policy is to acquire land only when other means, such as zoning or regulation, of achieving program conservation goals and objectives are not appropriate, available, or effective. When lands are to be acquired, the minimum interest necessary to reach management objectives is to be acquired or retained. If fee-title ownership is required, full consideration will be given to extended use reservations, exchanges, or other alternatives that will lessen impact on the owner and the community.

Also see response to comment 22.4.

Comment 22.6. *Thank you for your consideration of these comments. I hope that the agency sees fit to make appropriate changes in the final documents.*

Response 22.6. Thank you for your comments.

Comment 23.1. *It is critical that individuals with a demonstrated experience of successfully working with ranchers and landowners in the Flint Hills region be directly involved in the development and drafting of the conservation easement document*

and the ranking process/procedures for determining those properties on which USFW will purchase a conservation easement. One size does not fit all and without the direct influence of "local knowledge," I am concerned that the initial easement document and ranking process will miss the mark and make it more difficult for USFW to establish the credibility and trust needed for this project to be a long-term success.

Response 23.1. The Service will continue to involve local partners/landowners in the planning process, along with local Service personnel who have local experience or expertise working with conservation easements.

Comment 23.2. *Fragmentation and fire exclusion are the two most dangerous enemies of Flint Hills conservation. I would prefer that the USFW easement did not allow for future building envelopes. That said, in order to preserve the ranching culture of the Flint Hills (which culture, in turn, preserves the Flint Hills), it may be prudent to allow a very limited number of future building sites … if so, please mandate that such sites be located in already disturbed areas that are not capable of carrying fire and are located below the horizon line. It's important that any future building sites do not become additional physical or psychological barriers to fire and that they do not contribute to the further degradation and fragmentation of the natural viewshed. A good rule of thumb would be to locate future building envelopes only in timbered locations proximate to nineteenth century home sites.*

Response 23.2. The Service agrees that a landscape-scale approach with the ranching culture's appropriate use of a grazing and fire regime is essential to the conservation of the tallgrass prairie and its grassland-dependent wildlife.

Landowners may have some limited options for carving out portions of their property from the easement, thereby allowing other uses or future structures/building construction. The easement will only limit the construction of additional structures in areas that are not located in carve-out portions of the property. The landowners will retain access control, including public recreational activities. Carve-outs would be allowed along already fragmented areas, for example, roads and buildings, and on cropland that is not important to the overall intactness of the landscape.

Comment 23.3. *It is critical that the final plan and conservation easement explicitly prohibit any development of wind energy, oil/gas (including coal-bed methane) or any other industrial or commercial development. Properties that already have oil/gas development should not be excluded from the project, but should rank lower than a comparable property that is not encumbered by such development.*

Response 23.3. Industrial and commercial development that fragments the grasslands will not be allowed. The Service would consider development of energy and mineral resources on the easement properties, if they can be implemented without disturbing the surface or creating vertical barriers, which would fragment the grassland habitat for wildlife.

Comment 23.4. *The exception to allow stream bed gravel use should apply to all existing ranch uses—not just to the homesite. For example, a sizeable ranch may have many miles of two-track ranch roads and property owners should be allowed to continue to maintain these roads with their own gravel. Cattle pens are also a place where creek gravel is commonly used and such use should be allowed to continue.*

Response 23.4. A number of comments were received during public meetings on the maintaining landowner access to gravel resources. Stream bed gravel extraction will be allowed for ranching processes. No commercial gravel extraction activities will be allowed. Stream bed gravel extractions will be subject to all local, state, and federal laws. Individual landowners will need to determine any tax implications.

Comment 23.5. *The USFW should not require a landowner to offer all of her land holdings to be placed under easement at the same time. For practical and personal reasons, it is likely that many interested landowners may not be willing or able to sell an easement on all of their otherwise eligible land at any one time.*

Response 23.5. Conservation easements will be acquired from willing sellers. No one will be forced to offer land they do not wish to place under an easement.

Comment 24.1. *I am disappointed to know that the 30 day comment period started, apparently, when the EA was posted on the web and not when the first public meetings were held. I understand the legalities involved, but what's right isn't always what's correct.*

Response 24.1 The draft EA and LPP were provided prior to the public meetings to provide the public with an opportunity to review the documents in advance of the public meetings and to have the time to provide substantive comments on the specific information in the plans.

Comment 24.2. *I support the concept of the plan BUT I have great concerns over the EA document itself, and what that casts on the entire plan. The bird list in the appendix is a horrible mess and I think it reflects very badly on the entire document. Any biologist that really looks at this and pays attention will notice this and wonder what's up with the rest of the document. Whomever put the document together*

did not use a current American Ornithologists Union taxonomic order as a guide. At least once, a bird is listed twice and some species have the wrong scientific name associated with them. Species that are commonly found in the Flint Hills region are omitted and species that are far less common are included. In at least one case (American Dipper, Cinclus mexicanus) you have a species that isn't even documented to have ever occurred in Kansas, let alone in the Flint Hills. I started reading this list and to be right honest, I was appalled. There are lots of resources and people, myself included, available to make this list a correct list. Just give us the chance!

Response 24.2. The EA species appendix has been modified to correct the errors in the bird species list.

Comment 24.3. *I continue to be concerned by the lack of coordination with entities that could make or break this project. For this to be successful many groups need to buy in to it and support it. As this has been ran so far, it looks quickly and shoddily thrown together and driven from the top down. That doesn't fly well in this state where private property rights and local control are so highly valued. I fear that this project has started off on the wrong foot and will make it very difficult for a potentially extremely valuable program to have success.*

Thank you for taking the time to listen to my concerns. As always, I am available to help make this a positive program with countless benefits to the Flint Hills ecoregion and its residents.

Response 24.3. The Service became involved in the Flint Hills tallgrass conservation effort due in a large part to the interest expressed by a variety of organizations and agencies for an overall landscape-scale Service-led conservation effort in the region. The Service believes that ongoing coordination and communication regarding conservation of tallgrass prairie resources is essential to the success of the project. The Service will continue to work collaboratively with individuals, nongovernmental organizations, federal, state, and local agencies on a variety of issues, including renewable energy development. Also, the Service has initiated a program using Landscape Conservation Cooperatives (LCCs) as a means of addressing conservation and climate change challenges through partnership opportunities (see page 35 of the final EA).

Thank you for your comments.

Agency, Organizations, and Commercial Corporation Comments

Agency comments received include the original letter received and our responses. Comment 25 is on the following page.

Comment 25. Attachments included in the letter are as follow:

- NOAA Hazard Mapping System graphic
- Downwind Monitors with Ozone Exceedances in Smoke Plumes by Satellite Imagery table
- Unlabeled map
- USFWS Real Property Part 341, Chapter 6, Directors Orders 164 and 170
- Major Negative Impacts of Early Intensive Cattle Stocking on Tallgrass Prairies: The Case of the Greater Prairie-Chicken. North American Birds, Volume 56 (2002) Number 2 pp. 239–244
- Location and Success of Lesser Prairie-chicken Nests in Relation to Vegetation and Human Disturbance. Journal of Wildlife Management 69: 1259–1269; 2005
- Sample Grassland Easement (Region 6)
- Sample Habitat Easement (Form 1)
- Sample Habitat Easement (Form 2)
- Sample Habitat Easement (Form 4)
- Article by Jan Stiles, Birds declining in the Flint Hills
- Article by Jan Stiles, Prairie chicken habitat being lost

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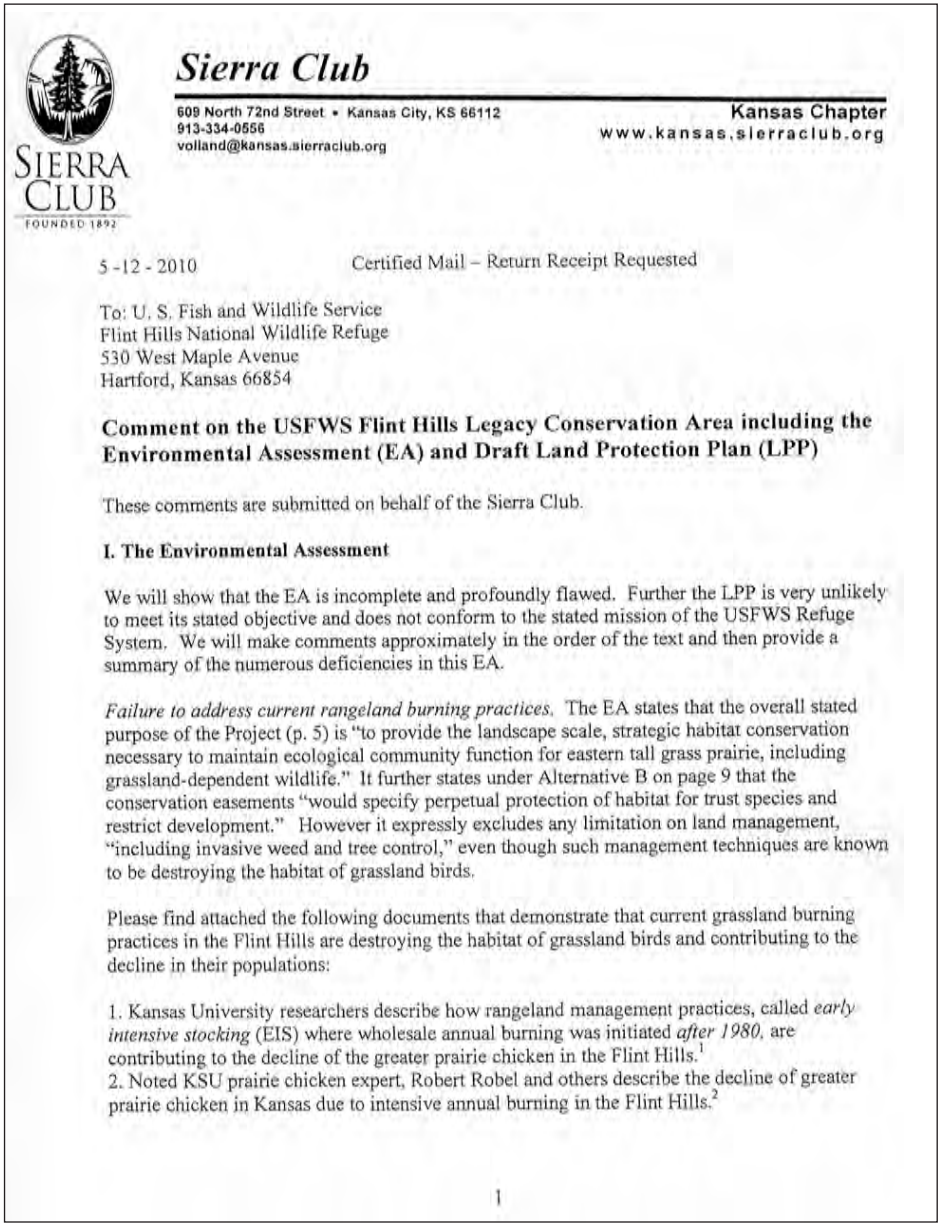
25.1		**Response 25.** Thank you for your interest in the FHLCA project. The U.S. Fish and Wildlife Service would like to take this opportunity to address some concerns and misinformation and/or misconceptions that the Sierra Club perceives as part of the FHLCA project. **Response 25.1.** While the Service recognizes that there are examples of land mismanagement across the 3.3 million acre project area, and that the mismanagement often leads to habitat degradation, the most important contribution the Service can make is to protect the land from fragmentation. In addition to the importance of proper grazing practices, one of the management implications suggested in the Journal of Wildlife Management article submitted with the Sierra Club comments is the protection of lesser prairie-chicken habitat from development, and acquisition of lands without anthropogenic features present. A number of other authors have addressed the fragmentation effects of infrastructure on prairie grouse (Kuvlesky et al. 2007, McDonald et al. 2009, Giesen 1994, Fuhlendorf et al. 2002, Robel 2002). Service policy is to acquire land only when other means, such as zoning or regulation, of achieving program conservation goals and objectives are not appropriate, available, or effective. When lands are to be acquired, the minimum interest necessary to reach management objectives is to be acquired or retained. If fee-title ownership is required, full consideration will be given to extended use reservations, exchanges, or other alternatives that will lessen impact on the owner and the community. The Service has determined that local landowners, with few exceptions, would be unwilling to accept an easement if it involves giving up such management practices as burning or determining their own stocking rates. In order to have control of management activities such as stocking rates and burning, we would have to own the property in fee-title. Fee-title sales of land to the federal government would not be supported by Flint Hills landowners. Additionally, fee-title would cost approximately three times the amount of a conservation easement. Annual operation and maintenance costs for the Service would also be considerable. While not specifically addressed in the draft EA, the Service will include provisions in the easement for maintaining tree encroachment at no more than current status when the easement is established. The Service expects local and state requirements for noxious and invasive weed control to be observed, and plans to work with landowners through the PFW program to assist them in accomplishing weed control.

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5 -12 - 2010 Certified Mail – Return Receipt Requested

To: U. S. Fish and Wildlife Service
Flint Hills National Wildlife Refuge
530 West Maple Avenue
Hartford, Kansas 66854

Comment on the USFWS Flint Hills Legacy Conservation Area including the Environmental Assessment (EA) and Draft Land Protection Plan (LPP)

These comments are submitted on behalf of the Sierra Club.

I. The Environmental Assessment

We will show that the EA is incomplete and profoundly flawed. Further the LPP is very unlikely to meet its stated objective and does not conform to the stated mission of the USFWS Refuge System. We will make comments approximately in the order of the text and then provide a summary of the numerous deficiencies in this EA.

Failure to address current rangeland burning practices. The EA states that the overall stated purpose of the Project (p. 5) is "to provide the landscape scale, strategic habitat conservation necessary to maintain ecological community function for eastern tall grass prairie, including grassland-dependent wildlife." It further states under Alternative B on page 9 that the conservation easements "would specify perpetual protection of habitat for trust species and restrict development." However it expressly excludes any limitation on land management, "including invasive weed and tree control," even though such management techniques are known to be destroying the habitat of grassland birds.

