

3 Threats to and Status of Resources



Black Sampson prairie vista.

This chapter discusses the analysis conducted during the EA process, and why establishment of the FHLCA through conservation easements was the chosen alternative.

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. Intact, open landscapes are essential habitat components for the greater prairie-chicken and other grassland birds that are the priority species for conservation management in the tallgrass prairie habitat guild.

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 important 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.

Today, less than 4 percent of this once vast grassland region remains (Steinauer and Collins 1996). Cultivation, agriculture, tree encroachment, and development activities have pushed grassland-dependent wildlife species into ever-shrinking areas of tallgrass prairie. Approximately three-quarters of the remaining tallgrass prairie lie 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 partly to a declining fire culture within the agricultural communities of the region. The inner core of this region is relatively intact to date, offering potential for a sustainable rural economy, and ecosystem function and value. The remaining, highest quality, ecologically functioning stretch of 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. The narrow north-south corridor reflects the shape of the remaining intact Flint Hills tallgrass.

The tallgrass prairie that remains today is due in large part to the ranching culture of the Flint Hills region. The Service believes that the FHLCA easement program is a positive effort toward perpetual conservation of wildlife values by protecting large tracts of private lands from development and conversion of prairie grasslands that will undermine these values and fragment habitats.

In addition to fragmentation, residential and commercial development can present a substantial threat to aquatic ecosystems. Housing developments can bring run-off or septic-derived nutrient additions to streams and lakes, wetland drainage, water diversion, invasive or noxious weeds, and introduction of nonnative fish into aquatic ecosystems.

EFFECTS ON THE BIOLOGICAL ENVIRONMENT

The analysis of the chosen alternative considered the estimated effects on wildlife habitat and water and soil resources

Wildlife Habitat

Fragmentation of the landscape can result in areas that are too small or disconnected to meet the habitat needs of many area-sensitive or grassland-dependent wildlife species.

Habitat Fragmentation

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

Areas with FHLCA conservation easements will not permit commercial and industrial-scale development of wind energy, new residential developments, oil and gas developments, or commercial aggregate extraction projects on easement lands due to the serious fragmentation that occurs with these types of activities and their associated infrastructure (wind towers, roads, and transmission lines). Perpetual conservation easements will 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 will support management activities such as prescribed fire, grazing, and efforts to control the spread of woody vegetation and invasive weeds. Retaining

large, unfragmented areas will also greatly reduce the 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) will be greatly reduced in the project area.

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 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.

Agricultural practices such as livestock grazing, prescribed burning, and haying will continue, while sod busting (breaking of native grassland) will be prohibited. Easements will 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 easements will be senior to any subsurface interests later acquired by a developer. Since development of the mineral estate could significantly impact the resources to be protected, the Service will require a developer to access minerals from off-site. Surface occupancy of the easement for mineral development will be prohibited.

In many places where the subsurface estate has been severed, including along the Flint Hills ecosystem, the landowner does not own the subsurface rights; and this means that the easement that the Service acquires from the landowner is subject to those outstanding mineral rights. In those cases, the Service will work on a voluntary basis with the developer to minimize surface degradation and will 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 group of all of North American bird guilds. Intact, open landscapes are essential habitat components for the greater prairie-chicken and other grassland birds that are the priority 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 will provide for the conservation of up to 1,100,000 acres of important tallgrass habitat on private land. This program will help maintain the intactness of the Flint Hills tallgrass prairie region and complement conservation efforts of RTK, TLA, KLT, TNC, KDWP, and other federal and state agencies.

Other Fragmentation Issues

Conservation easements within the Flint Hills Legacy Conservation Area will 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 will be maintained. The conservation of large, unfragmented blocks of tallgrass prairie will allow the continued use of prescribed fire to maintain healthy habitat. In particular, patch or rotation burning of prairie 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 will be maintained through objective, voluntary management.

Priority, Threatened, and Endangered Species

Grassland birds all require relatively large blocks of healthy tallgrass prairie at various ecological stages of succession for 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



Red cedar invasion of prairie.

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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.

Protection of this tallgrass landscape is essential to sustaining two federally listed 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 ecoregion (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 will 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 an approximately 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.

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 B, which includes the federally listed animals documented as occurring in the project area.

Water and Soil Resources

Water resources on 1,100,000 acres will be protected from increased nonpoint source pollution from residential subdivision, commercial development, increased erosion, and draining of wetlands, all of which are prohibited under the easement program. Compatible agricultural practices such as livestock grazing or haying will continue, while sod busting will be prohibited. The landowner will 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 (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 CO₂ concentrations (Williams et al. 2004). Therefore, conservation of the Flint Hills grasslands will not only ensure the storage of existing soil CO₂, but also provide a place for future sequestration if atmospheric CO₂ concentrations increase. Some studies have indicated under conditions of elevated levels of CO₂, carbon is stored in greater proportions below the ground 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

The analysis of the chosen alternative considered landownership and land use, the value of intact ecosystems, oil and gas explorations and development, wind energy, and public use effects on the socioeconomic environment.

Landownership and Land Use

The easement program will 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 sixty-six million Americans participating in wildlife viewing (Southwick Associates, Inc. 2007).

Easements will 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 will not be affected. Ongoing, traditional agricultural uses such as livestock grazing will allow ranching to continue on easements. This alternative will 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 will not result in a transfer of land title, and private landowners will continue to pay property taxes. 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).

