Candidate Conservation Agreement

for the

Lesser Prairie-Chicken
(*Tympanuchus pallidicinctus*)

and

Sand Dune Lizard
(Sceloporus arenicolus)

In New Mexico

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Developed cooperatively by:
U.S. Fish and Wildlife Service
U.S. Bureau of Land Management
Center of Excellence for Hazardous Materials Management

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Executive Summary

In 1995, the U.S. Fish and Wildlife Service (FWS) was petitioned to list the lesser prairie-chicken (*Tympanuchus pallidicinctus*) (LPC) as threatened under the authority of the Endangered Species Act of 1973, as amended. The FWS ruled that listing of the LPC was warranted but precluded because of other higher priority species. The LPC was then designated as a candidate for listing as threatened in 1997. Similarly, in 2001, the FWS determined listing was warranted but precluded for the sand dune lizard (*Sceloporus arenicolus*) (SDL), formally known as the dunes sagebrush lizard, and it was designated as a candidate for listing as threatened.

This Candidate Conservation Agreement (CCA) for the LPC and the SDL represents a collaborative effort between the FWS, the Bureau of Land Management (BLM), and the Center of Excellence for Hazardous Materials Management (CEHMM). The CCA builds upon the BLMs "Special Status Species Resource Management Plan Amendment" (RMPA) (completed in April 2008) for southeast New Mexico. The RMPA established the foundational requirements that will be applied to all future Federal activities, regardless of whether a permittee or lessee participates in this CCA. The strength of the CCA comes from the implementation of additional conservation measures that are additive, or above and beyond those foundational requirements established in the RMPA.

The CCA is a voluntary agreement administered by CEHMM and with Participating Cooperators. Certificates of Participation (CPs) will be issued by CEHMM pursuant to this CCA in order to facilitate the voluntary cooperation of the oil and gas industry, livestock producers, and other interested stakeholders, thereby providing conservation benefits to the LPC and/or the SDL. When fully implemented, it will provide guidance for the conservation and management of the LPC and/or SDL, by reducing and/or eliminating threats to these species. Participating Cooperators will implement conservation measures and contribute funding for conservation as part of their CPs. Funds contributed as part of this CCA may or may not be used on the enrolled property since other habitat areas may be a higher priority for implementation of conservation measures. The conservation measures implemented by Participating Cooperators would generally consist of habitat restoration and enhancement activities aimed at reducing/and or eliminating current threats to the species.

This CCA/Candidate Conservation Agreement with Assurances (CCAA) (CCA/CCAA) is based on adaptive management principals and thus, is a living document. Using adaptive management principals, the FWS and/or the BLM can add or make necessary modifications to existing conservation measures currently found in this CCA/CCAA. Additionally, new conservation measures can be implemented if the FWS and/or the BLM find such measures to be necessary to facilitate the continued conservation of the LPC and/or SDL. Any adaptive management modifications will apply only to future CPs. It is also important to note that the CCA is the parent document for the CCAA, which addressed non-Federal lands.

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I. INTRODUCTION

If and when a species becomes listed under the Endangered Species Act of 1973 (ESA), as amended (16 U.S.C. § 1531, *et seq*.), that action triggers both a regulatory and a conservation responsibility for Federal, State, and private landowners. These responsibilities stem from section 9 of the ESA that prohibits "take" (i.e., harass, harm, pursue, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct) of listed species. Along with the section 9 prohibitions, Federal agencies must ensure that their actions will not jeopardize the continued existence of the listed species.

