

Send comments to: greatplainscomments@fws.gov

Name of Emphasis Area: Great Plains (GPEA)

Title of the Key Conservation Priority: Conservation and Restoration of Native Short and Mixed-grass Prairie and Grassland Ecosystems

Description of the Key Conservation Priority:

The Great Plains Emphasis Area was historically dominated by short and mixed-grass (mid-grass) prairies, which support a variety of resident, endemic, and migratory species. Many of these species are declining in distribution and abundance due to habitat loss and fragmentation; some, such as the federally threatened lesser prairie-chicken (LEPC), have declined dramatically in the last few decades. Initial conversion of these native prairies to agricultural production significantly altered the landscape (Knopf and Samson 1995). Although some former cropland has been converted back to native grasslands, such as under the Conservation Reserve Program (CRP), these native grasslands often lack specific components, such as shrubs or forbs, typically present in native prairies. Increased development and resulting fragmentation of the remaining prairie/grassland parcels are exacting a significant toll on the short and mixed-grass prairie ecosystems. Fragmentation, the reduction and size and connectivity of remaining parcels of grassland habitats, has likely had more severe ecological consequences for flora and fauna of the Great Plains than did plowing for cultivation of grains (Knopf and Samson 1995). Native prairies/grasslands in the southern Great Plains are subject to a wide variety of threats including energy development (oil and gas, wind and transmission), improper grazing, climate change, highway expansion, housing development, conversion to agriculture, and invasive woody species encroachment from lack of fire, all of which contribute to habitat loss and fragmentation of existing intact prairie/grassland parcels. Conservation and restoration efforts can be targeted to reduce fragmentation of prairie/grassland habitats, improve habitat connectivity for prairie species, and maintain or increase the size of remaining intact prairie/grassland parcels.

Why is this a high priority for the Service in the Great Plains?

Fragmentation is particularly important to sensitive species that require large expanses of intact prairie landscapes to complete their life cycles. Species such as the threatened lesser prairie-chicken and the Sprague's pipit typically have relatively large minimum area requirements and require varying degrees of expansive, intact grasslands to support their life history needs. Fragmentation can significantly reduce habitat quality for area sensitive species. The Great Plains also provide conditions that are highly favorable to development of wind energy. The implications of wind energy development are particularly relevant as it is expanding rapidly and is largely unregulated. Efforts being promoted by the Service and its partners can help direct development away from prime habitats, reducing their impacts.

The anticipated effects of climate change, particularly altered precipitation patterns that lead to drought, are also expected to contribute to further degradation of conditions within native prairies, not only exacerbating the effects of human development but likely causing a northward shift in suitable habitat conditions. Plant populations in the prairies, particularly the mixed-grass prairie, fluctuate dramatically in response to climatic variables like precipitation. Historically episodes of drought occurred within these prairies every 10 to 20 years or so and little can be done to ameliorate such conditions. Under some climate change scenarios, the frequency and severity of drought are expected to increase.

What are the most important relevant FWS Trust Resources and programmatic responsibilities?

Trust resources: Development of prairies and native grasslands impacts many of the Service’s wildlife trust species, such as migratory grassland birds and federally-listed species that depend on these habitats. Many resident non-game species of primary management importance to the States are also impacted by the changes in the quality, patch size and connectivity within these prairie ecosystems. Some typical federal trust species include the LEPC, Cassin’s sparrow, Sprague’s pipit, mountain plover, snowy plover, upland sandpiper, and whooping crane. The black-tailed prairie dog, a keystone species of management importance to the States, directly influences habitat conditions for a variety of prairie/grassland species. A number of these federal and state trust species are in a state of significant decline and won’t recover in the absence of targeted conservation.

Programmatic responsibilities:

Migratory birds and Ecological Services have primary responsibility for migratory birds and listed species that use prairie habitats. Specifically, the Service has a responsibility to protect federal trust species and achieve functional landscapes capable of supporting self-sustaining fish, wildlife, and plant populations.