Please find attached the following documents that demonstrate that current grassland burning practices in the Flint Hills are destroying the habitat of grassland birds and contributing to the decline in their populations:

1. Kansas University researchers describe how rangeland management practices, called *early intensive stocking* (EIS) where wholesale annual burning was initiated *after 1980,* are contributing to the decline of the greater prairie chicken in the Flint Hills.[1]
2. Noted KSU prairie chicken expert, Robert Robel and others describe the decline of greater prairie chicken in Kansas due to intensive annual burning in the Flint Hills.[2]

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25.2	3. Dr. Robel explains why intensive annual burning in the Flint Hills inhibits breeding of the greater prairie chicken.[3] 4. Researchers from Kansas State University and Oak Ridge National Laboratory describe how three bird species are experiencing severe population declines due to current land management practices in the Flint Hills. Dr. Kimberly With recommends patch burning as a solution.[4] Since this is such an obvious omission Sierra Club representatives who attended the scoping meetings and the open house meetings to discuss the draft EA asked why excessive burning had not been addressed. USFWS personnel responded that they could not address, in a perpetual easement, rangeland management practices, that may change over time. That argument is directly contradicted by sample easements that we obtained from USFWS Service Manual, Chapter 341. See attached manual text and associated sample easements. The Sample Grassland Easement used in Region 6, which includes Kansas, is a *perpetual* easement which clearly limits ranchland management practices. The Sample Habitat Easement used in Region 3, which could cover prairie chicken habitat in Missouri and Iowa, also clearly limits ranchland management practices and specifically mentions burning.[5] On page 8 under Habitat Protection and Easement Acquisition Process, USFWS says, "The basic considerations in acquiring an easement interest in private land are *the biological significance of the area, the biological requirements of wildlife species of management concern, existing and anticipated threats to wildlife resources* (emphasis ours), and landowner interest in the program." Yet, by ignoring destructive burning practices, the type of easement proposed under the subject program utterly fails to conform to the bulk of the considerations claimed. There is no reason why USFWS could not specifically list patch or rotational burning as a basic consideration in acquiring easements under the subject program. It is a serious conceptual error to take the position that any modification of existing range burning practices must maintain the existing level of ranchers' profits. Both the loss of wildlife habitat and the air pollution affecting the health of downwind human communities are classic cost externalities. That's when the ranchers are able to throw off a portion of their production costs onto the public health and environment, so they can achieve a desired price for their cattle at the gates of the cattle feedlot. The American public has every right to expect that ranchers responsible for negative impacts should forgo those practices in return for the substantial payments proposed by USFWS. Further the USEPA has recognized the public health threat from the annual spring burns, and USFWS should not facilitate the very practices that concern other federal agencies. *Failure to conform to USFWS mission.* The EA states on page 7 that the Flint Hills Legacy Conservation Area will be monitored as part of the National Wildlife Refuge System. Executive Order 12996 of March 25, 1996 states that the mission of the National Wildlife Refuge System is to "preserve a national network of lands and waters for the conservation and management of fish, wildlife, and plant resources of the United States for the benefit of present and future generations." Then under Section 2, Guiding Principles concerning Habitat, it states that "Fish and wildlife will not prosper without high-quality habitat, and without fish and wildlife, traditional uses of refuges cannot be sustained. The Refuge System will continue to conserve 2	**Response 25.2.** The mission of the U.S. Fish and Wildlife Service is working with others to conserve, protect, and enhance fish, wildlife, plants, and their habitats for the continuing benefit of the American people. The mission of the National Wildlife Refuge System is to preserve a national network of lands and waters for the conservation, management, and, where appropriate, restoration of fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans. Although the FHLCA will be considered a unit of the National Wildlife Refuge System, the land will still remain in private ownership and as such cannot be held to the same requirements and limitations placed upon a refuge owned in fee-title. There are a variety of levels of habitat quality for tallgrass prairie throughout the Flint Hills. Using ranking criteria the Service will acquire the most intact, highest quality habitat available from a willing seller with the funding that is available. By preventing additional fragmentation, the Service and other conservation partners plan to help preserve tallgrass prairie habitat for future generations. Also, see the response to comment 20. **Response 25.3.** There is not a National Environmental Policy Act requirement to conduct scoping meetings, or how to specifically incorporate comments. Scoping comments were used to develop the draft EA, and were consolidated into broad categories of interest included in the "Issues Identified and Selected for Analysis" on page 5. To address substantive comments on the draft EA and page 91 of this final EA, the Service decided to use the format used here to address the comments in more detail. The text will be revised to read, "Concern about short-term activities, (including annual burning and early, intensive grazing) are having long-term impacts to the tallgrass prairie." To address the more specific, substantive comments received for the draft EA and LPP, individual comments and responses are included in Appendix G of the final EA and LPP documents. **Response 25.4.** The Service did not construct additional alternatives for controlling burning and stocking rates because as mentioned earlier, it is not feasible, or necessary, for the Service to use fee-title acquisition in the Flint Hills. The text of the draft EA has been revised to reflect additional alternatives that were considered, but not studied further, such as fee-title acquisition, or

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	and enhance the quality and diversity of fish and wildlife habitat within refuges." Since the LPP does not address the current damaging burning practices (EIS) in the Flint Hills, it will not deliver "high-quality habitat" and does not "conserve" such habitat. Thus the LPP is in violation of Executive Order 12996.	a smaller or a much larger project boundary in the "Alternatives Considered but not Studied" section (see page 10 of this final EA).
25.3	*Mis-characterization of scoping comments.* The range of comments received in the USFWS scoping meetings is mischaracterized on page 8. The USFWS does not list or describe any opposing or negative comments despite the fact that representatives of the Kansas Chapter of the Sierra Club attended one or more of these meetings and strongly criticized the lack of consideration of rangeland burning methods that destroy grassland bird habitat. Sierra Club subsequently submitted a written comment that strongly questioned whether the program would actually preserve grassland bird habitat.	**Response 25.5.** The Service considered that there would likely be little to no change in the impact to human health as a result of this project and maintains that we are not requiring landowners to change their burning practices. The Service hopes to work with landowners through the Partners for Fish and Wildlife program to influence landowners to burn less frequently, but there is no evidence that decreasing frequency would result in decreased air quality problems—if an area is burned once in three years it may produce three times the smoke when it is burned because of the increased fuel load, which may result in a no net gain across the region. Future programs such as the BlueSkyRAINS program through Kansas State propose to provide information on smoke and air quality effects from prescribed fires in the Flint Hills.
25.4	*Insufficient EA Alternatives* (page 9). NEPA requires that an EA is needed "*to evaluate reasonable alternatives that will meet the stated objective and to assess the possible impacts to the human environment*, as stated on page 31 of the EA. Yet this EA includes only one alternative (B) other than the standard "no action" alternative (A). USFWS did not construct and analyze an alternative that addresses land management and grazing practices widespread in the Flint Hills such as Early Intensive Stocking (EIS) and wholesale annual burning known to be destroying wildlife habitat.	Concerning the affects of burning on bird viewing, photography, and hiking; the Service's easements will not control burning timing or frequency, so little or no change is expected as a result of the conservation easement, and therefore, no change to human health and environment is expected. To ensure that tallgrass prairie and the grassland-dependent wildlife species are available for viewing, it is necessary to conduct prescribed burning at regular intervals to maintain the fire climax prairie ecosystem.
25.5	USFWS did not address the impacts to human health and environment of allowing these practices to continue on land covered by the LPP. For example, the EA failed to mention the fact that current burning practices are causing serious and long standing air quality problems in major urban areas in Kansas and other downwind states. KDHE has set up a website page[6] where one can view the KDHE presentation for the meeting in Newton, Kansas on April 9, 2010 which brought together various stakeholders to pursue a Smoke Management Plan. This page also includes complete information on the April 8 – 11, 2010 Flint Hills Smoke Event. For example, attached are the most recent ozone exceedances in Topeka, Wichita and at the Konza prairie near Manhattan and a representative map of a smoke plume. It is no secret that the USEPA and KDHE are seeking changes in burning practices in the Flint Hills. USFWS has an obligation under NEPA to both acknowledge and discuss the impacts of their plan in this regard.	
	In addition the USFWS acknowledges on page 20 the value and the use of the Flint Hills for bird viewing, nature photography and hiking, but the EA does not consider impacts of intensive burning practices on these activities.	
25.6	The USFWS's Alternative B focuses entirely on habitat fragmentation issues and ignores other issues that could alter the outcome, such as the impact of the existing improved road network and intensive grazing and burning practices. There are, for example, serious questions about whether even the efforts to reduce fragmentation of habitat in the LPP will succeed when the Flint Hills is already heavily fragmented by a network of improved roads that, according to Dr. Robel, are very instrumental in retarding the breeding of prairie chickens.	**Response 25.6.** The Service focused on what is within the scope of the FHLCA conservation easement project. The Service recognizes that fragmentation is a serious existing condition, and that efforts to reverse the decline in greater prairie-chicken populations face serious challenges. However, the Service considers the preservation of tallgrass prairie, resident and migratory birds, and other wildlife which may benefit from this effort, a worthy cause.
	On page 21 of the EA it is suggested that as much as 15,000 acres of intact prairie is needed to support a single prairie-chicken lek. By *intact* USFWS means a block of land that is 95%	The research referred to here is based on the lesser prairie-chicken. The Flint Hills are currently populated with greater prairie-chickens, and we have found no research that indicates that we cannot be successful in protecting greater prairie-chickens and other grassland-dependent bird species with a landscape level conservation effort supported by private landowners and other partners.
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	grassland. James Pittman, Christian Hagen, Robert Robel et al found that lesser prairie chickens would not breed at all within 252 to 465 meters of an improved road in his study of PC's in the Sand Sage Prairie of southwest Kansas.[7] Only 10% of the nests were found from 715 to 1095 meters from such roads. They defined improved roads as paved or unpaved roads that carried three vehicles or more per day, which would include both local roads and primary roads. A consultant for the Sierra Club assumed a buffer of 200 to 500 meters from such roads and 700 meters from transmission lines and overlaid the existing road grid over the Flint Hills Legacy Conservation Project area. He found that only one intact block of 15,000 acres would be available for preservation and only thirteen blocks were available in size from 5000 to 14,999 acres.[8] While this analysis may be subject to other interpretations, it does call into question the assumptions made by USFWS that prevention of further fragmentation will actually result in large areas of suitable prairie chicken habitat. At a minimum USFWS should have included a discussion in the EA of the potential for the existing road grid to undermine the goals of their project in the Flint Hills.	
25.7	*Fire History & alternate practices.* On page 13, the USFWS embarks on a lengthy description of traditional burning practices in the Flint Hills that note the desirability of a natural mosaic burning pattern. Then, incredibly, the USFWS on page 14 reduces the discussion of current burning practices to a single sentence! This clearly demonstrates the intent of the USFWS to avoid discussing this issue. Yet they acknowledge that "patch burning is more representative of historical burn regimes in the region." Further, USFWS notes on page 5 "The Service's PFW program has been working with many landowners to help restore and enhance fish and wildlife habitat on private land. PFW activities include habitat restoration and improvement (invasive plant control and grazing and *burning modifications (emphasis ours)*)." On page 17 the EA confirms that grassland birds are at risk and notes they need a "mosaic of vegetation structures." On page 24 the USFWS says the conservation easements "would support management activities such as prescribed fire, grazing, and efforts to control the spread of woody vegetation and invasive weeds" without specifying any limitations whatsoever on the nature of these activities. Then they note that "patch or rotation burning of prairie provides the mosaic of habitat conditions required by grassland birds." Patch or rotation burning is currently being practiced by few ranchers in the Flint Hills. *We conclude from the forgoing that USFWS is well aware of the need and desirability of changing burning practices in the Flint Hills.*	**Response 25.7.** See the response to comments 25.1 and 25.5.
25.8	*Annual burning not necessary.* On page 21 the USFWS confirms the LPP's focus on the fragmentation of habitat. They say fragmentation reduces the ability to burn, but they do not acknowledge that excessive annual burning is also part of the problem per our previous citations. On page 23 USFWS acknowledges that "when tall grass prairie remains unburned for 10 years or more it begins to convert to woodlands." *This also means that it is not necessary to burn every year as ranchers are currently doing under EIS practices.* *Flawed analysis and conclusions.* On page 26 USFWS incorrectly states that their program will conserve wildlife habitat. On page 29 USFWS discusses the expected cumulative impacts of the	**Response 25.8.** On page 29 of the final EA, "Cumulative Impacts—Alternative B" in fact does refer to the impact to the program goals, "This would have long-term positive impacts on wildlife habitat and result in the long-term conservation of migratory birds, threatened and endangered species, native plants, and the overall biological diversity of the Flint Hills tallgrass prairie." The other comments were previously addressed. The Service will send a copy of the final EA to the Kansas chapter of the Sierra Club, when it becomes available.