In the western Unites States many species that are candidates for listing under the ESA occur on both Federal and non-Federal lands. Non-federal property owners whose operations may have impacts on candidate species on private lands sometimes have the opportunity to voluntarily enter into a Candidate Conservation Agreement with Assurances (CCAA) in order to implement conservation measures aimed at reducing and/or eliminating threats to candidate species and to ensure that their land operations can continue unaffected if the species is listed in the future. However, property owners whose operations rely on using a combination of land ownership types (i.e., Federal and non-Federal) are concerned that assurances provided to them under a CCAA do not apply to Federal lands, even if they implement conservation measures across all land ownership types where they operate. These property owners, as well as Federal lessees/permittees, are seeking greater certainty that if they implement conservation measures to enhance the habitat of candidate species, any yet listing occurs, they would not be required to change their activities on Federal lands in a way that could significantly impact their operations. In New Mexico, property owners, Federal lessees and permittees, the U.S. Fish and Wildlife Service (FWS), and the Bureau of Land Management (BLM) were concerned about activities on public/Federal lands that might affect the status of two candidate species, the lesser prairie-chicken (*Tympanuchus pallidicinctus*) (LPC) and the sand dune lizard (*Sceloporus arenicolus*) (SDL), formally known as the dunes sagebrush lizard.

As a result of these concerns, in January 2003, a working group composed of local, State and Federal officials, along with private and commercial stakeholders, was formed to address conservation and management activities for the LPC and SDL. This working group, formally named the New Mexico Lesser Prairie-Chicken/Sand Dune Lizard Working Group, worked diligently for 2.5 years resulting in the publication of the *Collaborative Conservation Strategies for the Lesser Prairie-Chicken and Sand Dune Lizard in New Mexico* (Strategy) in August 2005. This Strategy provided guidance in the development of BLMs Special Status Species Resource Management Plan Amendment (RMPA), approved in 2008, which also addresses the concerns and future management of LPC and SDL habitats on BLM lands. Both plans prescribe active cooperation among all stakeholders to reduce and/or eliminate threats to these species in New Mexico. As an outcome, the land use prescriptions contained in the RMPA now serve as baseline mitigation (for both species) to those operating on Federal lands or non-Federal lands with Federal minerals.

This Candidate Conservation Agreement (CCA) between the FWS, BLM, Center of Excellence for Hazardous Materials Management (CEHMM), and Participating Cooperators will address the conservation needs of the LPC and SDL in New Mexico. Through this CCA, CEHMM will

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work with Participating Cooperators who voluntarily commit to implementing or funding specific conservation actions that will reduce and/or eliminate threats to these species. CEHMM is a 501(c)(3) organization, established in 2004, that is dedicated to cutting edge applied research programs, community support, education, and cooperative conservation. Flagship projects include participation in the recovery and conservation of listed and candidate species.

The CCA will provide a mechanism for implementing and monitoring conservation measures that are not explicitly addressed in or applicable to the RMPA. Any conservation measures undertaken by Participating Cooperators as a result of this CCA are measures above and beyond those prescribed in the RMPA. A future decision to list either species would take into consideration actions planned and/or implemented pursuant to this CCA as well as land use prescriptions contained in the RMPA. However, such a decision would also need to consider threats facing the LPC and SDL now and into the foreseeable future throughout all or a significant portion of their current range. Since this CCA is designed to address the activities of lessees and permittees on Federal lands, a companion CCAA will also be used to address the needs of both species on State and private lands within New Mexico.

Benefits of this CCA

The most significant benefit of this CCA is that it will guide conservation actions for the LPC and SDL in order to improve the status of these species within New Mexico. In comparison to well-intentioned, but uncoordinated conservation efforts, this CCA provides a comprehensive and strategic landscape level approach to addressing the conservation needs of the LPC and SDL. Although the FWS cannot absolutely guarantee that listing will never be necessary, this CCA seeks to implement conservation measures on Federal lands, which, when combined with those benefits that would be achieved if conservation measures in the CCAA are implemented, would preclude or remove any need to list the LPC and SDL.

This CCA is designed to include conservation measures that reduce and/or eliminate threats, on Federal lands. If enough Participating Cooperators on non-Federal lands implement conservation measures through their participation in the CCAA, the likelihood that the species will be listed will be greatly reduced. The implementation of conservation measures through the CCA and CCAA combined make it much less likely that lessees and permittees will bear additional conservation burdens on Federal lands. Again, this high degree of certainty that no additional conservation measures will be required of Participating Cooperators would result from their implementation of conservation measures listed in this CCA, which are specifically designed to reduce and/or eliminate threats to the LPC and SDL.