How does it support the Emphasis Area approach?

Native prairies and grasslands are representative of this emphasis area and have been severely altered by agricultural development across the Great Plains. Because the vast majority of the GPEA is under private ownership, no one entity is capable of influencing conservation in a meaningful, targeted fashion. A cross-program approach that also includes non-Service partners and stakeholders will be required if conservation efforts are to be effective. Reducing fragmentation and increasing size and connectivity of grasslands is inherently a landscape-scale problem, and one that requires coordination across the landscape and across the Service to solve.

Conservation Goals:

The Service’s desired conservation outcome is sustainable populations of trust species. This outcome is achieved in prairie/grassland ecosystems by maximizing the quality and connectivity of our landscapes. The primary goal is to restore ecological processes and to reduce fragmentation of existing intact prairie parcels. Our goals are to work across programs and with partners to:

1. Develop Landscape Conservation Design (LCD) projects to identify locations of the landscape where conservation and restoration efforts most contribute to the size and connectivity of existing prairie/grassland parcels. An important first step of this process is to ensure existing land cover data sets are accurate and current.
2. Restore connectivity among existing parcels by removing invasive woody species (mesquite and eastern red cedar) with prescribed fire and/or mechanical methods; select locations based on LCD analysis to target locations that most enhance connectivity and/or habitat quality for trust species.
3. When acquiring land for conservation, select locations based on LCD analysis to target locations that most enhance connectivity and/or habitat quality for trust species.
4. When identifying sites for restoration actions, select locations based on LCD analysis to target locations that most enhance connectivity and/or habitat quality for trust species.
5. Support research that supports management decision-making, assesses conservation effectiveness, and supports assessment of the impact of agricultural practices and proposed land developments.
6. Support existing (such as the Great Plains LCC) and develop new partnerships to extend the Service’s influence.

7. Develop a public education and outreach campaign to increase awareness and support of prairie/grassland conservation issues.

Measurable Objectives:

The Service may pursue one or several of the above goals. Example measurable objectives and metrics, which must adequately represent progress towards those goals and should also reflect the most important components of the goal, follow:

Obj for Goal 1: Utilize existing LCD products and tools to identify sites of high importance to target species, such as surrogate species, birds of conservation concern (Service 2008), shorebirds of conservation concern (Shorebird Partnership 2015) and federally-listed species to guide management and acquisition of crucial conservation lands. Metrics of success may include number of LCD decision support tools developed; number of LCD goals identified;

Obj for Goal 2: Promote prescribed fire within the GPEA by encouraging the formation and adequate funding of fire cooperatives throughout the GPEA to aid in the application of prescribed fire on private lands; use grazing, where feasible, in combination with prescribed fire to mimic historical disturbance regimes in prairies. Metrics of success may include improved fragmentation index; increased average parcel size; improved habitat quality index;

Obj for Goal 3: Removal of unneeded fencing by the Partners for Fish and Wildlife Program could be guided by an LCD to identify highest priority areas based on likely benefit to trust species. Metrics of success may include proportion of land acquisition projects that used an LCD to consider grassland habitat connectivity; analysis of improved outcome from using LCD;

Obj for Goal 4: When identifying sites for restoration actions, select locations based on LCD analysis to target locations that most enhance connectivity and/or habitat quality for trust species. Metrics of success may include proportion of habitat restoration projects that used an LCD to consider grassland habitat connectivity; analysis of improved outcome from using LCD;

Obj for Goal 5: Continue to build science capacity through the Great Plains Landscape Conservation Cooperative; use the SSP/QRP process to facilitate practical research that informs management decisions; utilize other tools or frameworks currently under development, such as the LEPC Species Status Assessment (SSA) to inform decisions and management/recovery actions under the ESA (because the LEPC is an umbrella species, conservation of this species will support and facilitate conservation of other prairie/grassland species). Metrics of success may include number of SSP/QRP proposals submitted that include a grassland habitat connectivity and/or quality and/or grassland surrogate species element;