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25.9	LPP but only in terms of *acres covered*. They do not discuss cumulative impacts with respect to *program goals such as preservation of wildlife habitat*. In view of the fact that destructive practices like EIS will be allowed to continue under this program, the conclusions in this section have no basis in fact. On page 32 under "bio-planning" the Greater Prairie Chicken (GPC) is cited as the focal species, but then USFWS fails to assess the impact of annual burning practices on the GPC. **II. The Flint Hills Legacy Conservation Area Draft Land Protection Plan (See also related comments on the EA above)** The LPP lists the purposes of the program on page 2 and then fails to establish a strategy that will achieve the objective. On page 4 the USFWS confirms that landowner management practices, which would include EIS, would continue. The LPP is predicated on sustaining the current land use of livestock grazing and prescribed fire. In effect the USFWS Flint Hills Conservation Area program will be paying ranchers substantial sums of money while continuing to allow destructive agricultural practices, like EIS, that will destroy wildlife habitat. This will have two consequences that are not addressed in the EA: (1) USFWS will be using public money for a program that is very unlikely to achieve its stated objective to significantly preserve habitat. This will divert public funds from other more effective efforts across the nation; (2) The conveyance of funds to ranchers who continue to use damaging burning practices will likely retard beneficial changes in range management practices. Thus serious air quality and public health damages in Kansas will persist during the time this program is being implemented. On page 20 of the EA, the USFWS notes that many Flint Hills properties (ranches) are in the possession of absentee landowners. One of our representatives at the El Dorado open house meeting of April 21asked Mike Rich of USFWS about this, and he estimated that absentee ownership was 70%. These investors are unlikely to suffer the environmental impacts of the practices implemented by their ranch managers, but they are reaping the financial rewards. **Summary.** This EA is grossly inadequate and incomplete. As presently presented the Project is likely to divert valuable public funds from other programs in the country with a higher chance of success. In other words, it is highly likely to become an extraordinary waste of public funds. The most important flaws are: 1. The EA fails to meet the requirements of NEPA: a. The EA fails to consider or study other alternatives that are more likely to achieve the stated objectives of the program even though the USFWS clearly acknowledges that alternative range management practices are possible and desirable; b. The EA fails to consider the impacts of the Flint Hills Legacy Conservation Area LPP on the human environment in general; c. The EA fails to assess the impacts of the LPP on *air quality and human health* of paying ranchers substantial sums of money for easements which allow them to continue to conduct 5	See the responses to comments 25.1 and 25.5. **Response 25.9.** See the responses to comments 25.1, 25.2, 25.4. 25.5, and 25.6. The Service did not develop additional alternatives for controlling burning and stocking rates because as mentioned in the response to comment 25.1, it is not feasible, or necessary, for the Service to use fee-title acquisition in the Flint Hills. The text of the draft EA has been revised to reflect the alternatives that were considered, but not studied further, such as fee-title acquisition, or a much larger project boundary. The conservation easement program would seek to limit additional construction of infrastructure that would result in further habitat fragmentation. Ranking criteria will be used to select the most intact, high quality tallgrass habitat. It is not within the scope of the FHLCA project to assess the impacts of existing fragmentation from roads (or other structures) throughout the entire Flint Hills. Assessing the measure of success for the LPP will be a long-term process and will use ongoing, adaptive management strategies outlined in the Strategic Habitat Conservation strategies outlined on page 33 of the final EA. As new data and science become available, the information will be incorporated into the initial prioritization model and will be used to adjust the ranking criteria for potential acquisition parcels.

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environmentally damaging range management practices.

At present the EA is so deficient in the above respects that it is not possible to determine if a full Environmental Impact Statement is warranted.

2. The EA completely ignores the effects of current grazing and land management practices on the efficacy of the LPP and on the chances for its success;
3. The LPP fails to conform to the mission of the USFWS National Wildlife Refuge System and is in violation of Executive Order 12996.
4. The EA fails to analyze the risk that the existing fragmentation of grassland bird habitat by the existing network of roads in the Flint Hills may reduce the chance of program success.
5. The EA used the wrong measures for assessing LPP success.

The Kansas Chapter is a legal subdivision of the Sierra Club which has over one million members nationwide. The Kansas Chapter of the Sierra Club has an important interest in seeing that this program is properly designed to achieve the stated objective to preserve wildlife habitat. Members of the Chapter are interested in and participate in activities in the Flint Hills such as hiking and observation and photography of wildlife such as grass land birds. Many Chapter members live in urban areas and their health is being impacted by high ozone and particulate matter pollution from the extensive, annual burning of rangeland in the Flint Hills

We hereby request that USFWS correct the deficiencies noted above and notify the undersigned by registered US mail within 3 days of the issuance of the final EA, and that such notification include where and how a copy can be obtained.

Sincerely,

Craig S. Volland

Craig S. Volland, for the
Sierra Club
609 N. 72nd St
Kansas City, Ks 66112
913-334-0556

cc. USFWS Mountain-Prairie Region - Denver

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May 17, 2010

VIA E-MAIL AND U.S. MAIL

Amy Thornburg
Land Protection Planning
U.S. Fish and Wildlife Service
P.O. Box 25486, DFC
Denver, Colorado 80225

RE: Comments on U.S. Fish and Wildlife Service Draft Environmental Assessment and Land Protection Plan for Flint Hills Legacy Conservation Area

Dear Ms. Thornburg:

Introduction

Wind Capital Group, LLC ("Wind Capital") is a developer of utility-scale wind energy generation projects with offices in St. Louis, Missouri; Madison, Wisconsin and Chicago, Illinois. Wind Capital was formed in 2005, and has developed wind energy facilities with a generating capacity in excess of 900 MW. Wind Capital is currently developing 20 wind energy projects totaling more than 2,200 MW of capacity. The projects are located primarily in the central region of the country. Wind Capital's mission is to "develop, build and manage quality wind energy projects under the highest ethical and professional standards to "Bring Wind Energy Home®."

Wind Capital is committed to building wind projects that minimize impacts to environmentally sensitive resources and wildlife. We begin consideration of environmental resources very early in the project development process. On-going consideration of critical habitat and environmentally sensitive areas remains an integral part of project design, construction, and operation. Our dedicated environmental team oversees all aspects of site review, environmental studies, and associated permitting for our wind projects. As an owner/operator of wind energy facilities, we proactively consult with regulatory agencies, such as the U.S. Fish and Wildlife Service (FWS), throughout the project life cycle. We work with qualified environmental consultants to develop scientifically-sound study plans and to assist us with implementation. In summary, we strive to minimize potential impacts to wildlife and sensitive habitat areas at our wind project sites.

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26	Ms. Amy Thornburg May 17, 2010 Page 2 In addition, Wind Capital actively participates in the AWEA Siting and Permitting Committees.[1] These Committees are working collaboratively with the FWS to develop project siting guidelines, regional habitat conservation plans, and consistent survey protocols. With this in mind, please consider our comments on the draft Land Protection Plan for Flint Hills. **Background and General Comments** Wind Capital focuses wind development efforts primarily in the central region of the United States, including Kansas and Oklahoma. We currently are developing several projects in close proximity to the proposed Flint Hills Legacy Conservation Area (FHLCA), as currently outlined in the Draft Environmental Assessment and Land Protection Plan. These projects are at various stages of development, and we have actively engaged with local FWS staff throughout the development process. Wind Capital is an interested and vested Stakeholder in the FHLCA proposal. We are concerned that this proposal will limit, and even prevent, wind development in this region. Wind energy is a clean, renewable source of energy that is important to our Nation's economy. This renewable source of energy is highly protective of the environment. Wind energy is compatible with the protection of wildlife, highly-valued land resources and habitat areas, and environmental resource such as the Flint Hills area. Wind Capital respectfully submits the following specific comments on the proposed FHLCA Draft Environmental Assessment (EA) and Land Protection Plan ("EA/LPP"). **Specific Comments** **I. The Proposed Action will have a significant impact on wind power development, and will conflict with policies previously announced by the U.S. Department of Interior to promote renewable energy.** The "Proposed Action" of the FHLCA EA/LPP is to establish a voluntary conservation easement program in eastern Kansas under which the FWS would acquire conservation easements on 1.1 million acres of land within a 3.3 million acre project boundary area. As proposed, the FHLCA conservation easements would explicitly prohibit commercial and industrial-scale development of wind energy. See Draft FHLCA EA, p. 24. This prohibition on wind energy development conflicts with the Secretary of the U.S. Department of Interior's (DOI) policy declarations with respect to renewable energy development and climate change. Specifically, in March 2009, Secretary Salazar issued Order 3285, declaring that one of the DOI's "highest priorities" is to encourage the [1] Wind Capital has reviewed the separate comments on the Proposed Action submitted by AWEA and supports those comments.	**Response 26.** (Background and general comments) Wind energy development is not inherently compatible, or incompatible, with wildlife and habitat protection. An assessment needs to be made based on the requirements of the species involved. Preliminary studies indicate tall vertical structures fragment large tracts of otherwise appropriate habitat, making it unsuitable for interior grassland species such as greater prairie-chickens in Kansas. A number of authors have addressed the fragmentation effects of infrastructure on prairie grouse (Kuvlesky et al. 2007, McDonald et al. 2009, Giesen 1994, Fuhlendorf et al. 2002, Robel 2002). See specific information on ecological impacts and responses of fragmentation on pages 23–26 of the final EA.
26.1		**Response 26.1.** The mission of the U.S. Fish and Wildlife Service is working with others to conserve, protect, and enhance fish, wildlife, plants, and their habitats for the continuing benefit of the American people. The mission of the National Wildlife Refuge System is to preserve a national network of lands and waters for the conservation, management and, where appropriate, restoration of fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans. The Flint Hills Legacy Conservation Area project would be administered as part of the Refuge System in accordance with the National Wildlife Refuge System Administration Act of 1966 and other relevant legislation, executive orders, regulations, and policies (page 6 of the final EA). The Service supports the U.S. Department of the Interior policy on renewable energy development, including Secretarial Orders 3285 and 3289. However, the strategies contained in these Secretarial Orders are to be addressed for appropriate areas on public lands and the outer continental shelf. The Flint Hills Legacy Conservation Area project would be administered as part of the Refuge System in accordance with the National Wildlife Refuge System Administration Act of 1966 and other relevant legislation, executive orders, regulations, and policies (see page 6 of the final EA). A significant directive of the Refuge Administration Act is to ensure that the U.S. Fish and Wildlife Service maintains the biological integrity, diversity, and environmental health of the National Wildlife Refuge System for present and future generations of Americans. Fragmentation of the National Wildlife Refuge System's wildlife habitats is a direct threat to the integrity of the National Wildlife Refuge System, both today and in the decades ahead. Uses that we reasonably anticipate may reduce

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	Ms. Amy Thornburg May 17, 2010 Page 3 production, development, and delivery of renewable energy. See U.S. DOI, Secretary Salazar, Order No. 3285 (March 11, 2009). In that Order, Secretary Salazar declared that "[a]gencies and bureaus within the [DOI] will work collaboratively with each other, and with other Federal agencies, departments, states, local communities, and private landowners to encourage the timely and responsible development of renewable energy and associated transmission while protecting and enhancing the Nation's water, wildlife, and other Natural Resources." Id. To achieve this, Secretary Salazar established a Department Task Force on Energy and Climate Change. Id. In a subsequent order, issued in February 2010, Secretary Salazar renamed the "Climate Change Response Council" within the Office of the Secretary to the "Energy and Climate Change Council," and tasked the newly-named Council with, *inter alia*, executing a coordinated DOI-wide strategy to address renewable energy efforts. See U.S. DOI, Secretary Salazar, Order No. 3289, Amendment No. 1 (Feb. 22, 2010). The Council is to help coordinate activities within and among the DOI's agencies and bureaus to develop and implement an integrated strategy for responding to renewable energy efforts and climate change impacts on resources managed by the DOI. Id. Further, with respect to climate change planning, Secretary Salazar ordered each bureau and office of the DOI to consider and analyze potential climate change impacts when undertaking long-range planning exercises, developing multi-year management plans, and making major decisions regarding potential use of resources under the DOI's purview. Id. These declarations by Secretary Salazar, and other federal government renewable energy policy initiatives not summarized herein, recognize the vital national interests advanced by development of renewable energy and corresponding reductions in carbon emissions. Further, these declarations make it clear that all activities of the agencies within DOI must be considered in light of, and balanced with respect to, the nation's interest in encouraging "timely and responsible development of renewable energy" resources. The FHLCA EA/LPP does not acknowledge these DOI national policies, or discuss how a balance will be struck between the conservation interests which the Proposed Action seeks to promote and the DOI's strong interest in encouraging responsible renewable energy development. The Proposed Action would prohibit wind energy development within the FHLCA – an area of over 1 million acres which the EA acknowledges has "high potential for wind development." See Draft FHLCA EA, p. 22. Further, implementing the Proposed Action likely would lead to additional restrictions on areas near, but not within the FHLCA, through the review of impacts on the FHLCA under the National Environmental Policy Act ("NEPA"), or through the Endangered Species Act section 7 consultation process in connection with other federal permits. These potential secondary impacts are not acknowledged in the EA for the Proposed Action. Moreover, the Proposed Action promotes fossil fuel extraction activities to the detriment of renewable energy development because it would allow subsurface exploitation of land within the FHLCA for oil and gas so long as the surface activities related to those activities do not occur on parcels within the FHLCA. See, e.g., EA, p. 24. This tailoring of the Proposed Action to allow oil and gas production, but prohibit	
26.2		the quality or quantity or fragment habitats on a national wildlife refuge would not be consistent with Service policy. The FHLCA project would use voluntary conservation easements that would be acquired from willing sellers only. The easement program would to a large extent maintain existing conditions for landowners and the general public, and will not significantly affect the quality of the human environment, and will not have a close causal connection to a change in the physical environment (40 CFR 1508.27). The U.S. Fish and Wildlife Service will continue to work collaboratively with individuals, nongovernment organizations, federal, state, and local agencies on a variety of issues, including renewable energy development. The Service has initiated a program using LCCs as a means of addressing conservation and climate change challenges through partnership opportunities (see page 35 of the final EA).
26.3		Additionally, through the FHLCA project the Service seeks to conserve part of remaining 4% of relatively intact tallgrass prairie habitat, thereby providing more system resiliency in a changing climate by maintaining a migration corridor for migratory grassland birds, and also by providing carbon sequestration benefits (page 27 of the final EA). Currently the FHLCA provides a significant north-south migration corridor for grassland birds, and links many areas of high quality tallgrass habitat (page 14 of the final EA). Retaining migratory corridors is a key adaptation strategy for wildlife response to climate change (S03289, USFWS 2009). The FHLCA project would use voluntary conservation easements that would be acquired from willing sellers only. Landowners could continue to pursue energy development on their land without Service conservation easements. The easement program would to a large extent maintain the existing conditions for landowners and the general public, and will not significantly affect the quality of the human environment, and will not have a close causal connection to a change in the physical environment (40 CFR 1508.27).
26.4		

