United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
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January 29, 2015

In Reply Refer To:
02ETAR00-2014-F-0485

Memorandum

To: Chief, Wildlife and Sport Fish Restoration, Albuquerque, NM
(Attn: Nichole Jimenez)

From: Acting Field Supervisor

Subject: Biological Opinion for research project, *Understanding the Ecology of Lesser Prairie-Chickens in Conservation Reserve Program Dominated Landscapes with Implications Toward Lesser Prairie-Chicken Management in Texas*

This memorandum responds to your request dated September 2, 2014, for formal consultation pursuant to the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.), on the proposed Federal funding of the research project, *Understanding the Ecology of Lesser Prairie-Chickens in Conservation Reserve Program Dominated Landscapes with Implications Toward Lesser Prairie-Chicken Management in Texas* to be conducted in Bailey and Lamb Counties, Texas, and its effects on the threatened lesser prairie-chicken (*Tympanuchus pallidicinctus*). Your request was received on September 19, 2014.

The following biological opinion is based on information provided by the applicant (Texas Parks and Wildlife Department (TPWD)), the project researchers from Texas Tech University, the Intra-Service Section 7 Biological Evaluation Form, data in the Arlington, Texas, Ecological Services Field Office (ARLES) files, and discussions with biologists knowledgeable about the species.

Consultation History

August 20, 2014 – ARLES received an Intra-Service Section 7 Biological Evaluation Form for a research grant application entitled *Understanding the Ecology of Lesser Prairie-Chickens in Conservation Reserve Program Dominated Landscapes with Implications Toward Lesser Prairie-Chicken Management in Texas*. The form indicated that the proposed research "may affect, but is not likely to adversely affect" lesser prairie-chickens.

August 28, 2014 – Phone conversation between ARLES staff and Nichole Jimenez of the Office of Wildlife & Sport Fish Restoration to discuss the possibility of modifying the determination of "may affect, but is not likely to adversely affect" to "may affect, is likely to adversely affect" due to the nature of proposed research activities. A consensus was reached to change the determination of effect and pursue formal consultation, and a list of items needed to initiate formal consultation was communicated.

September 19, 2014 – Received Memorandum from the Office of Wildlife & Sport Fish Restoration requesting formal consultation. Information included within the Application Form for Wildlife Research Grant FY 2015 to 2017 and the Intra-Service Section 7 Biological Evaluation Form will serve as the BE, along with needed future correspondence between ARLES, Nichole Jimenez, TPWD, and Dr. Blake Grisham (Principal Investigator) of Texas Tech University.

October 7, 2014 – Sent Memorandum to Nichole Jimenez indicating that ARLES had accepted the request for formal consultation and that the due date for providing a final biological opinion would be February 1, 2015.

January 21, 2015 – Draft biological opinion sent to the Office of Wildlife & Sport Fish Restoration for review.

BIOLOGICAL OPINION

I. Description of Proposed Action

The primary proposed action is the Federal funding of the research project, *Understanding the Ecology of Lesser Prairie-Chickens in Conservation Reserve Program Dominated Landscapes with Implications toward Lesser Prairie-Chicken Management in Texas*. The research project and section 10(a)(1)(A) Recovery Permit associated with this action would be conducted on Conservation Reserve Program (hereafter, CRP) lands in Bailey and Lamb Counties, Texas. Monitoring requirements will be described in the 10(a)(1)(A) Recovery Permit and are summarized in this Biological Opinion. The purpose of this project would be to better understand the ecology of lesser prairie-chickens (hereafter, LEPC) in CRP dominated landscapes and the southern extent of the species range to better inform current and future conservation actions. Four major tasks will be conducted:

Task 1: Capture – Up to 300 LEPCs will be captured on leks during late winter (February) and spring (March – April) using magnetic drop nets and walk-in funnel traps. Gender and morphological measurements will be recorded, and 20 captured females and possibly a subsample of males will be fitted with rump-mounted satellite transmitters before release on site.

Task 2: Relocation – Relocation data from transmitter-equipped LEPCs will consist of four GPS locations recorded each day.

Task 3: Nest Location and Vegetation Surveys – Nest locations will be determined from GPS relocation data. Each nest will then be physically visited by the researchers initially to determine clutch size, then revisited to assess status of the nest (depredated, hatched) only if the hen is determined by GPS to be off the nest. Nest vegetation structure will be determined within three days of nest failure or success for all nest sites.

Task 4: Brood Flush Counts – Transmitter-equipped brooding female LEPCs will be located and flushed at seven-day intervals from 14 to 60 days (2 to 9 total times) to count the number of chicks in each brood.

This biological opinion on the activities described in the grant work plan focuses on research/conservation actions to be taken addressed through a section 10(a)(1)(A) Recovery Permit; however, in implementing those actions (particularly those that involve capture and handling of individual animals), there may be injury or mortality to some individuals, which is estimated in the incidental take statement in this biological opinion. This biological opinion provides section 7 coverage to the U.S. Fish and Wildlife Service (Service) for the issuance of funding for the project and the activities associated with research and recovery. A Federal section 10 Recovery Permit for LEPCs (which would include capture and handling) is currently in development. Until the Federal Permit is available, individuals conducting the proposed actions will be covered as designated agents of the State of Texas under the current section 6 agreement between TPWD and the Service. This consultation evaluates the section 10 activities and the Federal funding.

II. Status of the Species/Critical Habitat

The current list of federally threatened, endangered, and proposed species that are known to occur, or have been documented in Bailey and Lamb Counties is presented in Table 1. Proposed species are not afforded Federal protection under the Act; however, the Service recommends that potential impacts to these species be considered during project planning.

Table 1. Federally listed species known to occur in Bailey and Lamb Counties, Texas.

Common Name	Scientific Name	Status	County
interior least tern	*Sterna antillarum*	Endangered	Bailey, Lamb
sharpnose shiner	*Notropis oxyrhynchus*	Endangered	Bailey, Lamb
smalleye shiner	*Notropis buccula*	Endangered	Bailey, Lamb
whooping crane	*Grus americana*	Endangered	Bailey, Lamb
piping plover	*Charadrius melodus*	Threatened	Bailey, Lamb
lesser prairie-chicken	*Tympanuchus pallidicinctus*	Threatened	Bailey, Lamb
red knot	*Calidris canutus rufa*	Proposed Threatened	Bailey, Lamb

The threatened piping plover and proposed threatened red knot are known to occur in Bailey and Lamb Counties during migration, but currently the Service recommends they be evaluated only for wind energy projects within these counties.