Obj for Goal 6: Continue to Partner with NRCS and FSA to utilize programs such as EQIP, CRP, LPCI etc. to achieve conservation of native prairies and grasslands. Metrics of success may include funding leveraged or conservation outcome (e.g., fragmentation index, average parcel size) improved through coordination with partners;

Obj for Goal 7: Work with Service and GPEA non-Service partners outreach personnel to inform public of the benefits of prescribed fire, costs, and methods to reduce landowner risk. Metrics of success may include website visitation or public attendance at Service event.

Literature Cited

- Knopf, F.L. and F.B. Samson. 1995. Conserving the biotic integrity of the Great Plains. Pp. 121-133 *In* S.R. Johnson and A. Bouzaher, editors. Conservation of Great Plains Ecosystems: Current Science, Future Options. Kluwer Academic Press. Dordrecht, Netherlands. 434 pp.
- U. S. Fish and Wildlife Service. 2008. Birds of conservation concern 2008. U.S. Department of Interior, Fish and Wildlife Service, Division of Migratory Bird Management, Arlington, Virginia, <<http://www.fws.gov/migratorybirds>>.
- U.S. Shorebird Conservation Plan Partnership. 2015. U.S. Shorebirds of Conservation Concern – 2015. <<http://www.shorebirdplan.org/science/assessment-conservation-status-shorebirds/>>

Name of Emphasis Area: Great Plains

Title of the Key Conservation Priority: Balancing Wind Energy Development with Species Conservation in the Southern Great Plains

Description of the Key Conservation Priority: Renewable energy is a high priority for the country because it can reduce dependence on fossil fuels and reduce carbon emissions that contribute to climate change. The Great Plains region provides favorable conditions for producing wind energy, resulting in rapid development in this region. The Service supports the responsible development of wind resources; however, wind development can threaten fish and wildlife resources on the landscape.

Wind turbines and windfarms can have negative effects on many animal species in the Great Plains ecosystem. Direct mortality occurs to birds and bats when they fly in the path and collide with blades or other infrastructure. This impact can be substantial when wind projects are sited in high bird use areas, such as the playa lakes region, or in habitats of species intolerant of anthropogenic structures. Indirect effects also occur, such as removal of prairie dogs to deter eagles as well as habitat fragmentation which reduces habitat quantity and quality for many grassland dependent species.

Why is this a high priority for the Service in the Great Plains?

The Service has a responsibility to protect trust species that are potentially impacted by wind energy development, such as the lesser prairie-chicken and other species in the Great Plains. The region's location within the Central Flyway puts hundreds of species of migratory birds at risk of collision with turbines in the area.

In addition to direct species protection, the Service has a conservation objective to achieve "functional landscapes capable of supporting self-sustaining fish, wildlife, and plant populations. Functional landscapes are defined as lands and waters with the properties and elements required to *support desirable populations of fish and wildlife, while also providing human society with desired goods and services*, including food, fiber, water, *energy*, and living space." Balancing wind energy development with species conservation is a key example of providing functional landscapes for people and wildlife.

What are the most important relevant FWS Trust Resources and programmatic responsibilities?

Trust resources: Important trust resources affected by wind energy development include migratory birds, resident grassland birds, bald and golden eagles, and the threatened lesser prairie-chicken. Temperate grasslands represent one of the most altered ecological systems on earth; the grasslands in this Emphasis Area include an assemblage of over 2,000 native plant and animal species. Playa habitats are interspersed with grasslands and serve as biodiversity centers, hosting more than 200 species of birds and other wildlife annually.