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26.5	Ms. Amy Thornburg May 17, 2010 Page 4 use of parcels within the FHLCA for wind energy production, cannot be reconciled with the policies expressed in Orders 3285 and 3289. Wind Capital supports the goals of prairie and grassland preservation. However, Wind Capital also believes that such preservation should be harmonized with other important national goals and priorities, in particular with the national policies that support responsible wind energy development. We submit that, without significant change, and meaningful consideration of additional alternatives not addressed in the EA/LPP (see below), the Proposed Action cannot be found to be consistent with those policies. Therefore, the Proposed Action should not be approved until it is (a) reviewed for consistency with the DOI's policies by the Task Force on Energy and Climate Change established by Order 3285 and the Energy and Climate Change Council established by Order 3289, and (b) those bodies determine that it is consistent with the policies articulated by the Orders.	**Response 26.2.** Although the Service supports renewable energy development, it is beyond the scope of this project to incorporate a discussion of all national policies, energy programs, recommendations, and initiatives. Through the FHLCA project the Service seeks to conserve part of a remaining 4% of relatively intact tallgrass prairie habitat, thereby providing more system resiliency in a changing climate by maintaining a migration corridor for migratory grassland birds, and by providing carbon sequestration benefits (page 25 of the final EA). From the final EA page 14, "Currently, the FHLCA provides a significant north-south migration corridor for grassland birds, and links many areas of high quality tallgrass habitat. Retaining migratory corridors is a key adaptation strategy for wildlife response to climate change (S03289, USFWS 2009)."
	II. The FHLCA EA/LPP does not account adequately for the existing and ongoing FWS programs designed to balance wind energy development with species and habitat protection.	
26.6	For years, FWS has administered programs and measures which have sought to balance the development of renewable energy resources with habitat and species protection and conservation goals. In recent years, these measures have included species and habitat-related consultations conducted, and impact avoidance and mitigation measures developed, under section 7 of the Endangered Species Act, the Migratory Bird Treaty Act, the Bald and Golden Eagle Protection Act, and NEPA. In the future, the measures also are likely to include the Recommended Guidelines submitted by the Wind Turbine Guidelines Advisory Committee to the Secretary of Interior on March 4, 2010 ("Recommended Guidelines"). The Committee developed the Guidelines to present "the most effective, feasible, practicable and appropriate approaches available to the Department of Interior, Tribes, states, local jurisdictions, and the wind industry to address their respective responsibilities to protect wildlife resources while encouraging responsible siting and operation of wind energy projects." See U.S. Fish and Wildlife Service, Wind Turbine Guidelines Advisory Committee, p. 1.	**Response 26.3.** The Service is not proposing a buffer zone, or any development restrictions other than areas where Service conservation easements are in place. The conservation easements are voluntary and in no way restrict use on neighboring lands. All federal, state, and local regulations would still apply whether the Service has an easement in the area or not. Rather than increase the likelihood of additional requirements under the Endangered Species Act, one of the purposes of the FHLCA is to support the recovery and protection of threatened and endangered species and reduce the likelihood of future listings under the Endangered Species Act (final EA page 4).
26.7	However, the EA/LPP does not adequately address the development of wind energy resources within the context of these existing policies. The EA/LPP simply assumes that *any* wind power development would be contrary to the conservation aims of the FHLCA. Wind Capital believes, contrary to the assumption embedded in the EA/LPP, that responsible wind energy development and grassland habitat preservation are compatible objectives. The Proposed Action should not be implemented until the EA/LPP is revised to give meaningful consideration to whether development of wind energy resources consistent with the Recommended Guidelines, and with the habitat and protected species impact avoidance and mitigation measures typically required for wind energy projects, can be accommodated within the FHLCA. Such consideration is needed not only to assure that Orders 3285 and 3289 are given proper effect, but also to give effect to the purposes for which the Guidelines were developed. Proper consideration of the Recommended Guidelines will require analysis of whether the conservation purposes of the FHLCA could be achieved if responsible wind energy development in accordance with the Recommended Guidelines were allowed to proceed in portions of the FHLCA.	**Response 26.4.** The Service is not biased against wind, or other forms of energy development. The Service would consider development of energy and mineral resources on the easement properties, if they can be implemented without fragmenting the grassland habitat. Although at least one Kansas county (Wabaunsee) has passed an ordinance banning commercial wind farms countywide, it would be speculative to anticipate potential secondary impacts for the Flint Hills. The Service is not promoting oil and gas extraction over other forms of energy development. On properties where wind, oil and gas, or mineral rights have already been sold (severed from the estate), the Service will work with landowners and developers to minimize any negative impacts of development and extraction activities (50 CFR 25.11). On land where the rights for wind, oil and gas, or mineral development have not been sold (estate is

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26.8	Ms. Amy Thornburg May 17, 2010 Page 5 The assumption that wind power development can never be carried out in a manner that would enable the conservation goals of the FHLCA to be achieved does not constitute adequate consideration of whether a balance can be struck between wind energy development and the conservation goals of the Proposed Action. **III. The FHLCA Draft EA Fails to Meet the NEPA Standards for EAs** A. The "Alternatives" Analysis is Over-Simplified and Inadequate 40 CFR § 1508.9 requires that EAs include "discussions of alternatives as required by section 102 (2)(E) of NEPA. Section 102 (2)(E) requires that agencies study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources. The alternatives analysis in Chapter 2 of the EA does not satisfy these requirements. It identifies only two alternatives for the proposed project – either a "no-action" alternative or the "proposed action" to give the FWS authority to create the FHLCA. This "alternatives" analysis is over-simplified, especially considering the agency's own acknowledgement that the proposed FHLCA area has a "high potential for wind development." Notably, the "alternatives" analysis does not consider a wide range of options that exist beyond the status quo "no-action" approach and the proposed action. For example, other alternatives that should have been considered include: a smaller sized conservation area; limiting the conservation area to land within better defined boundaries, designed also to accommodate wind energy development; identification of siting guidelines and mitigation measures that would enable wind energy development to proceed within the conservation area; use of local land use authority or other federal permitting authorities to control development; and the impacts of development consistent with the guidelines recently developed by the Wind Turbine Guidelines Advisory Committee. Chapter 2 of the draft EA should be amended to include a much more rigorous review of alternatives and not simply adopt an oversimplified, "all-or-nothing" analytical approach.	still intact), conservation easements would require non-surface occupancy (off-site development) for any future development activities. The Service would consider development of energy and mineral resources on the easement properties, if they can be implemented without disturbing the surface or creating vertical barriers, which would fragment the grassland habitat for wildlife. The Service respectfully disagrees that the proposed action is inconsistent with energy policy. The U.S. Fish and Wildlife supports the U.S. Department of Interior policy on renewable energy development, including Secretarial Orders 3285 and 3289. However, the strategies contained in these Secretarial Orders are to be addressed for appropriate areas on public lands and the outer continental shelf. The Flint Hills Legacy Conservation Area project would be administered as part of the Refuge System in accordance with the National Wildlife Refuge System Administration Act of 1966 and other relevant legislation, executive orders, regulations, and policies (see page 6 of the final EA). A significant directive of the Refuge Administration Act is to ensure that the U.S. Fish and Wildlife Service maintains the biological integrity, diversity, and environmental health of the National Wildlife Refuge System for present and future generations of Americans. Fragmentation of the National Wildlife Refuge System's wildlife habitats is a direct threat to the integrity of the National Wildlife Refuge System, both today and in the decades ahead. Uses that the Service reasonably anticipates may reduce the quality or quantity, or fragment habitats on a national wildlife refuge would not be consistent with Service policy. **Response 26.5.** See responses to comments 26.1 and 26.2 regarding Service mission and policy.
26.9	B. The Summary of the "Affected Environment" is also Inadequate Although Chapter 3 ("Affected Environment") of the draft EA references how the FHLCA conservation easement program would advance the FWS's strategic response to climate change issues by preserving the character of the tallgrass prairie of the Flint Hills and securing the existing carbon stores to sequester atmospheric carbon, Chapter 3 remains entirely silent on another of FWS/DOI's strategic goals – the production, development, and delivery of renewable energy. See Draft FHLCA EA, p. 12. In addition, Chapter 3 omits any reference to wind energy development and its related beneficial economic impact on local communities in the "Socioeconomic Environment" analysis section. Id. at pp. 19-20. Chapter 3 of the draft EA should be revised to address those issues adequately and fairly as part of the affected environment.	**Response 26.6.** The Service respectfully disagrees with this assessment. Although wind energy and grassland habitat preservation may be compatible, the biological requirements vary for wildlife species and location. In some areas, such as some areas of North and South Dakota, initial studies indicate that waterfowl are able to use areas with wind energy developments. The proposed Wind Turbine Guidelines Advisory Committee recommendations are currently under review by the Secretary of Interior, and are not approved policy. Upon approval, the Service will incorporate the policy for the FHLCA project, including the proposed Tier 1 evaluation and the considerations listed for sage and prairie grouse that merit special attention for several reasons.
26.10	C. The "Environmental Consequences" Analysis is Conclusory and Insufficient 1. *Effects on the Biological Environment*	

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26.10	Ms. Amy Thornburg May 17, 2010 Page 6 The draft EA's assessment of the biological effects of the "no action" alternative and the "proposed action" provides only a cursory analysis of the impacts of the FHLCA conservation easement program and misconstrues the current restrictions placed on wind development by the FWS, as well as by other local, state and federal agencies. For example, with respect to the proposal's affect on wildlife habitat, the draft EA states that: > [I]f projects are sited without regard for ecological resources, wind power poses a serious risk to wildlife in some of North America's most diminished and ecologically sensitive habitats. Development of wind power poses a particularly high risk for the Flint Hills, because economically viable wind resource areas and conservation priority areas show a high level of geographic congruence.	"[The] scale and biotic nature of habitat requirements, ranges, and habitats are highly congruent with the nation's richest inland wind resources, known impacts of anthropogenic features (tall buildings, structures, energy facilities, roads, etc.) (Wind Turbine Advisory Committee Draft, USFS 2010)." The text of the draft EA has been revised to include Service Interim Guidance on Avoiding and Minimizing Wildlife Impacts from Wind Turbines (2003) which recommends avoiding "placing turbines in habitat known to be occupied by prairie grouse or other species that exhibit extreme avoidance of vertical features or structural habitat fragmentation (see page 26 of the final EA). In known prairie grouse habitat, avoid placing turbines within 5 miles of known leks (communal pair formation grounds)." While wind turbines may be compatible with some wildlife species in other areas of Kansas, the Flint Hills tallgrass prairie dependent species have demonstrated sensitivity to vertical structures and habitat fragmentation. See also the response to comment 26.2.
26.11	See Draft FHLCA EA, p. 23. The draft EA *assumes* that wind energy projects will be "sited without regard for ecological resources" and ignores the FWS's current coordination with wind developers in the permitting process with respect to ecological resources, including species and habitat protection (as discussed above), as well as the potential effect of wind energy development consistent with the guidelines recently developed by the Wind Turbine Guidelines Advisory Committee (also as discussed above). Specifically, that Committee developed the Guidelines to present "the most effective, feasible, practicable and appropriate approaches available to the Department of Interior, Tribes, states, local jurisdictions, and the wind industry to address their respective responsibilities to protect wildlife resources while encouraging responsible siting and operation of wind energy projects." See U.S. Fish and Wildlife Service, Wind Turbine Guidelines Advisory Committee, Recommended Guidelines, Submitted to the Secretary of Interior on March 4, 2010, p. 1.	**Response 26.7.** See responses to comments 26.1, 26.5, and 26.6.
26.12	By disregarding the fact that wind development occurs with the coordination and cooperation of the FWS and other agencies and can and does occur with consideration for ecological resources, including species and habitat protection, the agency has made an overly broad and invalid assumption. This key assumption places the entire impact analysis in the EA on an invalid footing, and renders the impact analysis inadequate, arbitrary and capricious.	**Response 26.8.** The Service respectfully disagrees with this statement. The decision of whether to establish a new unit Conservation Area of the National Wildlife Refuge System is a decision of whether to proceed with establishment, or not. Thus, Conservation Area LPPs typically involve two alternatives, a no action (non-acquisition alternative), and an acquisition option that will establish a new unit of the National Wildlife Refuge System. The text of the EA has been revised to reflect the additional alternatives that were considered, but not studied further, such as fee-title acquisition, or an option considering a much larger project boundary.
26.13	2. *Effects on the Socioeconomic Environment* Although this section of the draft EA does address wind energy development, it does so in only the most cursory manner. For example, the very first statement about the "no action" alternative asserts that the FHLCA would "remain in private ownership, having no additional restrictions" and landowners could profit by allowing wind energy infrastructure on their land. See Draft FHLCA EA, p. 27. The EA's reference to "no additional restrictions" mischaracterizes the current permitting regimes that apply to the development of wind energy projects and related transmission infrastructure, and ignores the existing restrictions on turbine and access road placement, species and habitat protection, and mitigation measures imposed by local, state and federal permitting entities.	When the decision to establish a new refuge is being made, Service policy is to acquire land only when other means, such as zoning or regulation, of achieving program conservation goals and objectives are not appropriate, available, or effective. When lands are to be acquired, the minimum interest necessary to reach management objectives is considered. If fee-title is required, full consideration will be given to extended use reservations, exchanges, or other alternatives that will lessen impact on the owner and the community.