The Service also recommends that the endangered interior least tern be evaluated only for wind energy projects within Lamb County. In Bailey County, this species has been recorded at Paul's Lake at Muleshoe National Wildlife Refuge. However, no activities covered in this biological opinion would take place near Paul's Lake; the probability of encountering an interior least tern at other locations in the project area is minimal, and impacts to interior least terns resulting from the proposed actions are highly unlikely. For these reasons, it is anticipated that the proposed action would have no effect on interior least terns; and therefore, this species is not considered further in this biological opinion.

The sharpnose shiner and smalleye shiner are also both listed in Bailey and Lamb Counties but would only need to be evaluated for projects that affect waterbodies and floodplains associated with the Brazos River downstream. The proposed actions covered in this biological opinion would not affect any such waterbodies; and therefore no effects to these species would be expected. The sharpnose shiner and smalleye shiner are not considered further in this biological opinion.

Whooping cranes are transient, potentially occurring within the counties encompassing the action area during their annual migration. It is unlikely that whooping cranes would be utilizing the areas in which activities covered in this biological opinion would be performed due to a general lack of preferred whooping crane habitat on CRP lands. Further, the research actions planned are highly unlikely to adversely affect whooping cranes. For these reasons, it is anticipated that the proposed action would have no effect on whooping cranes; and therefore, this species is not considered further in this biological opinion.

The federally listed species that does occur in the action area and that would be affected by the proposed actions is the LEPC. This species was listed by the Service March 27, 2014 (79 FR 19974). Critical habitat has not been designated for this species and a Recovery Plan for this newly listed species has not been completed.

Species Description and Life History

The LEPC is a species of prairie grouse endemic to the southern high plains of the United States, commonly recognized for its feathered feet, stout build, ground-dwelling habit, and lek mating behavior. Plumage is characterized by a cryptic pattern of alternating brown and buff-colored barring, and is similar in mating behavior and appearance, although somewhat lighter in color, to the greater prairie-chicken (*T. cupido pinnatus*). Males have long tufts of feathers on the sides of the neck (pinnae) that are erected during courtship displays. Pinnae are smaller and less prominent in females. Males also display brilliant yellow supraorbital eyecombs and dull reddish esophageal air sacs during courtship displays (Copelin 1963, p. 12; Sutton 1977, entire; Johnsgard 1983, p. 318). Female LEPCs are generally smaller than the males. Adult body length varies from 38 to 41 centimeters (cm) (15 to 16 inches (in)) (Johnsgard 1973, p. 275;

Johnsgard 1983, p. 318), and body mass varies from 734 to 813 grams (g) (1.6 to 1.8 pounds (lbs)) for males and 628 to 772 g (1.4 to 1.7 lbs) for females (Giesen 1998, p. 14).

The preferred habitat of the LEPC is native short- and mixed-grass prairies having a shrub component dominated by *Artemesia filifolia* (sand sagebrush) or *Quercus havardii* (shinnery oak) (hereafter described as native rangeland) (Donaldson 1969, pp. 56, 62; Taylor and Guthery 1980, p. 6; Giesen 1998, pp. 3–4). Small shrubs are important for summer shade (Copelin 1963, p. 37; Donaldson 1969, pp. 44–45, 62), winter protection, and as supplemental foods (Johnsgard 1979, p. 112). Historically, trees and other tall woody vegetation were largely absent from these grassland ecosystems, except in canyons and along water courses. Landscapes supporting less than 63 percent native rangeland appear incapable of supporting self-sustaining LEPC populations (Crawford and Bolen 1976, p. 102).

LEPCs are polygynous and exhibit a lek mating system using leks where males traditionally gather to conduct a communal, competitive courtship display using their specialized plumage and vocalizations to attract females for mating. Males exhibit strong site fidelity to their display grounds (Copelin 1963, pp. 29–30; Hoffman 1963, p. 731; Campbell 1972, pp. 698–699) whereas females, due to their tendency to nest within 2.5 km (1.5 mi) of a lek (Giesen 1994, p. 97), also may display fidelity to nesting areas but the degree of fidelity is not clearly established (Schroeder and Robb 1993, p. 292). However, Haukos and Smith (1999, p. 418) observed that female LEPCs are more likely to visit older, traditionally used lek sites than temporary, nontraditional lek sites (those used for no more than 2 years).

Leks are normally located on the tops of wind-swept ridges, exposed knolls, sparsely vegetated dunes, and similar features in areas having low vegetation height or bare soil and enhanced visibility of the surrounding area (Copelin 1963, p. 26; Jones 1963a, p. 771; Taylor and Guthery 1980, p. 8). Females arrive at the lek in early spring after the males begin displaying, with peak hen attendance at leks typically occurring in early to mid-April (Copelin 1963, p. 26; Hoffman 1963, p. 730; Crawford and Bolen 1975, p. 810; Davis *et al.* 1979, p. 84; Merchant 1982, p. 41; Haukos 1988, p. 49). Within 1 to 2 weeks of successful mating, the hen will select a nest site, normally within 1 to 3 km (0.6 to 2 mi) of a lek (Copelin 1963, p. 44; Giesen 1994, p. 97), construct a nest, and lay a clutch of 8 to 14 eggs (Bent 1932, p. 282; Copelin 1963, p. 34; Merchant 1982, p. 44; Fields 2004, pp. 88, 115–116; Hagen and Giesen 2005, unpaginated; Pitman *et al.* 2006, p. 26). Nesting is generally initiated in mid-April and concludes in late May (Copelin 1963, p. 35; Snyder 1967, p. 124; Merchant 1982, p. 42; Haukos 1988, pp. 7–8).

LEPCs forage during the day, usually during the early morning and late afternoon, and roost at night (Jones 1964, p. 69). Diet is very diverse, primarily consisting of insects, seeds, leaves, and buds and varies by age, location, and season (Giesen 1998, p. 4). They forage on the ground and within the vegetation layer (Jones 1963b, p. 22) and are known to consume a variety of invertebrate and plant materials. Generally, chicks and young juveniles tend to forage almost exclusively on insects, such as grasshoppers and beetles, and other animal matter while adults tend to consume a higher percentage of vegetative material (Giesen 1998, p. 4).