Programmatic responsibilities: The Service's Ecological Services division has primary responsibility for administering the Endangered Species Act (ESA) within the Emphasis Area. Partners such as NRCS (Lesser Prairie-Chicken Initiative) and WAFWA (Range-wide Plan (RWP) implemented under the chicken's 4(d) rule) work closely with Ecological Services. Additionally, Ecological Services shares

responsibility with the Division of Migratory Birds in providing technical assistance to wind energy developers on implementation of the Service's Wind Energy Guidelines (WEG). The Division of Migratory Birds is primarily responsible for administering the Migratory Bird Treaty Act and Bald and Golden Eagle Protection Act. Under the Eagle Act, wind energy developers voluntarily implement the Service's Eagle Conservation Plan Guidance (ECPG). The purpose of the guidance is to minimize potential effects to eagles and, if necessary, apply for an Eagle take permit issued by Migratory Birds.

How does it support the Emphasis Area approach?

This is an opportunity to advance proactive, landscape-scale conservation actions to benefit our trust resources and our mission in a way that we could not do without an integrated, multi-programmatic approach. Wind energy development can be expansive on the landscape, with a single project affecting hundreds of acres. Its effects can be significant - including direct mortality as well as habitat fragmentation effects that extend from terrestrial habitat to airspace resources. While our resources are limited, there are multiple efforts underway among Region 2, the Service, and our partners that offer immediate benefits to Region 2 through simply organizing and coordinating our existing efforts and developing strong inter-program communication and coordination to help us achieve our desired conservation outcome.

Conservation Goals:

The Service's desired conservation outcome is sustainable populations of trust species. This outcome is achieved in cooperation with wind energy development by minimizing both direct mortality and indirect impacts, and by maximizing the quality and connectivity of our landscapes and airspace.

We have identified seven goals that represent some ways (not listed in priority order) in which the Service can develop a coordinated approach to support this outcome:

1. Develop and implement a staff education campaign to raise awareness about the wind energy industry, potential applications for each program, and what others within and outside Region 2 and the Service are doing.
2. Support the development of Landscape Conservation Design (LCD) projects to include windfarm locations and projected development areas, and implement these models to incorporate wind energy projections into Service decision-making that includes site selection for species protection and habitat connectivity and intactness (e.g., Refuge expansion, Partners for Fish and Wildlife restoration site selection).
3. Implement a standard procedure to consider the influence of wind energy development (through LCDs and other information sources) on species and their habitats when working on ES decisions or projects.
4. Support research to better understand wildlife-windfarm interactions. This research may inform new technology, siting strategies, and other approaches that may reduce impacts.
5. Directly influence the wind energy industry to support wildlife-friendly approaches to site identification and technological approaches.
6. Develop and implement a public education campaign to raise awareness about potential wildlife impacts of wind energy.

7. Partner with conservation and other concerned organizations outside the Service (through LCCs and other means) to share information, develop strategies, and raise awareness.

Measurable Objectives:

The Service may pursue one or several of the above goals. Example measurable objectives and metrics, which must adequately represent progress towards those goals and should also reflect the most important components of the goal, follow:

Obj for Goal 1: Implement a Regional strategy that defines roles and responsibilities of Service programs such as Ecological Services and Migratory Birds. Metrics of success may include responses to a wind energy awareness survey at different stages of the education campaign; the number of Service biologists trained and mentored to review Bird and Bat Protection Plans; and website metrics measuring traffic on internal wind energy informational web resources;

Obj for Goal 2: Develop a GIS-based resource map that compiles existing information and delineates “no build” areas that have special management considerations or are important to identified trust resources. Metrics of success may include proportion of restoration project decisions that considered wind energy development in a landscape context;

Obj for Goal 3: Develop tools (e.g., Bird and Bat conservation Strategy template, Best Management Practices for specific resources) that can be made available for project proponents; develop a checklist of expectations for Service biologists reviewing Bird and Bat Protection Plans. Metrics of success may include proportion of ES projects that considered wind energy development as a direct or indirect impact;

Obj for Goal 4: Evaluate how wind energy may affect the on-the-ground preservation efforts. Metrics of success may include number of SSP/QRP proposals submitted that include a wind energy research element;

Obj for Goal 5: Engage the wind industry to fully implement the available guidance, initiatives and rules (e.g., WEG, ECPG, RWP) in order to avoid important landscape resources; work with External Affairs to develop justification that it is “good business” to collaborate with natural resource agencies to establish long-term wind farms in areas with limited likelihood of conflict with wildlife. Metrics of success may include the number of Service-reviewed Bird and Bat Protection Plans developed and implemented for proposed and operating wind facilities; number of wind projects enrolled in the RWP.