In the event either species is listed, incidental take coverage provided by the section 7 conference opinion (see discussion below) for conservation actions undertaken on Federal lands would become effective. This coverage, provided in advance of any possible listing, will serve to protect Participating Cooperators from additional disruption should one or both species become listed.

CCA Relationship to Section 7 of the ESA

Although not required by the ESA, at the early planning stage the FWS will conduct a section 7 "conference opinion" pursuant to section 7(a)(4) of the ESA to identify and resolve potential conflicts between the proposed action (in this case the Federal actions are: this agreement between two Federal agencies and a non-governmental entity; and the potential issuance of a

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section 10(a)(1)(A) permit for the attendant CCAA, should either species be listed at some time in the future) and the two candidate species. Any Federal agency has the option of conducting a 7(a)(2) conference for non-listed species to ensure that the actions they authorize, fund, permit, or carry out are not likely to jeopardize the existence of those species. The FWS supports a proactive approach to conserving candidate species, which may reduce and/or eliminate the need for future protection under the ESA.

The FWS will issue a section 7 conference opinion analyzing the potential effects to the LPC and SDL from the proposed action and the implementation of conservation measures as identified in this CCA. A decision to list either of the species covered by this CCA would be based on the five factor threats analysis required under the ESA. However, the effects of the overall CCA and its components would be considered in the listing determination. Should either species covered under the conference opinion become listed, the FWS would review the conference opinion in coordination with BLM. If no significant changes have been made in the CCA or other information used in the conference opinion, the FWS would confirm the conference opinion (as is) as the biological opinion and include an incidental take statement (required for the biological opinion). It is the goal of this CCA to ensure adequate conservation measures, sufficient adaptive management, and monitoring obligations to allow the conference opinion to be converted into a biological opinion on the effective date of any decision to list the LPC and/or SDL.

II. PURPOSE OF THE CCA

The primary purpose of this CCA is to:

- develop, coordinate, and implement conservation actions to reduce and/or eliminate known threats to the LPC and SDL within the current and historic range of both species in New Mexico,
- support ongoing efforts to establish/re-establish and maintain viable populations of both species in currently occupied and suitable, but currently unoccupied habitats,
- serve as a landscape-scale umbrella document for conservation measures implemented by CEHMM and Participating Cooperators,
- encourage development and protection of suitable LPC and SDL habitat by giving Participating Cooperators incentives to implement specific conservation measures (as described in their CP), and
- provide Participating Cooperators a high degree of certainty that the conservation measures agreed to in the CP would be considered in the biological opinion, and thus, would reduce the likelihood of additional land use restrictions to Participating Cooperators that might otherwise apply should the LPC and/or SDL become listed.

III. AUTHORITY

Sections 2, 7, and 10 of the ESA allow the FWS to enter into this CCA with other cooperating partners. Section 2 of the ESA states that encouraging interested parties, through Federal financial assistance and a system of incentives, to develop and maintain conservation programs is a key to safeguarding the Nation's heritage in fish, wildlife, and plants. Section 7 of the ESA requires the FWS to review programs it administers and utilize such programs in furtherance of

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the purposes of the ESA. By entering into this CCA, the FWS is utilizing its authority to enter into this type of agreement to further the conservation of the Nation's fish and wildlife resources. Lastly, should either species become listed, section 10(a)(1)(A) of the ESA authorizes the issuance of permits to "enhance the survival" of a listed species.

Additionally, the Federal Land Policy and Management Act (FLPMA, Section 307, 43 USC 1737), which provides overall direction to the BLM for conservation and management of public lands, allows the BLM to participate in conservation agreements. The BLM manual, Section 6840 ("Special Status Species Management") provides overall policy direction to BLM managers to conserve listed threatened or endangered species on BLM administered lands, and to assure that actions authorized on BLM administered lands do not contribute to the need to list species deemed by the BLM to be "sensitive." Finally, the BLMs "Guide to Agreements" notes that "Cooperative Management Agreements" are typically long-term agreements with other parties interested in joint management of wildlife habitats or other areas.