Nests generally consist of bowl-shaped depressions in the soil (Giesen 1998, p. 9) and are lined with dried grasses, leaves, and feathers. Adequate herbaceous cover, including residual cover

from the previous growing season, is an important factor influencing nest success, primarily by providing concealment of the nest (Suminski 1977, p. 32; Riley 1978, p. 36; Riley *et al.* 1992, p. 386; Giesen 1998, p. 9).

LEPCs have a relatively short lifespan and high annual mortality. Campbell (1972, p. 694) estimated a 5-year maximum lifespan, and a high annual mortality rate of approximately 65% (Audubon 2015, online).

Historical and Current Distribution

Prior to description by Ridgeway in 1885, most observers did not differentiate between the LEPC and the greater prairie-chicken. Consequently, estimating historical abundance and occupied range is difficult. Historically, the LEPC is known to have occupied native rangeland in portions of Colorado, Kansas, Oklahoma, Texas, and New Mexico. Records also indicate occurrence in Nebraska based on at least four specimens known to have been collected near Danbury in Red Willow County during the 1920s (Sharpe 1968, p. 50); however, none have been observed in Nebraska since that time.

Johnsgard (2002, p. 32) estimated the maximum historical range of the LEPC to have encompassed some 260,000 to 388,500 sq km (100,000 to 150,000 sq mi), with about two-thirds of the historical range occurring in Texas. Taylor and Guthery (1980, p. 1, based on Aldrich 1963, p. 537) estimated that, by the 1880s, the area occupied by LEPC was about 358,000 sq km (138,225 sq mi), and, by 1969, they estimated the occupied range had declined to roughly 125,000 sq km (48,263 sq mi) due to widespread conversion of native prairie to cultivated cropland. Taylor and Guthery (1980, p. 4) estimated that, by 1980, the occupied range encompassed only 27,300 sq km (10,541 sq mi), representing a 90 to 93 percent reduction in occupied range since pre-European settlement and a 92 percent reduction in the occupied range since the 1880s.

In 2007, cooperative mapping efforts by species experts from five State Fish and Wildlife Agencies, in cooperation with the Playa Lakes Joint Venture, re-estimated the maximum historical and occupied ranges. Their estimated total maximum historically occupied range is approximately 466,998 sq km (180,309 sq mi). The approximate occupied range, by State, based on this cooperative mapping effort was 4,216 sq km (1,628 sq mi) in Colorado; 29,130 sq km (11,247 sq mi) in Kansas; 8,570 sq km (3,309 sq mi) in New Mexico; 10,969 sq km (4,235 sq mi) in Oklahoma; and 12,126 sq km (4,682 sq mi) in Texas. Since 2007, the occupied and historical range in Colorado and the occupied range in Kansas have been adjusted to reflect new information. The currently occupied range in Colorado is now estimated to be 4,456 sq km (1,720 sq mi), and, in Kansas, the LEPC is now thought to occupy about 34,479 sq km (13,312 sq mi). The approximate area of occupied LEPC habitat across the entire 5-state range in 2014 was 70,600 sq km (27,258 sq mi)(McDonald *et al.* 2014b, Executive Summary).

The overall distribution of LEPC within all States except Kansas has been reduced since European settlement, and the species is generally restricted to variously-sized habitat patches within a highly fragmented landscape (Taylor and Guthery 1980, pp. 2–5) or areas with significant CRP enrollments that were initially seeded with native grasses (Rodgers and Hoffman

2005, pp. 122–123). The species has expanded north and east in Kansas, even near Nebraska; this expansion in the population is being monitored by the Kansas Department of Wildlife and Parks. The estimated current occupied range, based on cooperative mapping efforts described above, and as derived from calculations of the area of each mapped polygon using geographical information software, represents about an 84 percent reduction in overall occupied range since pre-European settlement.

In the spring of 2012, the States, in conjunction with the Western Association of Fish and Wildlife Agencies, implemented a range-wide sampling framework and survey methodology using small aircraft (McDonald *et al.,* 2014a). This aerial survey protocol was developed to provide a more consistent approach for detecting range-wide trends in LEPC population abundance across the occupied range. The goal of this survey was to estimate the abundance of active leks and provide information that could be used to detect trends in lek abundance over time. The results of the spring 2012 aerial survey indicated a range-wide population estimate of 34,440 birds and 2,930 leks.

In 2013, the surveys were repeated and results indicate a range-wide population estimate of 17,616 birds constituting a 49% decline from the 2012 estimate, and 2,036 leks constituting a 30% decline from 2012 (McDonald *et al.*, 2014a). Most recent aerial surveys utilizing these protocols during the 2014 survey season indicate an estimated total population size of 22,415 (McDonald *et al.* 2014b, Executive Summary).

Reasons for Decline and Threats to Survival

The range of the LEPC has been reduced by an estimated 84 percent primarily due to habitat loss and fragmentation resulting from a variety of mechanisms, such as conversion of native prairie and grassland to cropland; improper grazing, haying, and herbicide spraying that reduces LEPC habitat quality; long-term fire suppression and encroachment by invasive woody plants; habitat fragmentation caused by energy development and petroleum production and associated vertical infrastructure such as turbines, towers, and utility lines; and prolonged drought.

This habitat loss is a significant threat to the LEPC because the species requires large parcels of intact native grassland and shrubland to maintain self-sustaining populations. Due to its reduced population size and ongoing habitat loss and degradation, the LEPC's resiliency to recover from adverse effects resulting from present and future impacts and persist in the long term is compromised.

Vertical structures such as power poles, transmission lines, etc. historically were not common in LEPC habitat or on or near lek sites. The presence of those structures now provides perches for hawks and owls to sit, observe, and hunt LEPCs habitat making loss of chicks and adults much more likely than before. Additionally, due to decreases in land parcel size over time, more fencing is needed to delineate property boundaries creating a network of low perches for predators across the landscape that historically did not occur at the scale it does today.

Grazing, haying and mowing can contribute to increased predation as well by reducing grass height LEPCs have historically relied upon for food and cover. If these activities are applied at

an inappropriate frequency, intensity, time, or duration across a larger landscape, the collective effect of loss of cover (to hide from predators), thermal cover (to stay warm in the winter), and reduced food sources can result in significant harm to local populations.

Range-wide Survival and Recovery Needs

The five-State range of the LEPC is being guided by the Range-wide Plan which has substantial conservation and habitat goals emphasizing tools and incentives to encourage landowners and others to voluntarily partner with agencies in LEPC habitat conservation efforts, while also achieving their land use needs. Under the plan, agreements with participating landowners will aim to improve habitat conditions for the LEPC, increase populations and provide for long-term conservation of the species. The plan also establishes a framework for mitigating impacts from a wide range of activities with a goal of providing a net conservation benefit to the species.