Obj for Goal 6: Coordinate with External Affairs to develop talking points to substantiate support and link “renewable energy” with “best management practices” to ensure the protection of bird and bat species (i.e., link “clean energy” to “safe energy”).

Obj for Goal 7: Engage with partners such as the Environmental Defense Fund or the American Wind and Wildlife Institute who might provide guidance and resources on risk assessments and other topics.

Name of Emphasis Area: Great Plains

Title of the Key Conservation Priority: Conservation of Ecological Function of Prairie Rivers and Streams in the Southern Great Plains

Description of the Key Conservation Priority:

Prairie rivers and streams rank among the most productive habitats in all of the prairie region. Fish species endemic to prairie streams in the Great Plains Emphasis Area have been subject to significant declines in native ranges and population numbers from habitat alteration and extended periods of drought over the past several years. Of particular interest to the Service and the Emphasis Area approach are the pelagic spawning fishes. This particular guild of fish requires a relatively long stretch of unaltered free flowing river to complete its life cycle (up to 100 miles). Thus, conservation will require numerous partners and stakeholder to ensure their survival.

Among the pelagic spawners, three species are protected by the Endangered Species Act, the smallmouth shiner and sharpnose shiner from the upper Brazos River system in Texas are federally listed as endangered and the Arkansas River shiner from the Canadian River in Oklahoma and Texas is listed as threatened. To further exacerbate the issue, all three of the above-listed fish are considered annual species, with most individuals living only 18 months and spawning only one season. Thus, back-to-back drought conditions can have immediate and long-lasting impacts on the species. These threats are exacerbated by existing anthropogenic factors such as surface and groundwater depletion, development of instream impoundments, instream barriers, channelization, and the spread of exotic invasive species.

Conservation of listed species within an emphasis area is a high priority for the Service. These listed species are representatives of the prairie stream ecosystem within the Great Plains landscape. In 2011, severe drought conditions prompted Service and state biologists to capture and transport wild smallmouth and sharpnose shiners to a hatchery for fear of an extinction event if the drought continued. Relief from the drought occurred the following year and currently the fish shows signs of recovery in the upper Brazos River.

Additionally, water resources are becoming scarce as ongoing drought continues and the human population expands. Water strategies within the prairie rivers and streams region include new reservoir development and other water diversion strategies that would impact the species and their habitats. Competition for water resources is an issue that will need to be addressed with Federal and state partners for long term solutions to be effective.

Trust Resources:

The Arkansas River shiner, smalleye shiner and sharpnose shiner are the trust species for this Conservation Priority. Other native prairie species such as the peppered chub and prairie chub are also in significant decline, both of which are awaiting 12-month findings by the Service. Additionally, the Arkansas darter is undergoing a Species Status Assessment to determine the extent of its decline.

Programmatic Responsibilities:

Ecological Services is primarily responsible for administering the Endangered Species Act, which includes providing guidance on recovery of listed species. The Division of Fisheries provides technical expertise, conducts research and survey activities and maintains hatcheries for captive propagation. Prairie Rivers and Streams has been identified as one of three highest-priority habitats for the Great Plains LCC partnership.