IV. SPECIES INVOLVED

Lesser Prairie-Chicken

The LPC 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 elaborate breeding behavior. Plumage of the LPC is characterized by a cryptic pattern of alternating brown and buff-colored barring, with body length ranging from 38-41 centimeters (cm)(15-16 inches (in)) (Johnsgard 1973). LPC average body mass is 752 grams (g) for males and 712 g for females (Giesen 1998). Males have long tufts of feathers on the sides of the neck that are erected during courtship displays. Males also display brilliant yellow supraorbital eyecombs and reddish esophageal air sacs during courtship displays (Copelin 1963; Johnsgard 1983).

LPCs are polygynous and exhibit a lek mating system. Males gather to display on leks at dusk and dawn beginning in late February and extending through early May (Copelin 1963; Hoffman 1963; Crawford and Bolen 1976). Dominant older males occupy the center of the lek, while younger males occupy the periphery and compete for central access (Ehrlich et al. 1988). Females arrive at the lek in early spring; peak hen attendance at leks is during mid-April (Copelin 1963; Haukos 1988). The sequence of vocalizations and posturing by males, often described as "booming, gobbling, yodeling, bubbling, or duetting," has been described by Johnsgard (1983) and Haukos (1988). After mating, the hen selects a nest site, usually 1-3 kilometers (km) (0.6-2 miles (mi)) from a lek (Giesen 1994a), and lays an average clutch of 10-14 eggs (Bent 1932). Second nests attempts may occur when the first attempt is unsuccessful. Incubation lasts 23-26 days and young leave the nest within hours of hatching (Coats 1955). Nest failure is prevalent during extended periods of drought. For example, nest success was 54 percent (7 of 13 nests hatched) in New Mexico during a year of average precipitation, but it was zero percent (out of 11 nests zero nests hatched) during a year of severe drought (Merchant 1982). Broods remain with females for 6-8 weeks. LPCs have a relatively short life span and high annual mortality. Campbell (1972) estimated a 65 percent annual mortality rate and a 5-year maximum life span, although one individual nearly 7 years old has been recently documented in the wild (Wolfe et al. 2004). Giesen (1998) provides a comprehensive summary of LPC breeding behavior, habitat, and phenology.

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The historic range of the LPC encompassed habitats with sandy soils supporting shinnery oak (*Quercus harvardii*)-bluestem (*Andropogon* sp.) and sand sage (*Artemisia filifolia*)-bluestem communities in the high plains of southeastern Colorado, southwestern Kansas, western Oklahoma, west Texas, the Texas panhandle, and eastern New Mexico (Bailey 1928). In New Mexico, Ligon (1961) reported the historic range as being the sandhill-bluestem plains, an approximately 120 km (75 mi) wide swath from the northeast border with Colorado to the southeast border with Texas and in northern De Baca County to 48 km (30 mi) west of Ft. Sumner.

In the early twentieth century, LPCs were reportedly common throughout their five-state range (Bent 1932; Baker 1953; Sands 1968; Fleharty 1995). The area occupied by the LPC in the 1880s was first estimated as 358,000 square kilometers (km^2) (138,225 square miles (mi^2)), and by 1969 it had declined to an estimated 125,000 km^2 (48,263 mi^2) due to wide-scale conversion of native prairie to cultivated cropland (Taylor and Guthery 1980; Aldrich 1963). In 2007, mapping efforts by the Colorado Division of Wildlife, Kansas Department of Wildlife and Parks, New Mexico Department of Game and Fish (NMDGF), Oklahoma Department of Wildlife Conservation, and Texas Parks and Wildlife Department, in cooperation with the Playa Lakes Joint Venture, re-estimated the pre-settlement occupied range to be approximately 456,403 km^2 (176,218 mi^2)(Playa Lakes Joint Venture 2007). Although LPC still occur at some level within each state (Giesen 1998), based on these estimates, the species' distribution has been reduced nearly 86 percent since the time of European settlement (Playa Lakes Joint Venture 2007). The increase in the amount of LPC occupied range since 1980, as previously reported by Taylor and Guthery (1980), is primarily attributable to the short-term expansion of native grassland habitat in Kansas and Colorado under the Conservation Reserve Program (CRP) (Rodgers and Hoffman 2005).