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26.14	Ms. Amy Thornburg May 17, 2010 Page 7 In addition, the discussion of the "no action" alternative does not even acknowledge the renewable energy benefits of wind power generation or the economic impact that wind developments bring to local communities, in addition to the revenue generated for landowners. Secretary Salazar has stated that….if the U.S. fully pursues its potential for wind energy on land and offshore, wind can generate as much as 20 percent of our electricity by 2020 and create a quarter-million jobs in the process. As President Obama has said:it's a win-win. Good for the environmental, great for the economy. See Remarks of Secretary of Interior Salazar, "New Energy Future: The Role of Public Lands in Clean Energy Production and Carbon Capture," U.N. Conference on Climate Change, Copenhagen, Denmark, Dec. 10, 2009.	A rationale of why the Service has decided to use conservation easements to achieve its conservation purposes for the FHLCA project instead of other alternative is given under the "Alternatives Considered but not Studied" section on page 10 of the final EA. The analysis and information provided throughout the draft EA led to the definition of the project-approved acquisition boundary and the maximum acreage to be acquired by the Service for the FHLCA. Some of the factors considered in the EA include the narrowness of the intact prairie habitat in the north-south migration corridor, the rapid encroachment by trees, and residential and commercial development. The project acquisition acreage represents less than 1% of the physiographic boundary of the historic range of tallgrass prairie and only 2% of the potential wind energy development in Kansas.
26.15	Further, the "proposed action" analysis asserts, without support, that the FHLCA's conservation easement program would affect the "location and distribution, not rate or density of wind energy infrastructure." See Draft FHLCA EA, p. 28. This is simply untrue. Wind energy projects need to be sited to take maximum advantage of wind resources, and sufficient spacing between turbines is necessary to avoid wake effects on downwind turbines. If wind energy development were to be prohibited on over a million acres, such restriction will necessarily affect the rate or density of wind energy infrastructure that could be developed in an area with an important wind resource.	The Service acquires easements from willing sellers only. Landowners could continue to pursue energy development on their land without Service conservation easements. As a result, the eventual conservation mosaic/pattern will in large part be driven by the availability of willing sellers. Acquisition within the project area is based on the level of participation by willing sellers and available funding. It is an inherent fact that considerably fewer acres may be acquired within the FHLCA, resulting in a much smaller project area.
26.16	Further, the EA fails entirely to consider how the creation of the FHLCA would impact development of wind energy facilities outside of the boundaries ultimately established for the Area, but in proximity to the Area. Once created, a new, federally managed conservation area will undoubtedly need to be considered in any section 7, NEPA, and state and local environmental impact analyses of projects located near such an area.	**Response 26.9.** It is beyond the scope of this project to incorporate details of all individual Department of the Interior strategic goals in this, or any other EA. See the response to comment 26.1 on the U.S. Fish and Wildlife Service and the National Wildlife Refuge System missions.
26.17	3. *Unavoidable Adverse Impacts; Irreversible and Irretrievable Commitments of Resources; Short-term Use vs. Long-term Productivity; Cumulative Impacts* The EA addresses the Proposed Action's unavoidable adverse impacts, irreversible and irretrievable commitments of resources, short-term use vs. long-term productivity and the cumulative impact of the Proposed Action in less than two pages. The treatment of these areas is brief and inadequate, even when compared to EAs for other FWS/DOI conservation areas. The EA's analysis (or lack thereof) within these categories fails to consider the impact of reduced renewable energy development in the short or long term and fails to acknowledge that it is possible to develop wind energy resources *and* achieve the conservation aims that the creation of the FHLCA is intended to achieve. For the reasons discussed herein, the EA does not satisfy the requirements of NEPA, and does not provide a fair or balanced basis for a determination of significance of the environmental impacts of the Proposed Action. Wind Capital submits that the	The "Affected Environment" section is a discussion of the existing biological and socioeconomic environment conditions and potential effects of the alternatives on those conditions. Any discussion of beneficial economic impacts of wind energy development on local communities would be speculative, due in part to the voluntary nature of landowner participation in selling wind leases. See also the response to comment 26.4. **Response 26.10.** The EA addresses only the restrictions that would result from the proposed conservation easement program. All other local, state, and federal restrictions and laws would still be applicable. The text will be revised to remove the first sentence of the statement of the draft EA that states, "if projects are sited without regard to ecological resources, wind power poses a serious

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26.18	Ms. Amy Thornburg May 17, 2010 Page 8 FWS cannot properly make a determination of significance based upon the EA as it currently stands. **Conclusion** Thank you for the opportunity to submit these comments. Wind Capital is committed to working with the FWS to find solutions to move development of wind facilities forward while also minimizing impacts to environmentally sensitive resources and advancing important preservation priorities. We would welcome the opportunity to discuss the concerns discussed herein with the Region 6 and National Wildlife Refuge staff, Steve Guertin, Regional Director and Noreen Walsh, Deputy Regional Director of Region 6 and responsible management to which the Directors report. We are confident that, if we work together, a path forward can be developed that balances all of the competing considerations and policies. Respectfully submitted, George M. Knapp General Counsel	risk to wildlife in some of North America's most diminished and ecologically sensitive habitats" (see page 28 of the final EA). See also the response to comment 26.3. **Response 26.11.** The Service respectfully disagrees with the assessment that it is assumed that the project *will be* sited without regard for ecological resources. Text in the draft EA says, "*if* projects are sited without regard to ecological resources, wind power poses a serious risk to wildlife in some of North America's most diminished and ecologically sensitive habitats." This text will be removed. The proposed Wind Turbine Guidelines Advisory Committee guidelines, currently under review, describe a number of concerns and considerations associated with wind energy development that would affect grassland wildlife species found in the FHLCA, based on biological and habitat requirements. See the response to comment 26.6. The EA addresses only the restrictions that would result from the proposed conservation easement program. All other local, state, and federal restrictions and laws would still be applicable. In addition, the proposed Wind Turbine Guidelines Advisory Committee recommendations are currently under review by the Secretary of Interior, are not approved policy, and hence cannot be included in the EA. **Response 26.12.** The Service respectfully disagrees with the assertion that overly broad and invalid assumptions have been made regarding coordination and cooperation. The Service believes that coordination and communication regarding conservation of ecological resources is essential. The Service will continue to work collaboratively with individuals, nongovernment organizations, federal, state, and local agencies on a variety of issues, including renewable energy development. The Service has initiated a program using Landscape Conservation Cooperatives (LCCs) as a means of addressing conservation and climate change challenges through partnership opportunities (see page 35 of the final EA). See also the response to comment 26.6. **Response 26.13.** The language of the draft EA will be changed to reflect that there would not be any additional *Service* restrictions, and that landowners could potentially profit by allowing wind energy infrastructure on land that does not have conservation easements (see page 28 of the final EA).

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27	AWEA THE WIND COALITION May 17, 2010 U.S. Fish and Wildlife Service, Mountain-Prairie Region Flint Hills National Wildlife Refuge 530 Maple Avenue Hartford, Kansas 66854 Attention: Vic Elam and Amy Thornburg Re: Comments on the Draft Environmental Assessment and Land Protection Plan, Flint Hills Legacy Conservation Area Dear Mr. Elam and Ms. Thornburg: This letter sets forth the comments of the American Wind Energy Association ("AWEA") and the Wind Coalition on the Draft Environmental Assessment ("EA") and Land Protection Plan ("LPP") for the Flint Hills Legacy Conservation Area ("FHLCA"), prepared by the U.S. Fish and Wildlife Service ("FWS") pursuant to the National Environmental Policy Act ("NEPA") and FWS policy.[1] The draft EA and accompanying LPP outline the actions that FWS believes are necessary to establish the conservation area and assess the potential impacts of the proposed conservation easement program ("the Program") in the Flint Hills region. According to the EA, the outcome of the assessment will be to determine whether FWS should proceed with the establishment of the Program. AWEA is a national trade association representing a broad range of entities with a common interest in encouraging the expansion and facilitation of wind energy resources in the United States. AWEA members include wind turbine manufacturers, component suppliers, project developers, project owners and operators, financiers, researchers, renewable energy supporters, utilities, marketers, customers and their advocates. AWEA appreciates the opportunity to comment on the EA and the LPP. The Wind Coalition is a non-profit association formed to encourage the development of the vast wind energy resources of the south central United States. The Wind Coalition is [1] We note that these comments are being submitted on May 17 and the official comment date was May 15. In light of the fact that the end of the comment period fell on a weekend (a Saturday), AWEA sought leave from the FWS to submit comments on the close of the next business day and was granted such relief on Monday, May 17. *See* E-mail Correspondence from Gene Grace, AWEA, and Amy Thornburg, FWS (May 13) (on file with AWEA). 1	The EA addresses only the restrictions that would result from the proposed conservation easement program. All other local, state, and federal restrictions and laws would still be applicable. **Response 26.14.** Any discussion of beneficial economic impacts of wind energy development on local communities would be speculative, due in part to the voluntary nature of landowner participation in selling wind leases. **Response 26.15.** See the response to comment 9. **Response 26.16.** Discussion of the impact of wind energy facilities outside of the FHLCA is beyond the scope of the EA. **Response 26.17.** The FHLCA project will utilize voluntary conservation easements that would be acquired from willing sellers only. Landowners could continue to pursue energy development on their land without Service conservation easements. The easement program would to a large extent maintain the existing conditions for landowners and the general public, and will not significantly affect the quality of the human environment, and will not have a close causal connection to a change in the physical environment (40 CFR 1508.27). Although it is not necessary to address "the relationship between short-term uses of man's environment and the enhancement of long-term productivity" and "irreversible or irretrievable commitments of resources" in an EA, the text has been revised to include additional information on "Irreversible and Irretrievable Commitments of Resources" in the final EA (see page 30). **Response 26.18.** Thank you for your comments. **Response 27.** (Background and general comments) The Service believes that wind energy development is not inherently compatible, or incompatible, with wildlife and habitat protection. Preliminary studies indicate tall vertical structures fragment large tracts of otherwise appropriate habitat, making it unsuitable for interior grassland species such as greater prairie-chickens in Kansas. A number of authors have addressed the fragmentation effects of infrastructure on prairie grouse (Kuvlesky et al. 2007, McDonald et al. 2009, Giesen 1994, Fuhlendorf et al. 2002, Robel 2002). See specific information on ecological impacts and responses of fragmentation on pages 23–26 of the final EA. Although at least one Kansas county (Wabaunsee) has passed an ordinance banning commercial wind farms countywide it would be speculative to anticipate potential additional restrictions in other areas.

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	particularly active in Kansas. Its members include developers, manufacturers and public interest advocates. The purpose of the Program is to conserve important tallgrass habitat for fish and wildlife resources through the acquisition of conservation easements from willing sellers on up to 1.1 million acres in the Flint Hills region. AWEA and the Wind Coalition agree that the Flint Hills is a unique and highly diverse area of the United States and that the integrity of tallgrass prairie wildlife habitat, stream, and water quality of this area should be protected from incompatible development. AWEA and the Wind Coalition, however, believe that if the Program is finalized, as currently proposed, it would categorically preclude wind energy development in an extremely large area without sufficient analysis or justification for taking that step. Specifically, placing up to 1.1 million acres of private lands under restrictive easements that would not allow for any wind energy development in an area that is optimal for wind power production should only be undertaken based on an informed decision-making process. We are particularly concerned that the approach taken here could be replicated elsewhere and that additional land around the country could be restricted without adequate review or procedural protection. This is especially true in light of the fact that wind energy is an important renewable resource for the region and for national policy, and current research demonstrates that wind energy and habitat protection can be compatible. Therefore, AWEA and the Wind Coalition offer the following comments below to be considered in further refining this Program to ensure that it proceeds, consistent with an appropriate NEPA evaluation, with respect to whether or not wind development is compatible with the conservation goals of the FHLCA.	
27.1	**Comment 1 – Failure to consider national energy policy.** While AWEA and the Wind Coalition are supportive of FWS's habitat protection goals, as contemplated in the Program, we are concerned that the Program's blanket preclusion of wind energy development in a large swath of eastern Kansas is unjustified. It appears that the intent of the Program is to utilize restrictive conservation easements to exclude wind energy, as well as other some other development activities, entirely from this enormous area in order to reduce habitat fragmentation, as described in the EA's Purpose and Need section (EA, p. 5). This outcome, without any consideration of the countervailing benefits of wind energy or, as discussed further below, its potential compatibility with habitat protection at any sites within the 1.1 million acres to be covered by easements, would be contrary to the critical national goals of promoting clean, renewable wind energy. Clean energy presents one of the best means to reduce greenhouse gas emissions and their contribution to climate change, which the EA acknowledges "presents additional challenges to habitat conservation in the [Flint Hills]" (EA, p. 21). Accordingly, we urge to the FWS to consider these benefits in its further evaluation of this Program.	**Response 27.1.** The Fish and Wildlife supports U.S. Department of Interior policy on renewable energy development, including Secretarial Orders 3285 and 3289. However, the strategies contained in these Seretarial Orders are to be addressed for appropriate areas on *public* lands and the outer continental shelf. The FHLCA project would be administered as part of the Refuge System in accordance with the National Wildlife Refuge System Administration Act of 1966 and other relevant legislation, executive orders, regulations, and policies (see page 6 of the final EA). A significant directive of the Refuge Administration Act is to ensure that the U.S. Fish and Wildlife Service maintains the biological integrity, diversity, and environmental health of the National Wildlife Refuge System for present and future generations of Americans. Fragmentation of the National Wildlife Refuge System's wildlife habitats is a direct threat to the integrity of the National Wildlife Refuge System, both today and in the decades ahead. Uses that the Service reasonably anticipates may reduce the quality or quantity or fragment habitats on a national wildlife refuge would not be consistent with Service policy. Currently the FHLCA provides a significant north-south migration corridor for grassland birds, and links many areas of high quality tallgrass habitat (page 14 of the final EA). Retaining migratory corridors is a key adaptation strategy for wildlife response to climate change (USFWS 2009).
27.2	**Comment 2 – Failure to consider the Wind Turbine Guidelines Advisory Committee report.** Throughout the EA, wind energy is presumed to be inherently and unavoidably incompatible with habitat protection. There is no recognition of even the possibility that careful siting, with the use of best practices and mitigation measures during project	**Response 27.2.** The Service respectfully disagrees with the assessment that an overbroad presumption has been made. Although wind energy and grassland habitat preservation may be compatible, the biological requirements vary for wildlife species and location. In some areas, such as some areas of North and South Dakota, initial studies indicate that waterfowl are able to use areas with wind energy development. The proposed Wind Turbine Guidelines Advisory Committee recommendations are currently under review by the Secretary of Interior, and are not approved policy. Upon approval, the Service will incorporate the policy for the FHLCA project, including the proposed Tier 1 evaluation and the considerations listed for sage and prairie grouse that merit special attention for several reasons.