Conservation Goals:

The conservation goals for prairie rivers and streams are to:

- a. Address fragmentation and barriers in prairie rivers and streams to conserve fish and other aquatic resources.
- b. Promote water conservation to maintain surface water within the Emphasis Area.
- c. Develop/refine best management practices in a Strategic Habitat Conservation framework
- d. Support research to determine specific biotic and abiotic associations and/or requirements of high-priority species,
- e. Develop and fund research projects to understand stream and aquifer dynamics.

Measurable Objectives: To achieve the conservation goals for prairie rivers and streams, the following objectives have been developed:

- Develop watershed-based Landscape Conservation Design (LCD) efforts aimed at informing management decisions both in the aquatic landscape and within the terrestrial landscape with potential to impact aquatic resources;
- Streamline permitting/funding process for National Fish Passage Program for delivery (such as through PFW program);
- Work with Partners to develop a strategy to secure water rights. Consider utilizing the fish passage program;
- Control Invasive species along priority stream reaches;

- Reduce fragmentation and consider existing barriers and lack of water;
- Restore riparian habitats;
- Engage water planning regions/districts to promote water conservation strategies and water quality; and
- Utilize cost-share or grant programs to provide funding for landowners and conservation districts to restore river morphology and stream connectivity.

Name of Emphasis Area: Great Plains

Title of the Key Conservation Priority: Playa Wetland Conservation in the Southern Great Plains

Description of the Key Conservation Priority: Playas are shallow, circular, and highly ephemeral wetlands dotting the surface of the Southern Shortgrass Prairies. Although playas occur everywhere, they are nowhere as numerous as on the Southern High Plains (SHP) of Texas and New Mexico. The SHP is an 82,000 km² tableland south of the Canadian River. Playas in this area average 6.3 ha in size; approximately 19,340 occur in Texas and 2,460 in New Mexico, compared to approximately 3,590 north of the Canadian River. Individual playas (and playa complexes) offer localized sites of ecological diversity within a largely arid plains community. As recharge wetlands, they provide the additional benefit of recharging groundwater. Playas are characterized by their topographical and geological conditions and do not always contain water in a landscape where precipitation can be spotty and unpredictable. Dry playas are important to conserve because of their potential to refill and provide important habitat and ecological function when conditions permit. However, the Great Plains Emphasis Area is largely under private ownership, and playas are subject to plowing and pitting, reducing their ability to perform these vital functions.

Why is this a high priority for the Service in the Great Plains?

In 1988, the Service identified playas as a highly ranked priority for acquisition and management due to their value as wildlife habitat. Playas support highly diverse flora and fauna even within an area of intense cultivation in a semi-arid grassland system. Playas are important winter habitats for migratory birds. In wet winters, numbers of waterfowl species using playas may exceed 2 million, and sandhill cranes may exceed 400,000. Although concentrations of waterfowl (i.e., northern pintail and American wigeon) and shorebirds (i.e., interior snowy plovers, American avocet, long-billed dowitcher) are often spectacular, especially during the winter and migration periods, the diversity of terrestrial bird species (i.e., grasshopper sparrow, lark bunting, McCown's longspur, and lesser prairie-chicken) can often be greater. The diverse flora of playa wetlands adds significantly to the overall diversity of the southern prairies and likely supports insect pollinators as well as other invertebrate species.

What are the most important relevant FWS Trust Resources and programmatic responsibilities?

Trust resources: Important trust resources benefited by playa systems include many migratory waterfowl, shorebirds, and terrestrial species, including the federally threatened lesser prairie-chicken.

Programmatic responsibilities: Playas support species that use associated and nearby Refuges, supporting Refuges in conservation of these species. Migratory birds depend on functioning playa wetland systems for wintering and migration. Playa wetlands have been identified as one of three highest-priority habitats by the Great Plains LCC partnership.

How does it support the Emphasis Area approach?

Conservation of playas is a landscape-scale issue because they function not independently but as a network across the landscape, with some proportion of playas wet and some proportion dry at any given time. Because they are interspersed throughout grassland habitats, this priority ties in closely to the Emphasis Area's grassland conservation priority. Additionally, species affected by playa conservation

are also potentially affected by wind energy development, another high priority for the Great Plains Emphasis Area. The landscape focus along with the need to work with private landowners lends itself well to a coordinated multi-programmatic Emphasis Area approach.