In order to address the long-term conservation of the LEPC, the Service suggests implementation of four overarching management goals to address the three primary challenges facing the species. The four management goals are described in detail in a Service technical white paper (Appendix A; drafted before the species was listed but continues to provide guidance for conservation objectives) and includes establishing strongholds, ensuring connectivity, committing to implementation, and providing long-term certainty. Research needs have been initiated by a variety of agencies, consultants, and universities, such as the activities associated with the funding of the proposed action. Additionally, efforts to develop a Recovery Plan and a Species Status Assessment for the LEPC are currently underway.

III. Environmental Baseline

A. Description of the Action Area

The action area encompasses acres currently or recently enrolled in the CRP in Bailey and Lamb Counties, Texas. Observations by local TPWD, Service, and Texas Tech biologists suggest that LEPCs began occupying CRP fields within the last 5 – 10 years, but it is unclear whether LEPCs prefer and/or are more productive in certain types of CRP fields over others and, if so, which type(s) of CRP fields are most beneficial to LEPCs. Specific study sites will be selected based on the presence/absence of LEPC and landowner willingness to participate. The High Plains ecoregion encompasses the entire study area, which is generally higher and drier than the Central Great Plains to the east, and in contrast to the mostly grassland or grazing land of the Northwestern Great Plains to the north. Much of the High Plains is characterized by smooth or slightly irregular planes with a high percentage of cropland. Natural vegetation is typically grama-buffalograss with a narrow band of sand-shinnery running east to west across the northern halves of both counties. Much of the surface water in this ecoregion occurs in seasonal playa lakes that form in small depressions, many of which have been hydrologically modified for cropland or feedlot uses. Average annual rainfall for the action area is approximately 45.34 cm (17.85 in). Average annual high temperature in July is 92 degrees while the annual low is 22.7 degrees in January (Griffith *et al.* 2004).

B. Status of the Species within the Action Area

The action area encompasses CRP lands in Bailey and Lamb Counties. The CRP is a land conservation program administered by the Farm Service Agency (FSA). In exchange for a yearly rental payment, farmers enrolled in the program agree to remove environmentally sensitive land from agricultural production and plant species that will improve environmental health and quality. Contracts for land enrolled in CRP are 10-15 years in length. The long-term goal of the program is to re-establish valuable land cover to help improve water quality, prevent soil erosion, and reduce loss of wildlife habitat. Grasses planted through the CRP program in the action area are generally non-native and often structurally inconsistent with preferred LEPC habitat. Previously, it was thought that LEPCs would not utilize CRP lands with these introduced grasses. However, numerous leks have been discovered on current or expired CRP enrollments in Bailey and Lamb Counties. These leks occur primarily on CRP Type 1 (CP1) enrollment, which are dominated by introduced grass species. This is contradictory to the widespread belief that LEPCs avoid CP1, which is not considered preferred nesting or brood rearing habitat for them (TPWD 2014, p. 3). Land use change over time as CRP contracts expire is also a concern for LEPC population persistence (Woodward *et al.* 2001). Throughout the area including the Texas High Plains, some contract holders may elect to no longer continue the conservation efforts provided through the expiring CRP contract, and either return all acreage to crop production or maintain some or all previous CRP acreage as some form of vegetative cover for haying or grazing (TPWD 2014, p.3). Each of these factors could contribute to LEPCs status in the action area, which are already subjected to less than ideal habitat conditions.

In addition to land usage and vegetative conversion inconsistent with optimal LEPC habitat, energy development from windpower and oil and gas exploration continues to threaten LEPC persistence across much of its range including CRP lands. The Southern Great Plains are currently experiencing significant wind energy and associated infrastructure development, which may also occur on CRP lands. Wind developments include turbines, access roads, and transmission lines. Physical disturbance during construction and operation of wind turbines has the potential to disturb nesting LEPCs. Behavioral avoidance of such areas by LEPCs has the potential to further exacerbate habitat fragmentation concerns.

Pursuant to the 4(d) rule published with the final listing rule for the LEPC (79 FR 20074), participants in the Western Association of Fish and Wildlife Agencies Range-wide Plan will be exempt from section 9 take prohibitions for development activities, including oil and gas, wind, and transmission. Landowners may voluntarily enroll in the plan to benefit the LEPC and generate credits to offset development activity impacts of plan participants. Enrolled landowners are exempted from section 9 take prohibitions for management practices that benefit the LEPC including prescribed grazing, burning, and brush management. Currently there are 8 landowners with approximately 60,000 acres which are either in progress or have completed the enrollment process across the range of the LEPC. There are approximately 180 companies enrolled in the plan covering over ten million acres of land.

Additional conservation efforts by TPWD and other partners continue to address threats; coordinate and target conservation efforts; and initiate agency, landowner, and industry engagement to further LEPC recovery. Funding sources have provided on-the-ground assistance

to farmers and ranchers in maintaining and improving habitat conditions for the LEPC, including reducing fragmentation and improving connectivity.

IV. Effects of the Action

Under section 7(a)(2) "effects of the action" refers to the direct and indirect effects of an action on a species or critical habitat, together with the effects of other activities that are interrelated and interdependent with that action. The effects of the proposed action are added to the environmental baseline to determine the future baseline that serves as the basis for the determination in this biological opinion. The impacts discussed below are the Service's evaluation of the direct and indirect effects of the proposed action. Indirect effects are those caused by the proposed action that occur later in time, but are still reasonably certain to occur (50 CFR 402.02).

The funding of the grant proposal by the Wildlife and Sport Fish Restoration Program will not directly affect the LEPC. However, the research activities to be carried out with the proposed funding are likely to significantly benefit our knowledge of and adversely affect the LEPC. The 3-year research study will be conducted throughout CRP lands in Bailey and Lamb Counties, Texas across 2015 - 2017. This effects analysis is based upon the effects of both the funding of the research and the research activities to be carried out with the proposed funding. Therefore, the effects of these actions are considered together for the purpose of this analysis. The Service anticipates that direct and indirect adverse effects to the LEPC would result from the action as discussed below.