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27.3	construction and operation, could allow wind energy and habitat to coexist within the FHLCA. This overbroad presumption is unsupported and inconsistent with other FWS guidance and actions. On March 4, 2010, the Acting Director of FWS transmitted to the Secretary of the Interior a report by the Wind Turbine Guidelines Advisory Committee ("Advisory Committee"), convened under the Federal Advisory Committee Act, which included representatives of FWS, the Department of Energy, other federal, state and tribal governments, wildlife conservation organizations and the wind industry. This diverse and broadly representative group recommended to the Secretary a set of guidelines that provide a tiered approach for case-by-case, site-specific analysis of wind energy proposals. The guidelines do *not* presume that wind power generation and habitat protection are inherently incompatible. On the contrary, the Tier 1 analysis considers "landscape considerations" and habitat fragmentation issues, while later tiers (Report, pp. 34-35 and 41-42) consider the issues of tallgrass prairie habitat and protection for prairie chickens and sage grouse. Specifically, on these issues, the guidelines call for case-by-case investigation at multiple stages in the tiered process, in contrast to the EA's presumption of categorical incompatibility with wind energy in prairie chicken and sage grouse habitat. While carefully addressing habitat fragmentation issues, both substantively and procedurally, the Advisory Committee report contains nothing that would justify broadly excluding whole swaths of a state from wind energy development without any real review of whether or not wind development is compatible with the conservation goals of the FHLCA. The Advisory Committee report (Report, p. 13) also notes that the Secretary of the Interior has directed FWS and other Department of Interior bureaus to develop "Landscape Conservation Cooperatives" for identification of large-scale areas for protection from fragmentation through a "collaborative process" involving all interested stakeholders. Yet, even though this four-year effort by FWS and many stakeholders just reached its conclusion, FWS now proposes a Program that would unilaterally and preemptively remove an area of up to 1.1 million acres from consideration under the Advisory Committee's guidelines, thereby disregarding the carefully formulated, elaborate tiered review process before it has even been considered by the Secretary of the Interior. In fact, the EA – issued on April 15, 2010, more than a month *after* the release of the Advisory Committee report – fails to even mention the existence of the report or the extensive public debate on these issues that led to the formation of the Advisory Committee and its assignment to consider both the interests of habitat protection and wind energy development. Therefore, AWEA and the Wind Coalition urge the FWS to consider revising the EA, both to take the report's directly relevant analysis and conclusions into account, and to be consistent with the Secretary's forthcoming decision on adoption of the guidelines that is expected shortly. **Comment 3 – Failure to prepare an EIS.** Should FWS proceed with carving out such a large region wholesale from wind energy development, thus rejecting the Advisory Committee's case-by-case approach, an Environmental Impact Statement ("EIS") and not 3	"[The] scale and biotic nature of habitat requirements, ranges and habitats are highly congruent with the nation's richest inland wind resources, known impacts of anthropogenic features (tall buildings, structures, energy facilities, roads, etc.)" (Wind Turbine Advisory Committee Draft, USFWS 2010). Text on page 26 of the draft EA has been revised to include Service Interim Guidance on Avoiding and Minimizing Wildlife Impacts from Wind Turbines (USFWS 2003) which recommends avoiding "placing turbines in habitat known to be occupied by prairie grouse or other species that exhibit extreme avoidance of vertical features and/or structural habitat fragmentation. In known prairie grouse habitat, avoid placing turbines within 5 miles of known leks (communal pair formation grounds)." While wind turbines may be compatible with some wildlife species in other areas of Kansas, the Flint Hills tallgrass prairie-dependent species have demonstrated sensitivity to vertical structures and habitat fragmentation. The US Fish and Wildlife Service will continue to work collaboratively with individuals, nongovernment organizations, federal, state, and local agencies on a variety of issues, including renewable energy development. The Service has initiated a program using LCCs as a means of addressing conservation and climate change challenges through partnership opportunities (see page 35 of the final EA). Although all of the LCCs have not been formally initiated yet, the FHLCA will be an active partner in the Eastern Tallgrass and Big Rivers LCC. **Response 27.3.** After receiving largely supportive comments and input from public scoping meetings and discussions with a number of organizations, state, and federal agencies, the Service determined that the appropriate National Environmental Protection Agency (NEPA) document to prepare for the FHLCA project was an EA. Significant controversy has been defined as "circumstances where a substantial dispute exists as to the environmental consequences of the proposed action and does not refer to the existence of opposition to a proposed action, the effect of which is relatively undisputed" (43 CFR 73 page 61299). The FHLCA project will utilize voluntary conservation easements that would be acquired from willing sellers only. Landowners could continue to pursue energy development on their land without Service conservation easements. The easement program would to a large extent maintain the existing conditions for landowners and the general public, and will not significantly affect the quality of the

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	an EA is the appropriate document for the NEPA evaluation. Agencies proposing "major federal actions" must take a "hard look" at their environmental impacts to inform both the public and decision-makers of the consequences of proceeding with a proposed major action. FWS's own NEPA procedures provide that an EIS, not an EA, is required for: major proposals establishing new refuge system units, fish hatcheries, or major additions to existing installations, which involve substantive conflicts over existing State and local land use [or] significant controversy over the environmental effects of the proposal. . . U.S. Department of the Interior, Departmental Manual, Part 516, Chapter 8: Managing the NEPA Process – U.S. Fish and Wildlife Service, section 8.7. While the FHLCA may not be a refuge, its 3.3 million acre scope is larger than any actual refuge in the continental United States, and only one refuge outside Alaska is larger than the 1.1 million acres to be placed under conservation easement (*see* http://en.wikipedia.org/wiki/List_of_largest_National_Wildlife_Refuges). The purported conflict between habitat protection and wind development, as well as the potential impacts on wind energy and resulting indirect impacts on climate change and the environment (discussed in more detail below), are clearly matters of substantial conflict over land use. Thus, the Program is clearly a major federal action requiring a full EIS.	human environment, and will not have a close causal connection to a change in the physical environment (40 CFR 1508.27). Under DOI Departmental Manual 516 DM 8.6, Actions Normally Requiring an EA include proposals to establish most new refuges and fish hatcheries; and most additions and rehabilitations to existing installations. U.S. Department of Interior, Departmental Manual, Part 51, Chapter 8.7B: "If, for any of the above proposals it is initially determined that the proposal is not a major federal action significantly affecting the quality of the human environment, an EA will be prepared and handled in accordance with 40 CFR 1501.4(e)(2). If the EA subsequently indicates the proposed action will cause significant impacts, an EIS will be prepared." The FHLCA project is one of the larger units of the refuge system in the continental United States, but there are several larger management areas in the continental United States. For accurate information on national wildlife refuge lands see the Service website (http://www.fws.gov/refuges/land/LandReport.html).
27.4	**Comment 4 – Unsupported presumption of wind energy incompatibility with prescribed burning.** The EA summarily dismisses wind energy development and habitat protection as incompatible primarily for two reasons: purported constraints on maintaining tallgrass prairie by prescribed burning, and visual or barrier impacts causing prairie chickens and other bird species to avoid the area, resulting in fragmentation of their habitat (EA, pp. 5, 22-24). On the first issue, the EA cites no evidentiary support for its claim that "[i]ncreased wind energy development would limit prescribed burn activities" (p. 27). In fact, this claim is not correct. Wind energy developers do not ask that landowners refrain from their current practices of agricultural burning and, currently, wind farms exist on lands that utilized prescribed burning without conflict. Other habitat preservation measures, such as prevention of tree encroachment and exclusion of invasive species, can also be carried out by landowners, wind project operators or others with no impacts on wind operations. We note that the Tallgrass Legacy Alliance ("TLA"), for which FWS serves as an Advisor, compiled a Top Five List of threats to the tallgrass regions in Kansas (*see* http://www.fws.gov/mountain-prairie/pfw/kansas/ks7.htm). Wind energy development was not included on that list, but certain land management practices were. Specifically, agricultural impacts (*i.e.*, cattle ranching) were cited as two of the top five threats to tallgrass habitat in Kansas. Nevertheless, the EA fails to consider the threats posed by such incompatible land management practices and instead focuses on other perceived threats, such as wind energy development.	**Response 27.4.** Pages 23–26 of the final EA contain general language on fragmentation and the increased difficulty of conducting prescribed fire, which is necessary to limit tree encroachment, when the level of infrastructure development is increased. The text will be changed in the final EA to say that fragmentation from wind energy infrastructure "could make prescribed fire more difficult to implement" instead of "would limit". Although wind energy developers may not ask landowners to refrain from burning, the logistics and feasibility of burning around structures and roads makes prescribed fire more difficult (see page 25 of the final EA). The Tallgrass Legacy Alliance information on the Partners for Fish and Wildlife webpage lists fragmentation as the number two threat to tallgrass prairie. As is described in the EA, fragmentation of prairie habitat for grassland-dependent wildlife can result from a number of sources, including wind energy infrastructure.
27.5	**Comment 5 – Unsupported presumption of wind energy incompatibility with bird habitat.** Regarding fragmentation of habitat or reduced amounts of habitat for greater 4	The FHLCA is a voluntary participation program for landowners. Energy and infrastructure development would only be restricted on the parcels offered by willing sellers that are accepted by the Service as an appropriate conservation easement purchase. Landowners could continue to pursue energy development on their land without Service conservation easements.

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27.6	prairie-chickens and other grassland bird species, the Advisory Committee report thoroughly reviewed the most current research on this issue and, as noted above, recommended a multi-tiered evaluation process for appropriate siting decisions, not a categorical ban on wind energy over large areas. AWEA and the Wind Coalition encourage FWS to take into account the Advisory Committee's conclusions as well as all of the current research (not only the limited studies cited in the EA), in a full EIS evaluation. We also note that a categorical ban on this basis is inconsistent with FWS's own 2003 Interim Guidance on Avoiding or Minimizing Impacts from Wind Turbines ("Interim Guidance"). Appendix 6 and Attachment 2 of that document (Interim Guidance, pp. 40-44) evaluated then-available research for the express purpose of providing "guidance for considering compatibility determinations" and concluded that "current biological information" indicated that a low density of wind turbines "would not have any significant impact to grassland habitat and its value to migrating birds or other wildlife" (Interim Guidance, p. 40). By incorporating best practices and mitigation measures, such as siting facilities close to existing roads or on the edges of grassland tracts and incorporating buffer zones, FWS concluded that wind energy construction and maintenance could be accomplished "in such a manner as to minimize the destruction or alteration of habitat" (*id.*). FWS took a similar approach in its November 2005 Biological Opinion for the Bureau of Land Management ("BLM") Wind Energy Development Program covering nine western states. In that analysis, FWS found that best management practices and mitigation measures were sufficient to conclude that the BLM program would not likely adversely affect nine target species, critical habitat or additional listed species (which included gallinaceous birds) (Biological Opinion, p. 2). AWEA and the Wind Coalition acknowledge that wind energy development may, under some circumstances, impact birds and wildlife. However, the EA does not perform any evaluation to identify such instances and the ways to mitigate them, such as considering a range of development density alternatives or other mitigation measures. That is precisely the sort of analysis of impacts, alternatives, and mitigation that a NEPA document should contain. Instead, the EA conclusively presumes an unmitigable, categorical incompatibility, and, therefore, the Program imposes a blanket prohibition of any wind development in all easement lands. NEPA requires a complete evaluation of all readily available information and a weighing of competing evidence, especially when the information is readily available to FWS from its own 2003 evaluation and 2005 Biological Opinion and its lead role in the 2007-2010 Advisory Committee process. In contrast, the EA's summary presumptions do not provide such an evaluation, and fail to present the informed decision-making prescribed by NEPA. **Comment 6 – Failure to consider impacts of precluding wind energy.** In a mere two sentences within the discussion of biological effects of the No Action Alternative, the EA briefly recognizes the "high potential for wind development in the region" and that "[w]ind power offers an emission-free source of electricity and lacks many of the 5	The decision to not allow wind energy structures on conservation easements in the FHLCA was based on available research that indicates while wind turbines may be compatible with some wildlife species in other areas, the Flint Hills tallgrass prairie dependent species have demonstrated sensitivity to vertical structures and habitat fragmentation. **Response 27.5.** See the responses to comments 27.1 and 27.2. The Fish and Wildlife supports U.S. Department of Interior policy on renewable energy development, including Secretarial Orders 3285 and 3289. However, the strategies contained in these Secretarial Orders are to be addressed for appropriate areas on public lands and the outer continental shelf. The FHLCA project would be administered as part of the Refuge System in accordance with the National Wildlife Refuge System Administration Act of 1966 and other relevant legislation, executive orders, regulations, and policies (see page 6 of the final EA). A significant directive of the Refuge Administration Act is to ensure that the U.S. Fish and Wildlife Service maintains the biological integrity, diversity, and environmental health of the National Wildlife Refuge System for present and future generations of Americans. Fragmentation of the National Wildlife Refuge System's wildlife habitats is a direct threat to the integrity of the National Wildlife Refuge System, both today and in the decades ahead. Uses that the Service reasonably anticipates may reduce the quality or quantity or fragment habitats on a national wildlife refuge would not be consistent with Service policy. The FHLCA project would use voluntary conservation easements that would be acquired from willing sellers only. Landowners could continue to pursue energy development on their land without Service conservation easements. The easement program would to a large extent maintain the existing conditions for landowners and the general public, and will not significantly affect the quality of the human environment, and will not have a close causal connection to a change in the physical environment (40 CFR 1508.27). Although wind energy development is not inherently compatible, or incompatible, with wildlife and habitat protection, an assessment needs to be made based on the requirements of the species involved. Available studies indicate tall vertical structures fragment large tracts of otherwise appropriate habitat, making it unsuitable for interior grassland species such as greater prairie-chicken in Kansas. A number of authors have addressed the fragmentation effects of infrastructure on prairie grouse (Kuvlesky et al. 2007,