Conservation Goals:

The desired conservation outcome is a network of intact playas across the landscape that support migratory bird and other species. Conservation goals include:

1. Develop a Landscape Conservation Design (LCD) to inform management decisions and strategies. This LCD effort will include:
 - a. Update and enhance existing land cover data that are available to identify and inform management;
 - b. Identify critical clusters of playa wetlands that provide the maximum ecosystem benefits through use and refinement of decision support tools that address playa conditions, landscape conditions, bird behavior (winter home range, foraging flight distance), and current/projected threats;
 - c. Identify current and likely future impacts to playa wetland systems;
 - d. Address geographic distribution and habitat relationships of key species (e.g., surrogate species)
2. Continue to support and start research projects using bird species to equate ecosystem health to current on the ground stressors / impacts
3. Continue to work with partners, including existing partnerships such as the Playa Lakes Joint Venture and the Great Plains LCC, to fund private land initiatives aimed at restoring/conserving playa wetlands in strategic areas (identified through decision support tools and landscape planning efforts)

Measurable Objectives: Example measurable objectives that measure progress towards our desired conservation outcome include:

1. Conserve playas through restoration, easements, and acquisition in critical playa wetland complexes (strategic areas), as identified through decision support tools and landscape conservation designs developed by the Service and its partners;
2. Increase or maintain the potential of playas to provide crane use-days, shorebird use-days, and duck use-days;
3. Restore and enhance 1,000 acres of playa wetlands that have been identified as being impacted by historic or current threats, such as modifications related to agriculture [note to Region 2 leadership: 1,000 ac will be refined as landscape conservation design efforts are pursued in the Southern High Plains]

Name of Emphasis Area: Great Plains

Title of the Key Conservation Priority: Conservation of Saline Lake Ecosystems in the Great Plains

Description of the Key Conservation Priority:

Saline lakes are a unique wildlife resource found in a specific geographical area with the Southern High Plains of Texas and New Mexico. Saline lakes are discharge lakes that historically had a historical reliable water source from one or more active springs. Water demand for agriculture and other human use has recently depleted groundwater levels in this region, reducing the availability of water from active springs. In 2013, it was estimated that of the approximately 50 lakes in the region, less than 10 were still functioning. In addition to saline lakes in the Southern High Plains, there are about 3 large saline lakes (or flats) in northcentral Oklahoma. These saline systems are typically found along rivers, and are associated with natural upwellings (or piping) of underground water to the surface. These systems are also threatened by lowering of underground water levels, upstream water use in and adjacent to tributaries for hydrologic fracking, oil and gas development, and within stream modifications and damming. Common threats to saline lakes systems in the Southern High Plains and in Oklahoma include invasive species encroachment and lowering water tables.

Why is this a high priority for the Service in the Great Plains?

Though the saline lakes on the Southern High Plains and Oklahoma differ in function and origins, both support wildlife trust species, particularly migratory birds, of importance to the Service. All saline lakes are important to shorebirds that migrate through the interior of North America, including many arctic nesting species. Saline lakes are an important resource for two Region 2 Refuges, Muleshoe NWR and Salt Plains NWR, which have a responsibility to protect migratory bird species (such as sandhill cranes) that use these habitats. Strategic conservation of saline lakes is complicated by several factors of concern to the Service: energy development, groundwater depletion, and invasive species.

What are the most important relevant FWS Trust Resources and programmatic responsibilities?