LEPCs will be captured on leks during late winter (February) and spring (March – April) primarily using magnetic drop nets. Walk-in funnel traps will also be placed along the periphery to capture additional individuals. It is anticipated that up to 300 (100 per year, 3 years) LEPCs would be captured, assessed, banded, and immediately released. According to the Principal Investigator, magnetic drop nets would account for approximately 90% of captures and walk-in funnel traps would account for the remaining 10%. Gender and morphological measurements will be recorded, and a total of 20 rump-mounted 17 gram solar-powered GPS satellite transmitters would be fitted to LEPC females and possibly a subset of males. Of these radio-tagged individuals, nest locations will be determined from GPS relocation data. Each nest will then be physically visited by the researchers initially to determine clutch size, then revisited to assess status of the nest (depredated, hatched) only if the hen is determined by GPS to be off the nest. After fledging, transmitter-equipped brooding female LEPCs will be located and flushed at seven-day intervals from 14 to 60 days (a total of 2 to 9 times) to count the number of chicks in each brood. Each of these activities may subject LEPCs to increased levels of stress and/or potential injury, but we anticipate low levels of permanent injury or disturbance.

Direct Effects

It is possible that LEPCs may be injured during capture, handling, radio-tagging, and slightly possible during flush counting. Lead project personnel for this study indicate that they have worked extensively with this species in the past and have rarely observed any obvious signs of

significant injury or distress in handled LEPCs. Unpublished data indicate that injury to LEPCs from unattended walk-in funnel traps usually occurs after initial capture, as they are harassed by other LEPCs or struggle in the trap (Grisham 2014. p. 1). As a precaution to avoid potential injury, project personnel will attend walk-in funnel traps at all times and immediately remove any captured LEPCs to avoid injury.

Indirect Effects

LEPCs caught and released during trapping activities, including those radio-tagged, may appear unharmed at the time of release. However, a small number may be temporarily or permanently impaired due to undetected injury or as the result of stress. However, the project Principal Investigator indicate that after extensive past experience capturing and radio-tagging LEPCs following the same protocols, no data suggest that permanent impairment or death has ever occurred. Individuals will be monitored by the applicant to ensure successful flight after release.

The Federal grant is solely for the purpose of conservation of the species, the effects of which would be later in time. These would be indirect beneficial effects, and are discussed in the following section.

Beneficial Effects

This research study could provide future contributions to the conservation of the LEPC. The goal is to develop an understanding of the ecology of the LEPC in CRP lands at the southern extent of the species' range in west Texas. Currently, it is assumed that the CRP fields within the action area provide all of the necessary habitat requirements (nesting, brood rearing, lekking, wintering, etc.) to support LEPCs year-round. This study could help determine if that assumption is correct. Given the status of the LEPC and the need to develop conservation strategies for CRP dominated landscapes in Texas, an assessment of the breeding ecology, survival, and habitat use in CRP lands would be useful. This might allow an evaluation of the management and mitigation implications of CRP (current and expired) as habitat for LEPCs, facilitate identification of priority areas for management, and determine if the CRP-occupying LEPCs are a viable population or function as a population sink within the regional meta-population matrix (TPWD 2014, pp. 3 - 4). Further, this research could provide information to address recovery needs identified in the Final Rule for the LEPC (FR 79 19974). Likewise, this information could also aid in efforts to produce a Species Status Assessment, which would help to inform future decisions for LEPC management.

Effects of the Action on the Species

Grisham (2014, p. 1) suggests that 6% of LEPCs captured utilizing magnetic drop nest might be adversely impacted from minor, non-life-threatening injuries, the most common being feather breaks or loss. Of the maximum of 300 LEPCs captured, approximately 90% (270 individuals) would be caught with magnetic drop nets. At a 6% injury rate, a total of approximately 16 individuals might sustain temporary non-life-threatening injuries.

Grisham (2014, p. 1) also indicates that walk-in funnel traps can commonly result in injuries to LEPCs (23% of birds captured). However, this high injury rate is due to the passive nature of former techniques in walk-in funnel trapping resulting in LEPCs being injured in traps left unattended for even short periods of time. Unattended funnel-trapped LEPCs often struggle and injure themselves, and are sometimes harassed by others captured in the same trap as well as uncaptured LEPCs outside the trap resulting in further struggle and injury (Grisham 2014, p. 1). Since that time, techniques have been refined to monitor each trap when it is active and immediately remove any birds captured. After this change in protocol, no injuries to LEPCs from walk-in funnel trapping had been observed (Grisham pers. com. January 6, 2015). All walk-in funnel traps used during the current project would be continuously monitored and LEPCs would be removed immediately after capture. However, we believe that all of the approximately 30 LEPCs captured using walk-in funnel traps could potentially be temporarily harassed or otherwise adversely impacted by sustaining non-life-threatening injuries.

Currently unpublished data from a collaboration of researchers from Kansas State, Ohio State, Oklahoma State, and Texas Tech Universities suggest that the radio-tagging of LEPCs shows no reduction of survival (Haukos *et al.* 2014, unpublished). Personal experience shared by the Principal Investigator for the proposed project also suggests no discernable reduction in lifespan or compromised life function from the fitment of GPS transponders (Grisham, pers. comm. December 18, 2014). Therefore, the radio-tagging of 20 LEPCs may only temporarily adversely impact them as a component of capture but would not be expected to impact them additionally. These 20 radio-tagged individuals may be subjected to further adverse impact from nest visits (if the hen is in the vicinity of the vacant nest) or during repeated brood flush counts during the breeding season in which they would be monitored. Although the exact results of these efforts are not known, these further adverse impacts could potentially include nest abandonment from repeated nest visits or separation of the hen and offspring during repeated brood flush counts. The expected capture and release of up to 300 LEPCs and the radio-tagging of 20 individuals of that 300, and subsequent nest monitoring and flush counting is expected to result in no LEPC mortality during the 3-year research study. However, we believe that mortality of at least one LEPC is possible over this 3-year period. Monitoring requirements are discussed within the Reasonable and Prudent Measures section of this document.

V. Cumulative Effects

Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

Because most of the land (approximately 95 percent) in the occupied range of the LPC including the action area is in private ownership, future land use decisions by farmers and ranchers will have the greatest impact on LEPC habitat. These private actions on CRP lands will be influenced by economic and climactic factors, including drought, fluctuating crop prices, and oil, gas, and wind energy development. Much of the information in the remainder of this section is reiterated from the Service's April 14, 2014 Biological Opinion for the implementation of the

CRP within the occupied range of the LEPC as described in the FSA Biological Assessment for the CRP.