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27.7	environmental hazards associated with fossil fuels" (EA, pp. 22-23). The EA then ignores these benefits and instead stresses that wind energy represents a risk for the Flint Hills area such that "economically viable wind resource areas and conservation priority areas show a high level of geographic congruence" (EA, p. 23). The EA somewhat indirectly acknowledges the positive socioeconomic impacts to landowners from wind energy development, finding that under the No Action alternative they could obtain revenue from wind development, while under the Proposed Action alternative they would receive "some financial compensation" by selling easements (EA, p. 27-28). Moreover, for a program whose intent appears to be to categorically exclude wind energy development from a large area, the EA contains no section on impacts to "energy resources" at all, and concludes that the Proposed Action alternative will have no direct or indirect unavoidable adverse impacts to the environment (EA, p 28). In addition, despite the EA's detailed discussion of climate change effects on the Flint Hills habitat (EA, pp. 11-12), and inclusion of buffering against climate change in the Program's purpose and need (EA, p. 6), the EA makes no mention of the benefits of wind energy in the context of climate change and its ability to avoid the conservation challenges posed by climate change through the avoidance of its cause: greenhouse gases. The NEPA analysis should have considered whether adverse environmental impacts could result from precluding wind energy development in easement lands. In general, wind generation results in greatly reduced land disturbance compared to other energy sources, including solar energy; does not produce air pollutant or greenhouse gas emissions from generating operations and produces only minor emissions from construction and maintenance activities; and involves far less water use and waste generation. *See, e.g.*, BLM, Final Programmatic Environmental Impact Statement on Wind Energy Development on BLM-Administered Lands in the Western United States (2005), pp. 6-21 to 6-25. For these reasons, among others, increased wind generation is a key component of the country's strategic efforts to shift to more renewable energy resources and address climate change. Achieving the environmental benefits of developing the nation's renewable energy resources and preserving valuable habitat is usually compatible. In the rare instance in which those goals are not, an agency should take a "hard look" at how, if possible, to reconcile these goals. Congress adopted NEPA to ensure that federal agencies undertook such a hard look before making decisions. In this case, the EA did not take the requisite hard look to support a decision to forego all prospects of wind energy development in the FHLCA, precluding even the possibility of case-by-case consideration as provided in the Advisory Committee guidelines. NEPA, of course, does not bar FWS from making such a decision, but it does require the decision to be fully informed before doing so. AWEA and the Wind Coalition believe that the EA's failure to engage in that type of informed decision-making is inconsistent with the precepts of the NEPA process. **Comment 7 – Failure to provide a balanced analysis.** The EA addresses none of the above issues and, therefore, does not achieve the goals of a fully informed NEPA document. Instead, it appears to display a uniformed bias against wind energy development rather than the balanced assessment and disclosure required by NEPA. For 6	McDonald et al. 2009, Giesen 1994, Fuhlendorf et al. 2002, Robel 2002). See additional specific information on ecological impacts and responses of fragmentation pages 23–26 of the final EA. The statement that current biological information "indicated that a low density of wind turbines would not have any significant impact to grassland habitat and its value to migrating birds or other wildlife" is not made in the Interim Guidance, page 40. It is stated that "information available at this time indicates that turbine densities at this level will not materially interfere with or detract from the purposes of the easement (Attachment 2). The species list referred to in Appendix 6, Attachment 2 is for North and South Dakota, and largely for different bird species than the priority species guild for the tallgrass prairie habitat of FHLCA. The Service examines species habitat requirements for each particular area. The Bureau of Land Management 2005 Biological Opinion does not cover the state of Kansas, or the wildlife and habitat resources that wind energy development would affect in the Flint Hills. Additionally, BLM has a "multiple use" mission including the development of minerals and energy production, which is a different focus from the Service's "wildlife first" mission. See the response to comment 27.1. Also, see the response to comment 27.4. **Response 27.6.** Although the Service supports renewable energy development, the EA analyzes the impact from fragmentation on the trust resources in general, and it is not within the scope of the project to provide an analysis of the impact of all forms of energy development. It is also beyond the scope of this project to incorporate a discussion of all national policies, energy programs, recommendations, and initiatives. See also the response to comment 27.4. It is not within the scope of this project to determine how much energy can or would be generated by the development of wind, oil and gas, or any other type of energy within the FHLCA. The energy, and any revenues generated, will be determined by the number of landowners willing to sell the development rights on their non-easement property. The FHLCA project will utilize voluntary conservation easements that would be acquired from willing sellers only. Landowners could continue to pursue energy development on their land without Service conservation easements. The easement program would to a large extent maintain the existing conditions for landowners and

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	instance, the EA explains at length that the No Action alternative will result in environmental consequences from allowing wind energy development, but ignores the fact that the Proposed Action alternative would also result in environmental consequences from precluding wind energy development in the same area. NEPA documents are not meant to provide such a one-sided analysis. The Council on Environmental Quality ("CEQ") regulations requires NEPA documents to consider "indirect effects" that are "caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable." 40 C.F.R. § 1508.8(b). Notwithstanding the EA's assertion of no indirect impacts (EA, p. 28), precluding wind energy from all of the 1.1 million acres of area (which has high development potential for wind energy) is a reasonably foreseeable – in fact, an intended – result of the Program that will have effects that should have been considered in more detail. If wind development is not too speculative to be part of the EA's purpose and need and be addressed in an analysis of impacts in the No Project alternative, then it is also not too speculative to be included in analysis of impacts from the Proposed Action alternative.	the general public, and will not significantly affect the quality of the human environment, and will not have a close causal connection to a change in the physical environment (40 CFR 1508.27). Although the Service supports renewable energy development, it is beyond the scope of this project to incorporate a discussion of all national policies, energy programs, recommendations, and initiatives. Through the FHLCA project the Service seeks to conserve part of remaining 4% of relatively intact tallgrass prairie habitat, thereby providing more system resiliency in a changing climate by maintaining a migration corridor for migratory grassland birds, and also by providing carbon sequestration benefits (page 27 of the final EA).
27.8	**Comment 8 – Unsupported claim regarding wind development redistribution.** In lieu of analyzing adverse impacts resulting from preclusion of wind projects, the EA (p. 26) asserts that "the proposed action would affect the location and distribution, but not rate or density, of wind energy infrastructure development." There is no further discussion beyond this sentence and no evidentiary support is cited for that claim. This claim is inaccurate for several reasons. First, the 1.1 million acre area to be covered by easements is simply too large to reasonably expect that projects can be readily relocated, with no effect whatsoever on the progress of wind development in the region. Second, the proposed conservation area embodies a large north-south swath of the state. Since power transmission lines would be prohibited on easement lands, wind generation projects would have difficulty relocating to the west while still reaching the primary electricity markets to the east. Finally, as the EA acknowledges, FWS and conservation groups are planning further habitat protection initiatives in the region in the future, which will limit relocation opportunities for wind projects (*see* comment below regarding cumulative impacts).	The statement that "developing renewable resources and preserving valuable habitat is usually compatible" needs to be assessed with specific information on the species potentially affected. **Response 27.7.** The Service respectfully disagrees with the assessment that it is biased against wind, or other forms of energy development. On properties where wind, oil and gas, or mineral rights have already been sold (severed from the estate), the Service will work with landowners and developers to minimize any negative impacts of development and extraction activities (50 CFR 25.11). On land where the rights for wind, oil and gas, or mineral development have not been sold (estate is still intact), conservation easements would require nonsurface occupancy (off-site development) for any future development activities. The Service would consider development of energy and mineral resources on the easement properties, if they can be implemented without disturbing the surface or creating vertical barriers, which would fragment the grassland habitat for wildlife.
27.9	**Comment 9 – Inadequate project description.** Another problem with the NEPA evaluation is that neither the EA nor the LPP actually discloses the proposed conservation easement terms. All that is stated, in a single sentence, is that the "conservation easements would not permit commercial and industrial-scale development of wind energy" and other forms of development (EA, p. 24). Given that the whole action consists of a program to place easements on properties within the conservation area, more detailed information on what terms the easements will contain is essential. In other words, in NEPA terminology, there is no adequate project description. The LPP (p. 4) states that easements will use "similar language and terms" compared to those of FWS's "standard conservation easement agreements" – although, again, the standard agreement terms are not disclosed. However, the standard terms apparently do not, in fact, prohibit wind energy development. On the contrary, FWS's 2003 Interim	The easement program would to a large extent maintain existing conditions for landowners and the general public, will not significantly affect the quality of the human environment, and will not have a close causal connection to a change in the physical environment (40 CFR 1508.27). In effect, the conditions and consequences of precluding wind energy are currently being realized. **Response 27.8.** The language has been revised in the final EA to provide clarification (see page 28 of the final EA).

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	Guidance, Appendix 6 (p. 41), states that FWS managers may "negotiate with the energy company and the easement landowner to allow wind development consistent with the purposes of the conservation easements" and that low-density "development [may be] found to be compatible with easement purposes." Accordingly, it is not clear how "similar language" to the standard form language would categorically prohibit wind development. In sum, the lack of a clear description of the easement terms leaves decision-makers and the public with no clear understanding of the restrictions that would be placed on easement lands and their consequences.	There is no expectation of relocation of any infrastructure covered by permits or leases that are already in place. Additionally, there is an established transmission grid in Kansas already (see the map at http://kec.kansas.gov/chart_book/Chapter6/02_KSWindEnergyElectricTransMap.pdf)
27.10	**Comment 10 – Failure to analyze reasonable alternatives.** It has been often stated that the "alternatives analysis is the heart of NEPA." The EA considers only two alternatives, the No Action alternative and the Proposed Action for acquiring conservations easements to preclude wind energy development on up to 1.1 million acres (EA, p. 24). Given the need to promote the interests of habitat protection and clean, renewable energy, the EA should have considered at least two other reasonable alternatives that might better satisfy both goals: (1) *Reduced Scope Alternative*, with a smaller acreage placed under conservation easements. This alternative would allow some portions of the Flint Hills area to be open for possible wind energy development, if determined appropriate under the case-by-case analysis recommended by the Advisory Committee; and (2) *Balanced Use Alternative*, with less restrictive easement terms that would restrict residential and other forms of habitat-fragmenting development on the full 1.1 million acres, but would allow for the possibility of wind energy development, again where appropriate under the case-by-case analysis recommended by the Advisory Committee. Both alternatives should be fairly evaluated in an EIS. Moreover, FWS itself recognized in the 2003 Interim Guidance, Appendix 6, that landowners who anticipate greater income from wind generation than from selling easements may not agree to voluntarily place their property under easements. As the Interim Guidance (p. 42) notes, "In this respect, the future success of the easement program could be compromised if these restrictions are unnecessary." In other words, FWS's own goals of habitat protection under the Program could be seriously undercut by the blanket exclusion of wind development, failing to allow any projects even in areas that, upon careful evaluation, could be found to compatibly support both wind energy and habitat protection. This point lends further support to the need to evaluate alternative (2), above, with less restrictive easement terms.	**Response 27.9.** The easement document is not a required NEPA component of the EA, and is not a description of a project. The possible terms, conditions, and requirements of Service conservation easements in general and specific issues for the FHLCA were discussed extensively in all of the public meetings. As is with other Service easements, and other conservation organization easements in the Flint Hills, the FHLCA easements will contain restrictions on development (residential and commercial structures), and will be in perpetuity. The final easement document developed by the Realty Division will incorporate the requirements and biological needs of the trust wildlife resources in the FHLCA, with what landowners have indicated through comments at meetings and letters will be acceptable to them. Most of the comments the Service received related to wind energy expressed support for the exclusion of commercial development in the Flint Hills. **Response 27.10.** The decision of whether to establish a new unit Conservation Area of the National Wildlife Refuge System is a decision of whether to proceed with establishment, or not. Thus, typically, Conservation Area LPPs typically involve two alternatives, a no action (non-acquisition alternative), or an acquisition option that will establish a new unit of the National Wildlife Refuge System. The text of the draft EA has been revised to reflect the additional alternatives that were considered, but not studied further, such as fee-title acquisition, or an option considering a much larger, or smaller, project boundary.
27.11	**Comment 11 – Inadequate cumulative impacts analysis.** The EA (p. 29) also cursorily dismisses the issue of significant cumulative impacts. As the EA (p. 2) notes, the FHLCA is part of a larger "landscape-scale, strategic habitat conservation effort." While the immediate goal is to place up to 1.1 million acres under conservation easements, representing 1/3 of the 3.3 million acre conservation area, the "long-term project goal" is to protect roughly half of the 3.3 million acre total (EA, p. 3). "Related actions and	When the decision to establish a new refuge is being made, Service policy is to acquire land only when other means, such as zoning or regulation, of achieving program conservation goals and objectives are not appropriate, available, or effective. When lands are to be acquired, the minimum interest necessary to reach management objectives is considered. If fee-title is required, full consideration will be given to extended use reservations, exchanges, or other alternatives that will lessen the impact on the landowner and the community.

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27.12	activities" acknowledged in the EA include tens of thousands of additional acres in the region, held under easement by nongovernmental conservation entities (EA. pp. 7-8). Finally, future phases of expanding the conservation area into Oklahoma are planned (EA, p. 10). NEPA requires an evaluation of the cumulative impacts of the proposed action, together with those of other, reasonably foreseeable, actions. *See* CEQ NEPA regulations, 40 C.F.R. section 1508.7. Related actions generally are included in NEPA documents for purposes of identifying cumulative impacts. However, the EA does not provide a substantive analysis of cumulative impacts, thus underestimating the combined effect of long-term plans for expanding regional land use restrictions, as well as overestimating the feasibility of relocating wind projects, as discussed above. **Comment 12 – Failure to acknowledge irreversible and irretrievable commitment of land and wind energy resources.** As required by NEPA, the EA (p. 28) considers whether there would be any "irreversible or irretrievable commitment of resources" associated with establishing the Program, and finds that no such commitment would occur. This finding is contradicted by the EA's express intent to "preclude . . . wind energy development on private land" (p. 27; *see also* p. 5) together with its statements regarding the "high potential for wind development in the region." The EA further states that the factors for prioritizing areas for the purchase of conservation easements within the conservation area would be based on the biological needs of species of concern, the threat of development, connectivity with other protected lands and quality of prairie habitat (EA, p. 9; *see also* LPP , pp. 5-6 (identifying priority areas)). Accordingly, the consideration of potential wind energy development is not even to be considered when selecting properties for easements in perpetuity, within the boundaries of the FHLCA. AWEA and the Wind Coalition believe that placing up to 1.1 million acres of private lands under restrictive easements, which do not allow for wind energy development for perpetuity, constitutes an irreversible or irretrievable commitment of resources. In failing to acknowledge this commitment to the public and decision-makers, the EA is inadequate as an informational document that is consistent with NEPA principles.	A rationale of why the Service has decided to use conservation easements to achieve its conservation purposes for the FHLCA project instead of other alternative is given under the "Alternatives Considered but not Studied" section on page 10 of the final EA. The analysis and information provided throughout the EA led to the definition of the project approved acquisition boundary and the maximum acreage to be acquired by the Service for the FHLCA. Some of the factors considered in the EA include the narrowness of the intact prairie habitat in the north-south migration corridor, the rapid encroachment by trees, residential, and commercial development. The project acquisition acreage represents less than 1% of the physiographic boundary of the historic range of tallgrass prairie and only 2% of the potential wind energy development in Kansas. Less than 4% of intact tallgrass habitat remains in North America, the majority of which is located in the Flint Hills of Kansas. To adequately maintain the grassland bird migration corridor, genetic viability of the greater prairie-chicken, the minimum goal is the conservation of what amounts to less than 1% of the remaining tallgrass prairie, when fully appropriated. A 'balanced use approach" that would allow wind infrastructure only, while excluding other types of development would still fragment grassland habitat and would not be appropriate for this project. **Response 27.11.** See response to comment 27.1 and 27.8.
27.13	**Comment 13 – Timing of NEPA review and decision.** Finally, we note that there is a procedural error in the statement in the EA on p. 6, under the heading "Decisions to be Made", that FWS will first "[d]etermine whether the Service should establish the Flint Hills Legacy Conservation Area" and then, "[i]f yes, determine whether the selected alternative would have a significant impact" and either make a Finding of No Significant Impact based on the EA, or prepare an EIS. On the contrary, NEPA requires an agency, using whatever form of document, to complete its analysis of environmental impacts and alternatives, including the No Action alternative – that is, the alternative of determining that FWS should *not* establish the conservation area – *before* making the decision to proceed with the action.	Several comments were received from the public on the possibility of the addition of a conservation program for the tallgrass prairie habitat located in Oklahoma. Region 2 of the Service will take into consideration the possibility of future tallgrass conservation efforts in Oklahoma. **Response 27.12.** The FHLCA project will utilize voluntary conservation easements that would be acquired from willing sellers only. Landowners could continue to pursue energy development on their land without Service conservation easements. The easement program would to a large extent maintain the existing conditions for landowners and the general public, and will not significantly affect the quality of the human environment, and will not have a close causal connection to a change in the physical environment (40 CFR 1508.27). Although it is not necessary to address "the relationship between short-term uses of man's environment and the enhancement of long-term productivity" and "irreversible or irretrievable