Trust resources: The primary trust resource is migratory birds that depend on the lakes for breeding, migration, and winter habitats. Saline lakes are critical breeding habitat to snowy plovers, both USFWS “focal species” and a “bird of conservation concern”. Salt Plains NWR, in particular, provides habitat for approximately 25% of the continental population of snowy plovers and also has the highest breeding density of this species. Likewise, saline lakes in the Southern High Plains providing roosting/loafing sites for up to 80% of the Mid-continent Population of sandhill cranes during winter. Muleshoe NWR and Salt Plains NWR each provide wintering/migration habitat for approximately 15% of the Mid-continent Population of sandhill cranes, with peak numbers often exceeding 100,000 cranes at both refuges. Other important trust species using saline lakes including interior least terns, wading birds, golden eagles, bald eagles, whooping cranes, and waterfowl.

Programmatic responsibilities: Saline lakes are critical to the mission of Refuges, Migratory Birds, and Ecological Services (certain saline lakes are designated critical habitat for listed species) in Region 2, and are an important component of a landscape approach for the Mission of the Service in this region.

How does it support the Emphasis Area approach?

Strategic conservation of saline lakes is complicated by several factors of concern to the Service: energy development, groundwater depletion, and invasive species. One of the most significant threats to these lakes is groundwater for domestic and agricultural purposes in the southern Great Plains. Additionally, invasive woody species such as salt cedar can deplete groundwater on a local scale, further reducing surface water availability. Use of ground and surface water for oil and gas production is a current and future threat to surface water availability in these lakes. The loss of predictable surface water negatively affects the ability shorebirds to breed and raise young during the summer months. All of these threats are complicated and affect large landscapes, requiring a coordinated, multi-programmatic response within the Service. This is an opportunity to advance proactive, landscape-scale conservation actions to benefit our trust resources and our mission in a way that required a coordinated, multi-program, broad-scale response.

Conservation Goals: Primary needs within the next five years are:

1. Develop a Landscape Conservation Design (LCD) that:
 - a. pulls together existing data held on the migratory birds known to use these habitats in consistent manner; and
 - b. addresses projected landscape changes (agricultural and energy driven), water resource threats, and environmental/climatological threats.

Work within the Service and with partners (such as the Great Plains LCC) to use LCD to assist in developing an outcome-based strategy for both short and long-term conservation of saline lakes and the wildlife populations dependent upon them.

2. Coordinate within the Service and with partners to continue long-term monitoring of key species, such as long-billed curlew, snowy plover, golden eagle, and lesser sandhill cranes.

These efforts will allow a cross-programmatic approach to landscape use of these wildlife populations.

Measurable Objectives:

- 1)** Pursue work on at least 5 saline lake-dependent species or species guilds that will provide information on: how they use saline lakes (e.g., feeding, roosting, nesting), how they use key components of saline lakes (springs, freshwater inflows, salt flats), and how they use surrounding lands (croplands, prairies, freshwater). Additionally, accumulate information to allow for linkages between population numbers and habitat availability for these key species, and accumulate information on direct and indirect threats to these species and/or habitats. Suggested species include, but are not limited to, snowy plovers (breeding), sandhill cranes, golden eagles, migrant shorebirds (complete or partial guild), and dabbling ducks (*Anas* spp.).
- 2)** Within two years, begin developing landscape conservation plans that address the 5 key species or species guilds, and within 4 years begin incorporating this information into a landscape conservation strategy that address all 5 species.

- 3)** Immediately, begin developing strategies to deal with known and/or likely threats to saline lakes; strategy development for major issues such as ground water depletion, water use, and wind development can occur concurrently with gathering information on how these threats impact key species that use saline lakes. This may involve increasing the capacity of the FWS to address permits, work with wind developers, and conduct biological planning.
- 4)** Immediately increase the capacity of the FWS to address invasive species issues on saline lakes; prioritize available invasive species funds to address needs of saline lakes and associated species.
- 5)** Increase the capacity of the FWS to work with partners to conserve saline lakes through easements and acquisition.
- 6)** Encourage cross-programmatic work within the Service address migratory bird goals, T&E species listing needs, T&E species recovery planning, and water conservation as it relates to saline lakes.