Farming and ranching practices can be compatible with LEPC conservation efforts and produce beneficial effects to the species. However, the future conversion of native prairie, rangeland, or other non-CRP grassland habitat to cropland or development uses would have adverse cumulative effects on the LPC across CRP lands including those in the action area. The 2014 Farm Bill includes a provision that is expected to reduce the economic incentive for conversion by linking conservation compliance to crop insurance subsidies. Wildlife agencies are expected to continue to find strategies to work with private landowners, the most important stewards of prairies, grasslands, and LEPC habitat on private property.

The Southern Great Plains (including the action area) contains substantial oil and natural gas deposits and the extraction of these resources has been widely reported to cause adverse impacts to the LEPC. Concern continues that increased densities of wells in the Southern Great Plains will result in further reduced LEPC populations. Hunt (2004) found a higher number of abandoned leks near active well sites. Roads, power lines, pipelines, compressor stations, and other structures all add to the adverse cumulative effects of oil and gas development on LEPC populations including those on CRP lands.

VI. Conclusion

After reviewing the current status of the LEPC, the environmental baseline for the action area, the effects of the proposed funding of the research project and associated research activities, and the cumulative effects, it is the Service's biological opinion that the project, as proposed, is not likely to jeopardize the continued existence of the LEPC. The expected capture and release of up to 300 LEPCs and the radio-tagging of 20 individuals of that 300 is expected to result in no LEPC mortality during the 3-year research study. However, we believe that mortality of at least one LEPC is possible over this 3-year period. Potential adverse impacts to LEPCs would more likely be in form of non-life-threatening injuries sustained during capture, radio-tagging, release, and later brood flush counts. Additional adverse impacts in the form of increased stress may result from all of these research activities, as well as during nest visits if an undetected hen is in the nest vicinity.

Considering the minimal nature of these adverse impacts resulting in low mortality and the relatively small size of the action area in relation to the species range, the potential non-lethal impacts to 300 LEPCs across a 3-year period will not appreciably reduce the likelihood of both the survival and recovery of this species. Further, the potential future beneficial effects of this research may ultimately far offset any initial adverse impacts by guiding essential recovery efforts.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined

as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. "Harm" is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. "Harass" is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this incidental take statement.

The measures described below are non-discretionary, and must be undertaken by the Service or the applicant so that they become binding conditions of any grant or permit issued, as appropriate, for the exemption in section 7(o)(2) to apply. The Service has a continuing duty to regulate the activity covered by this incidental take statement. If the Service (1) fails to assume and implement the terms and conditions or (2) fails to require the (applicant) to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the grant document, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the Principle Investigator(s) for this research project must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement. [50 CFR §402.14(i)(3)]

Amount or Extent of Take Anticipated

Incidental take in the form of capture is expected to occur from the trapping of up to 300 LEPCs during the three years of the research project. Take in the form of capture would also include non-life-threatening injuries from magnetic drop nets (approximately 16 individuals) from walk-in funnel trapping (approximately 30 individuals).

Of these 300 captured, further incidental take in the form of harassment will occur to the 20 individuals (and/or their offspring) which would be radio tagged and later subjected to nest visits and brood flush counts after the brood fledges. The radio-tagging itself would be considered a component of capture and would not be considered harassment. However, repeated nest visits could stress the radio-tagged hen if she is within the nest vicinity potentially impairing her normal nesting behavior, or potentially make nests sites more attractive to predators. Likewise, the repeated brood flush-counting of those 20 individuals and their offspring could potentially alter normal brooding behavior or lead to the hen and offspring becoming separated.

Although unlikely, we believe that the possibility exists that at least one LEPC may be mortally injured or succumb to an undetected stress that results in death during capture, handling, potential nest abandonment (resulting from repeated nest visits), or separation of hen and offspring (resulting from brood flush counts).

Effect of the Take

In the accompanying biological opinion, the Service determined that this level of anticipated take is not likely to result in jeopardy to the LEPC.

Reasonable and Prudent Measures

The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize impacts of incidental take of LEPCs. Because the section 10(a)(1)(A) Recovery Permit is not completed, we address the research activities and anticipated monitoring requirements:

1. An annual Monitoring Report will be provided to the Arlington, Texas Ecological Services Field Office at the end of each field season. The report will include trapping locations, number of trap-days, number of LEPCs captured, and details of injuries sustained while capturing and handling. Any observations or evidence of LEPC mortality or nest loss resulting from implementation of research project practices shall also be included within the Monitoring Report. If any such mortality or nest loss is reported, the Service will respond within 30 days and request to meet with the Principal Investigator and other staff to discuss if changes to project practices might be necessary.
2. Implement field strategies to minimize harm and death to individual LEPCs.

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, the Service must comply with the following terms and conditions, which implement the reasonable and prudent measures, described above and outline required reporting/monitoring requirements. These terms and conditions are non-discretionary.

In order to implement RPM #1

1. Traps will be continually monitored and LEPCs will be immediately removed from the traps after capture to avoid injury or further stress. Handling duration while collecting data will be minimized.
2. The Arlington Field Office should be contacted immediately if an LEPC is mortally injured or capture exceeds 100 individuals in a single year.
3. LEPCs accidently killed will be collected for deposition in an appropriate museum or university collection.

In order to implement RPM #2

4. The number of consecutive trapping days on a lek will be limited and traps will be moved to reduce the potential recapture of territorial males.
5. LEPCs sustaining non-life-threatening injuries will be immediately treated with anti-biotic cream or other suitable treatments as necessary before release.
6. Student assistants may participate in capture and handling under the direct on-site supervision of a qualified individual covered as an agent of the State of Texas under the current section 6 agreement between TPWD and the Service (availability of a Federal section 10 Recovery Permit is forthcoming).

Take in the form of capture will occur to all 300 LEPCs trapped and released. Harassment would occur to the 20 radio-tagged LEPCs (and potentially their offspring) subjected to nest visits and brood flush counts. One LEPC may be mortally injured during the course of the research study. The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the impact of incidental take that might otherwise result from the proposed action. If, during the course of the action, this level of incidental take is exceeded, such incidental take represents new information requiring reinitiation of consultation and review of the reasonable and prudent measures provided. The Service must immediately provide an explanation of the causes of the taking and review the need for possible modification of the reasonable and prudent measures.

Conservation Recommendations

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information. The research associated with this grant addresses conservation needs identified within the Service's Final Rule for the listing of the LEPC (FR 79 19974) for the LEPC. No additional conservation recommendations are necessary.