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 will 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 will not be

provided in areas that have undergone residential or commercial development.

The easement program will 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

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

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

Development

The easement program 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 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 will allow ranching to continue. Open space will be maintained on a large landscape scale, thereby preserving the rural lifestyle of the area.

Oil and Gas Exploration and Development

The program will 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 will 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 will require a developer to access minerals from off-site. Surface occupancy of the easement for mineral development will be prohibited.

Wind Energy Development

The easement program will 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) will still be available for development.

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

Under the program, the Flint Hills grasslands will 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 program will help protect valuable ecosystem services as shown in figure 4. Furthermore, it will prevent the prohibitively high cost of restoration.

UNAVOIDABLE ADVERSE IMPACTS

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

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

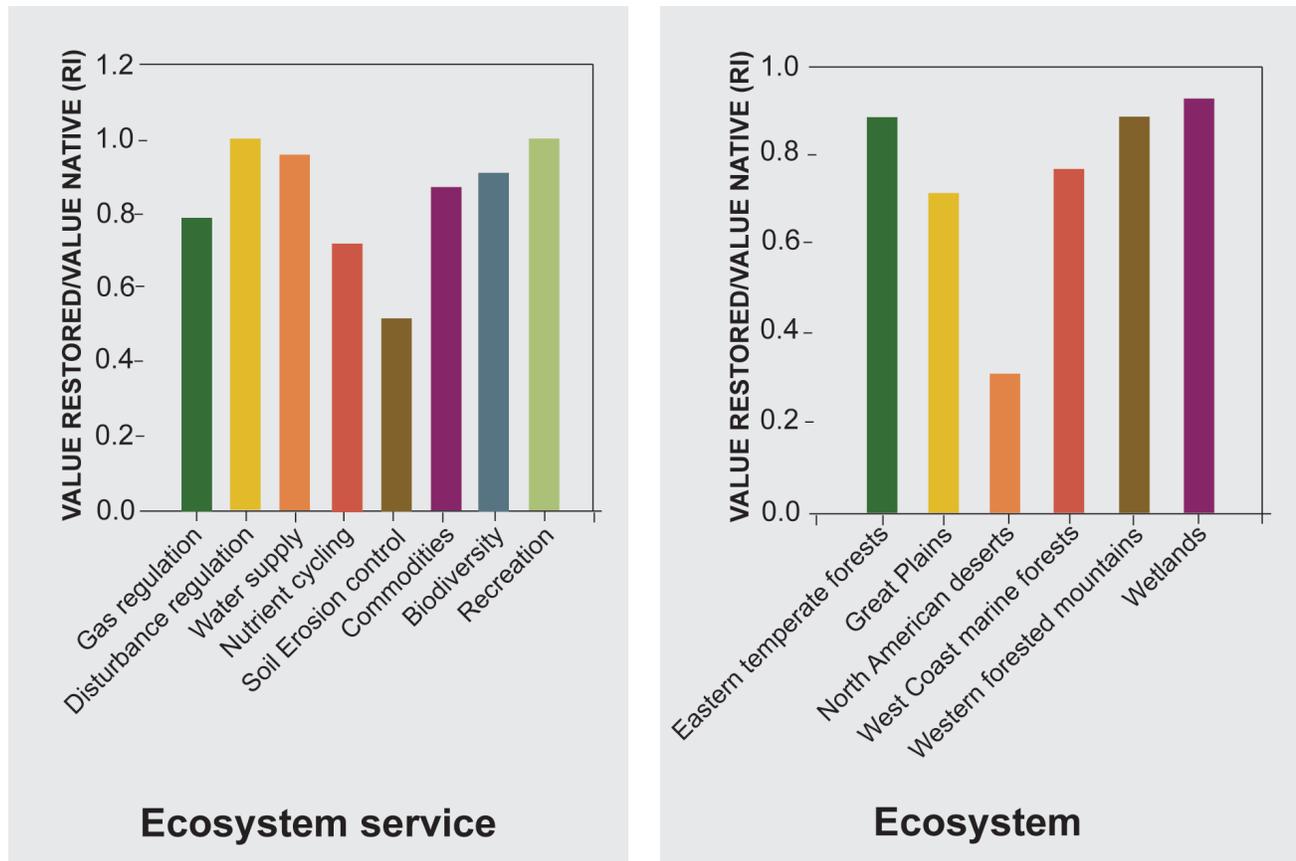
There will not be any irreversible or irretrievable commitments of resources associated with the

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) will exist.

The introduction of new residential and commercial infrastructure to the Flint Hills tallgrass prairie will 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 will 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.

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



Note: 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)

SHORT-TERM USE VERSUS LONG-TERM PRODUCTIVITY

The conservation easement program will 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 will gain the protection of tallgrass prairie species for future generations of Americans. The public will gain long-term opportunities for wildlife dependent recreational activities.

CUMULATIVE IMPACTS

Cumulative impacts are defined by National Environmental Policy Act (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 the easement program, 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 GRP, 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 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 program but could result in cumulative or additive effects when combined with the easement program. 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 (NREL 2010). Second only to Nebraska, Kansas has extremely high wind energy potential with 47.1 million acres 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 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 will 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 Marias des Cynes National Wildlife Refuge 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

The program 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

Through the proposed easement program, up to 1,100,000 acres of privately owned native tallgrass prairie habitats will be added to the 31,000 acres within the project area that already have some level of protection. This will 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.