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27.14	Thank you for considering our comments. We look forward to working with FWS on the further refinement of its Program proposal in a manner that promotes the protection of the nation's biological resources and the use of environmentally sustainable wind energy. Sincerely, Gene Grace Senior Counsel Tom Vinson Director of Federal Regulatory Affairs American Wind Energy Association Suite 1000 1501 M St, NW Washington DC 20005 Phone: (202) 383-2521 Fax: (202) 383-2505 E-mail: ggrace@awea.org Paul Sadler Executive Director Wind Coalition 100 Congress Ave., Ste. 800 Austin, Texas 78701 Phone: (512) 651-0291 E-mail: ExecutiveDirector@Windcoalition.org 10	commitments of resources" in an EA, the text has been revised to include additional information in the "Irreversible and Irretrievable Commitments of Resources" section on page 30 of the final EA. **Response 27.13.** The first sentence under "Decisions to be Made" states that the Service planning team will complete an analysis (EA), and then based on this analysis, will proceed with the decision-making process. **Response 27.14.** Thank you for your comments.

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28		**Response 28.** Thank you for your comments.

Protect The Flint Hills

The Last Expanse of Tallgrass Prairie
5694 NW 50th
El Dorado, KS 67042

Amy Thornburg, Land Protection Planning
U.S. Fish and Wildlife Service
P.O. Box 25486, DFC
Denver, Colorado 80225

May 11, 2010

Dear Ms. Thornburg:

The purpose of this letter is to enthusiastically support the **Flint Hills Legacy Conservation Area**, as proposed by the U.S. Fish & Wildlife Service.

The North American Tallgrass Prairie is one of our most endangered ecosystems. Less than 4% of the original ecosystem remains and most of it is located in the Kansas Flint Hills. The FHLCA initiative offers a realistic plan to preserve this vanishing ecosystem while leaving the land in private hands.

Conservation easements are one of the most efficient and cost effective methods of preserving the Tallgrass Prairie for future generations of Americans. Many organizations, including The Nature Conservancy, Kansas Land Trust, USDA, Ranchland Trust of Kansas and Kansas Department of Wildlife & Parks already fund conservation easements in the Flint Hills; however, these organizations need the assistance of the USFWS if the Tallgrass habitat is to be preserved on a large landscape scale.

The U.S. Fish & Wildlife's goal of 1.1 million acres of conservation easements will, in conjunction with private landowners and land trusts, ensure that the Flint Hills Tallgrass ecosystem remains largely unfragmented.

Protect the Flint Hills is a grass roots organization of citizens who are dedicated to the conservation of the wide-open spaces of the Kansas Flint Hills, the last significant expanse of Tallgrass Prairie on the continent. We applaud the creation of the Flint Hills Legacy Conservation Area and are eager to help the United States Fish & Wildlife Service make the plan a reality.

Sincerely,

Larry R. Patton, President
Protect the Flint Hills
5694 N.W. 50th
El Dorado, Kansas 67042
620-752-3455

Comment #	Letter # 29	Response
29	The Nature Conservancy Protecting nature. Preserving life. P.O. Box 285, 114 N. Douglas, Ellsworth, KS 67439 rmanes@tnc.org, 620-388-1940 (mobile & office), 785-472-3452 (fax) May 11, 2010 Mr. Mike Rich, Coordinator Flint Hills Legacy Conservation Area U.S. Fish & Wildlife Service 315 Houston Street Manhattan, KS 66502-6191 Dear Mr. Rich:	**Response 29.1.** Thank you for your comments.
29.1	We at The Nature Conservancy of Kansas appreciate the opportunity to comment regarding the Flint Hills Legacy Conservation Area (FHLCA) environmental assessment (EA). The Nature Conservancy strongly supports the FHLCA concept, primarily because it will compliment the ongoing successful partnership work of private landowners and land trusts in the area. Conservation easements are among the most effective and cost efficient means for securing lasting, large-scale ecological integrity of the Flint Hills. This region merits the Service's full involvement, as it represents North America's only remaining landscape-level expression of tallgrass prairie. Below are specific comments regarding the EA and associated issues raised during the public meetings.	**Response 29.2.** The Service believes that these are important ranking factors and will use many of these factors in the ranking criteria for the FHLCA.
29.2	**Ranking properties for program participation:** The Service should target conservation easements within large blocks of relatively unfragmented tallgrass prairie. The Service's map depicting 95% native prairie within 10,000-acre blocks would be a good initial step or filter for prioritizing easement projects; this layer effectively identifies areas important for species that require large, unfragmented prairie landscapes, such as the American golden plover and greater prairie-chicken. Consideration should also be given to the condition of offered ranch properties (e.g., range condition, percent woody cover, presence of invasives, current land management, distinct plant/animal communities, etc.). Another ranking factor we feel is important is the analysis of landscape metrics within an approximate five-mile radius of offered property boundaries. Proximity to protected land (preserves & other easements) is also important, but we do not feel that the distance shown in the EA is appropriate (see Fig 1 of the Draft Protection Plan in the EA); proximity to protected areas within five miles is preferable, in our opinion.	**Response 29.3.** Comment noted. As new data and science become available, the information will be incorporated into the initial prioritization model and will be used to adjust the ranking criteria for potential acquisition parcels.
29.3		
29.4	**Gravel removal:** Allowing gravel removal in the easements, even with restrictions on methods, will eliminate the deductibility of bargain sale conservation easements; the IRS prohibits the deduction of conservation easements that allow surface mining of minerals and gravel, including stream gravel. We recommend that the Service use more restrictive gravel harvesting language for landowners who wish to take a tax deduction for bargain sale easements.	**Response 29.4.** Comment noted. A number of comments were received during public meetings on maintaining landowner access to gravel resources. Stream bed gravel extraction will be allowed for ranching processes. No commercial gravel extraction activities will be allowed. Stream bed gravel extractions will be subject to all local, state, and federal laws. Individual landowners will need to determine any tax implications.
29.5	**Splits and Carve outs:** We believe the Service should exclude, or "carve out", tracts of cropland, buildings, etc. that do not match the goals of the FHLCA, similar to methods used under the USDA Grassland Reserve Program (GRP) in Kansas (i.e., offered tract must consist of 90% or greater native habitat). This would allow scarce conservation dollars to be used more strategically and effectively. We also recommend that the Service allow splits that do not affect the conservation values of the protected property.	**Response 29.5.** Landowners may have some limited options for carving out portions of their property from the easement, thereby allowing other uses or future structures/building construction. The easement will only limit the construction of additional structures in areas that are not located in 'carve-out' portions of the property. The landowners will retain access control, including public recreational activities.
	Trees:	

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29.6	Prohibiting the expansion of trees on Service easements in the Flint Hills is a sound concept, but we urge you to set a percent threshold for added flexibility (e.g., no more than 10% increase).	**Response 29.6.** Tree expansion will be addressed in the easement language to include provisions for maintaining tree encroachment at no more than the current level when the easement is established.
29.7	**Herbicides:** Herbicide use was not mentioned at the public meeting, nor do we believe in the EA. Because herbicides can have such a lasting effect on the native herbaceous prairie plant community, which in turn can negatively affect wildlife, we strongly recommend the Service consider easement language that offers some protection against indiscriminant and broadcast use of herbicides. Below is language used in TNC easements in the Flint Hills, which reduces the risk to native plant communities from herbicides but also provides land management flexibility. There shall be no indiscriminant broadcast spraying of herbicides or pesticides. Herbicides and pesticides may be used by spot applications (including by gun or boom nozzles) of government-approved chemicals to control state-designated noxious weeds, invasive woody species or pest insect infestations, provided their use is designed to minimize the impact on the Conservation Values of the Protected Property. Broadcast spraying of herbicides or pesticides, including aerial applications, may be permitted with prior written approval by the Conservancy, provided that, at a minimum, the following conditions are met: (a) spot treatment is not practical because of the severity of the infestation; (b) timing of application is scheduled to minimize damage to non-target species; and (c) type of herbicide or pesticide used has the least impact to non-target species while still being effective in controlling target species. The Conservancy shall have sole discretion in granting or denying broadcast spraying of herbicides or pesticides. Herbicides and pesticides shall be used only in those amounts and with a frequency of application that reasonably constitute the minimum necessary for control and shall be used in compliance with all applicable governmental regulations.	**Response 29.7.** Herbicide use was discussed at several of the public meetings. The Service anticipates using language similar to the language used by The Nature Conservancy to address herbicide application.
29.8	In closing, I wish to reiterate TNC's strong support for the Flint Hills Legacy Conservation Area proposal. We applaud U.S. Fish & Wildlife Service leaders and staff for this visionary initiative and are eager partners in conserving the rare and rich ecology and culture of the Flint Hills. Thanks for considering these comments. Please contact me at the telephone or e-mail above, if you require additional information. Sincerely, Rob Manes Director of Conservation, TNC of Kansas Cc: Alan Pollom Brian Obermeyer Mike Rich Amy Thorton Rick Coleman Susan Olivera Mike Beam Bill Sproul	**Response 29.8.** Thank you for your comments.

Comment #	Letter # 30	Response
30	Tallgrass Legacy Alliance 868 Road 290 Americus, Kansas 66835 May 3, 2010 Mr. Michael Rich U.S. Fish and Wildlife Service PO Box 128 Hartford KS 66854 Dear Mr. Rich: Please accept this letter from the Tallgrass Legacy Alliance in support of the Flint Hills Legacy Conservation Area easement program proposed by the U.S. Fish and Wildlife Service. The Tallgrass Legacy Alliance (TLA) is a 501(c)(3) producer driven non-profit organization. Our mission is to conserve and enhance the biological, economic, and cultural well-being of the tallgrass prairie through a coalition of ranchers, agricultural and environmental organizations, and public agencies. TLA supports voluntary conservation easements as a means to permanently protect the tallgrass prairie for future generations and to help ensure the continuation of the regions ranching culture. Therefore, TLA endorses the Flint Hills Legacy Conservation Area easement program and offers any assistance we may be able to provide to ensure its success. Thank you! Sincerely yours, Harold Garner, TLA President Roger Wells, TLA Coordinator	**Response 30.** Thank you for your comments.

Comment #	Letter # 31	Response
31	KANSAS DEPARTMENT OF WILDLIFE AND PARKS Mark Parkinson, Governor J. Michael Hayden, Secretary www.kdwp.state.ks.us May 19, 2010 Mr. Michael Rich U.S. Fish and Wildlife Service PO Box 128 Hartford, KS 66854 Dear Mr. Rich: This letter serves to acknowledge the Kansas Department of Wildlife and Parks (Department) supports the Flint Hills Legacy Conservation Area (FHLCA) easement program proposed by the U.S. Fish and Wildlife Service. The mission of the Department, in part, is to conserve and enhance the wildlife and habitats of Kansas and provide the public with opportunities for the use and appreciation of these natural resources. The FHLCA easement program will contribute to achieving both parts of this mission through voluntary conservation easements with landowners in the Flint Hills, which supports a diversity of wildlife and constitutes the largest remaining tract of tallgrass prairie in the nation. The Department endorses the program and is available to assist with the development of program guidelines in a manner consistent with the state's existing priorities in the Flint Hills region and beyond. Sincerely, J. Michael Hayden, Secretary Kansas Department of Wildlife and Parks	**Response 31.** Thank you for your comments.

Comment #	Letter # 32	Response
32	KANSAS LIVESTOCK ASSOCIATION *Since 1894* May 18, 2010 Mr. Steve Guertin, Regional Director Mountain-Prairie Region US Fish and Wildlife Service 134 Union Blvd, Suite 400 Lakewood, Colorado 80228 Dear Director Guertin: The Kansas Livestock Association (KLA) has historically represented the business interests of the Flint Hills ranching community. In recent years, KLA formed a land trust to help ranchers and landowners permanently conserve working landscapes. This new land trust, called the Ranchland Trust of Kansas, was created by volunteer leaders of KLA because they feared the large intact grasslands of the Flint Hills were at risk of conversion to residential and/or commercial development. In recent years we've found several Flint Hills landowners are genuinely interested in conveying a perpetual conservation easement of their land, but only if they are compensated accordingly. We've seen incredible interest in USDA's NRCS Grassland Reserve Program, which is a conservation easement purchase program. The Flint Hills Legacy Conservation Area (FHLCA) initiative is being developed at an ideal time. There is considerable interest among landowners and the appraised values of these conservation easements appear to be significantly less than values in other grassland regions of the U.S. We appreciate the Services approach to developing the FHLCA. There have been several opportunities for stakeholders to provide comments on this proposal. KLA appreciates that this is a voluntary program and that the draft Environmental Assessment and Land Protection Plan recommends against fee title acquisition. The provisions of the conservation easement deed will be critical to landowner acceptance and participation. Please know we intend to provide continual input as this document is being developed. In the mean time, the Kansas Livestock Association is supportive of this project and wish to help make it become a reality. Sincerely, Mike Beam Sr. Vice President *6031 SW 37th Street * Topeka, KS 66614-5129 * (785) 273-5115 * Fax (785) 273-3399 * E-mail: kla@kla.org * www.kla.org*	**Response 32.** Thank you for your comments.

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