Reinitiation Notice

This concludes formal consultation on the actions outlined in your request. As provided in 50 CFR § 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

If further assistance or information is required, please contact Mr. Sean Edwards or Omar Bocanegra at (817) 277-1100.

e-copy: Regional Director, FWS, Albuquerque, NM (Attn: ARD-ES; M. Tuegel)
Jay Roberson, TPWD

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Appendix A - USFWS Technical White Paper on Conservation Needs of the LPC

Conservation Needs of the Lesser Prairie-Chicken
U.S. Fish and Wildlife Service Technical White Paper
July 2012

Introduction

The lesser prairie-chicken (*Tympanuchus pallidicinctus*) became a candidate species on June 9, 1998. The species' preferred habitat consists of native short- and mixed-grass prairies with a shrub component dominated by sand sagebrush (*Artemesia filifolia*) or shinnery oak (*Quercus havardii*) (Taylor and Guthery 1980, p. 6; Giesen 1998, pp. 3-4). The species' range extends northward from western Texas and eastern New Mexico into western Oklahoma, eastern Colorado, and western Kansas. The overall distribution of lesser prairie-chickens within all states except Kansas has declined sharply, and the species is generally restricted to limited parcels of untilled native rangeland (Taylor and Guthery 1980, pp. 2-5) or areas with significant Conservation Reserve Program (CRP) enrollments that were initially seeded with native grasses (Rodgers and Hoffman 2005, pp. 122-123). Despite consistent findings that the species warrants listing under the Endangered Species Act, higher priority listing actions have precluded development of a proposed listing rule for the lesser prairie-chicken. Due to the magnitude and immediacy of the threats now faced by the species, the U.S. Fish and Wildlife Service (Service) is in the process of evaluating the current status of the species in preparation of a proposed listing rule with anticipated publication no later than September 2012.

The Service has drafted this white paper as a synopsis of our thoughts on long term conservation and recovery of the lesser prairie-chicken. We appreciate the past and on-going efforts of all stakeholders in lesser prairie-chicken conservation and have taken these into consideration. The Service, however, has the additional responsibility to look into the future and assess future threats to the species. Therefore, as a partner in the conservation of the lesser prairie-chicken, we present this forward-looking document to our partners for their consideration in the on-going development of conservation strategies.

Challenges to Lesser Prairie-Chicken Conservation

The Service has reviewed the available literature on the lesser prairie-chicken and identified three primary challenges to its long-term conservation. First, there are currently insufficient strongholds within the species' occupied and historical ranges to prevent further decline and to increase the chances for long-term survival of the lesser prairie-chicken. In general, the Service considers these strongholds to be important conservation areas within the species' native habitat that is managed or set aside for long-term lesser prairie-chicken conservation and of sufficient size to support a viable lesser prairie-chicken population (see additional description below).

Second, there is a high degree of habitat fragmentation within occupied habitat patches and across the entirety of the species' historical range. Habitat fragmentation occurs when some form of disturbance, usually habitat alteration or loss, results in the separation or splitting apart of larger, previously contiguous, functional components of habitat into smaller, often less

valuable, non-contiguous parcels (Wilcove *et al.* 1986, p. 237; Johnson and Igl 2001, p. 25; Franklin *et al.* 2002, entire). Lesser prairie-chickens are impacted by habitat fragmentation and

this threat is expected to increase over time due to proposed energy developments coupled with potential agricultural conversion, incompatible livestock grazing, and other ongoing land uses.

Third, due to the species' small population size, low survival rates, and scattered distribution resulting from fragmentation, it does not appear to be resilient to stochastic events (e.g., drought, severe storms). The Service believes that these combined factors have likely reduced the reproductive success of lesser prairie-chickens, possibly resulting in a loss of genetic variation and diversity, making the issue of the species' resiliency of greater concern. Conservation of the lesser prairie-chicken requires that each of the challenges be addressed.

Management Recommendations for Lesser Prairie-Chicken Conservation

In order to address the long-term conservation of the lesser prairie-chicken, the Service suggests implementation of four management goals to address the three primary challenges facing the species. The four management goals are described in detail below and include establishing strongholds, ensuring connectivity, committing to implementation, and providing long-term certainty.

Strongholds

To address the challenge of inadequate strongholds for the lesser prairie-chicken, the Service recommends that efforts are taken to establish strongholds throughout the species' occupied range. The Service suggests that a minimum of four strongholds be established initially across the landscape in order to ameliorate effects from current and future fragmentation and to increase the chances for long-term survival of the lesser prairie-chicken. Cooperation of private landowners is crucial to conservation of the lesser prairie-chicken, especially in regards to stronghold establishment, because about 95 percent of the occupied range occurs on private land. Within the occupied range of the lesser prairie-chicken, precipitation varies from west to east, temperature varies from north to south, and vegetation type varies from both west to east and north to south. Due to this variability, the Service views the species' occupied range as a matrix comprised of four primary quadrants, each one exemplifying a unique combination of precipitation, temperature, and vegetation type variables. These four quadrants are separated from east to west by the boundary between Bird Conservation Regions 18 (shortgrass prairie) and 19 (central-mixed grass prairie) and from north to south by the Canadian River. To ensure redundancy, resiliency, and representation across the species' range, the Service recommends at least one lesser prairie-chicken stronghold be established and maintained in each quadrant; however, an undetermined number of additional strongholds will be necessary across the species' range in order to expand, connect, and/or re-connect local populations to ensure survival and long-term population viability, as informed by current and future spatial habitat modeling efforts. The distribution, location, and number of strongholds necessary for lesser prairie- chicken conservation must be informed by population goals.

What Constitutes a Lesser Prairie-Chicken Stronghold?

The components of a stronghold must be defined within the context of a short-term conservation strategy stipulating immediate needs. As stated above, the Service recommends the prompt

establishment of at least four strongholds distributed across the landscape as informed by population goals in order to reduce the risk of extinction in the short term. The establishment of lesser prairie-chicken strongholds requires spatial consideration, temporal consideration, adequate jurisdiction, biological security, and management certainty.

The Service suggests that, in order to provide for viable lesser prairie-chicken populations, potential stronghold sites are a minimum of 25,000 acres in size but may need to be up to 50,000 acres or more. For a stronghold to serve its biological function and foster reproductive success, the available literature suggests that a viable lesser prairie-chicken population may require at least six to ten leks and a minimum of six males per lek (Applegate and Riley 1998, p. 14). The size of a potential stronghold may vary according to the amount and distribution of non-habitat and otherwise suitable habitat; the habitat quality of the area; and the interactions between non-habitat, otherwise suitable habitat, and suitable habitat. Non-habitat is defined as areas entirely avoided by lesser prairie-chickens (e.g., irrigated croplands), whereas otherwise suitable habitat consists of areas that contain features causing an indirect loss of lesser prairie-chicken use (e.g., vertical structures). The Service believes that as the quality of habitat increases, the size of the stronghold can decrease toward the minimum size requirement. For example, a 25,000-acre patch would meet the definition of a stronghold only if the entire area consists of high-quality grassland and shrubland habitat. The diversity of native grasslands and shrublands as appropriately defined by the ecological site descriptions is another factor that contributes to habitat quality. Alternatively, factors that minimize habitat quality and necessitate a larger sized patch for a potential stronghold include the amount and type of agricultural lands (small grains, cotton, etc.), presence of vertical structures, and distribution of roads, for example. Specifically, patches consisting of less than 65 percent high-quality native grasslands may be incapable of supporting viable lesser prairie-chicken populations and would not meet the definition of a stronghold (Crawford and Bolen 1976, p. 102); therefore, the size of a particular stronghold should be influenced by the amount of non-habitat or otherwise suitable habitat encompassed by the potential stronghold, as mentioned above.

In addition to these size requirements, strongholds must have long-term protection in place to address the species' relatively short life span, low nest success, high annual mortality, low recruitment, and high juvenile mortality. In the context of the lesser prairie-chicken, 10 to 15 year timeframes may be too short a period due to the species' life-history traits. In Kansas, implementation of the CRP has resulted in favorable habitat conditions for the lesser prairie-chicken due to landscape scale planting of native grasses (and forbs) thereby allowing for lesser prairie-chicken expansion and reoccupation of 16 counties north of the Arkansas River (Service 2010). This management has been beneficial for the lesser prairie-chicken population as a whole, but long-term certainty regarding protection of native habitat strongholds is recommended in order to ensure future survival and conservation of the species. Furthermore, most "split estate" lands, where surface rights and mineral rights are in different ownership, will not meet the definition of a stronghold. Both surface and mineral rights as well as best management practices must be addressed appropriately in order to avoid future developments that could reduce the quality of the stronghold.

A stronghold must also be secure in its biological function due to the lesser prairie-chickens' lek mating system. Leks are characterized by sparse vegetation and are generally located on elevated

features such as ridges or grassy knolls (Giesen 1998, p. 4). Giesen (1998, p. 9) reported that hens typically nest and rear broods within 3 km (1.7 mi) of leks and nest near a lek other than the one on which they mated. Therefore, a stronghold must provide a variety of habitat components to serve its biological function. Lastly, an area will not constitute a stronghold unless there is a high level of certainty that the quantity and quality of the habitat within the site will be maintained or improved.

Connectivity

In addition to the Service's recommendation to establish strongholds that meet the criteria above, the Service also suggests that efforts be implemented to establish connectivity among strongholds in order to provide for lesser prairie-chicken conservation. Many grouse species are known to be relatively poor dispersers. Most seasonal movements of lesser prairie-chickens are less than 10 km (6.2 mi), but Jamison (2000, p. 107) thought that dispersal movements as large as 44 km (27.3 mi) might occur in fragmented landscapes. The species requires sufficient suitable habitat corridors to facilitate movement among strongholds and to allow for gene flow. The location of these connection corridors should be informed by spatial habitat modeling efforts.

Implementation

The third management component that would assist in lesser prairie-chicken conservation is a commitment to implementation of management strategies that avoid or reduce ongoing habitat fragmentation in conjunction with the establishment of strongholds and connective corridors. To accomplish this goal, the Service encourages all stakeholders to assist in the development of a collaborative system that would target and prioritize appropriate areas for the establishment of strongholds and connective corridors as previously discussed. In addition, the Service encourages industry to plan for new energy and transmission developments to occur outside of strongholds and connective corridors identified through the stakeholder collaborative targeting system. Within strongholds and connective corridors, the Service recommends that habitat improvement and restoration are a priority. Management strategies to accomplish this goal may include the removal of vertical structures causing structural fragmentation and the restoration of croplands to native grasslands to reduce spatial fragmentation. The Service suggests monitoring data of lesser prairie-chicken populations and species' habitat be used for an adaptive management framework as lesser prairie-chicken conservation efforts are implemented on the ground.

Certainty

A fourth management goal that would provide lesser prairie-chicken conservation is that a high level of certainty that mechanisms will be in place to achieve and sustain the necessary habitat for the creation, maintenance, and conservation of strongholds and connective areas in the long term. Two tools offered by the Service to accomplish this goal are Candidate Conservation Agreements (CCA) for Federal agencies and Candidate Conservation Agreements with Assurances (CCAA) for non-Federal entities including private landowners and/or operators on non-Federal lands. In addition, the NRCS through the Lesser Prairie-Chicken Initiative is working with landowners to enhance, restore, and protect habitat using voluntary conservation practices. Voluntary initiatives and agreements such as these provide landowners and developers with the opportunity to implement conservation practices along with assurances that, if the species is listed, they can continue to manage their land as outlined in their agreements with no additional requirements.

The Service recommends implementation of all four management components in order to ensure the long-term conservation of lesser prairie-chickens. The Service believes that combined implementation of these management strategies may assist in the establishment of viable lesser prairie-chicken populations, ensuring long-term survival.

Moving Forward with Lesser Prairie-Chicken Conservation

The Service recognizes the significant efforts of our partners over the years to conserve the lesser prairie-chicken; it is of upmost importance that these efforts and the momentum towards conservation continue. We also applaud the current effort to develop a range-wide conservation strategy. The Service greatly appreciates the opportunity to provide input on what we believe are the key strategies (strongholds, connectivity, implementation and certainty) for lesser prairie-chicken conservation.

With this in mind, we strongly recommend our partners consider and apply the suggested management strategies to ensure the ongoing conservation of the lesser prairie-chicken. As the understanding of lesser prairie-chickens continues to grow, the Service expects to refine these suggested management strategies. We urge our partners to incorporate these strategies in the current planning effort recognizing that refinements will be considered as new information becomes available. We stand ready to work in collaboration and cooperation with our Federal, state, and private partners in this ongoing effort to conserve the lesser prairie-chicken.

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