In the 1920s and 1930s, the former range of the LPC in New Mexico was described as all of the sandhill rangeland of eastern New Mexico as far west as De Baca County. Ligon (1927) mapped the breeding range as encompassing portions of seven counties, a small subset of what he described as former range. In the 1950s and 1960s, occupied range was more extensive, indicating reoccupation of some areas. Presently, the NMDGF reports that LPCs are known from portions of seven counties and the occupied range of the LPC in New Mexico is estimated to encompass approximately 5,698 km^2 (2,200 mi^2) (Davis 2006) compared with its historic range of 22,390 km^2 (8,645 mi^2). Private and State land supports approximately 40 percent of the LPC population in New Mexico, with the remaining occurring on lands managed by BLM (Davis 2006). In the 1950s, the LPC population was estimated at 40,000 to 50,000 individuals, but by 1972 the population had declined to an estimated 6,000 to 10,000 individuals. NMDGF currently estimates the LPC statewide population to be about 9,443 individuals (Beauprez 2008).

In New Mexico, the most recent LPC population decline began in 1989. LPC counts on leks dropped dramatically in the BLM Caprock Wildlife Habitat Management Area and in west-central Lea County (Smith et al. 1998). Estimated hunter harvest also declined sharply (Cowley 1995), resulting in closure of hunting seasons in New Mexico in 1996. Although the decline may have been precipitated by drought conditions and reduced nest success, it is also likely that population recovery during the drought was hampered by habitat fragmentation and low recruitment. Since 2005, weather conditions have improved resulting in population increases, and Federal and State agencies have focused staff time and funding to address habitat concerns. From 1998-2008 LPC populations within the core area of southern Roosevelt, northern Lea, and

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eastern Chaves counties have increased (Beauprez 2008). The LPC population south of U.S. Highway 380 in southeastern Chavez County has shown a significant decline over the same ten-year period, even though 5 leks were detected in 2008, the largest number of leks detected since 1998 (Beauprez 2008). The BLM has implemented stipulations and conditions of approval to conserve LPC habitats since the 1980s. Along with its partners, the BLM has also been implementing legacy oilfield reclamation and rangeland restoration programs to enhance LPC habitat.

Sand Dune Lizard

The SDL is native to a small area of southeastern New Mexico and west Texas. A habitat specialist, the SDL only occurs in sand dune complexes associated with shinnery oak (Degenhardt et al. 1996), with areas often separated by large stretches of unsuitable habitat.

A history of oil and gas development and shinnery oak removal for grazing within suitable habitat, including dunal complexes, has increased fragmentation of SDL habitat. This fragmentation, within a small and possibly shrinking geographic range, has led to concern over the future survival of the species and a petition was submitted to the FWS on June 6, 2002 for the protection of the species under the ESA. Prior to receiving the petition to list, through its own internal process, the FWS determined in 2001 that listing was warranted, but precluded because of other higher priority species and the SDL was designated as a candidate for listing. Since 2001, BLM has been actively implementing lease stipulations and conditions of approval for permits to conserve SDL habitat in New Mexico. Additionally, the BLM is actively providing education and outreach to users of the public land regarding SDL habitat needs, including the importance of shinnery oak in maintaining its habitat.

The SDL prefers active and semi-stabilized sand dunes associated with shinnery oak and scattered sandsage. The oaks provide dune structure, shelter, and habitat for the species' prey base. SDLs are found in large dunes with deep, wind hollowed depressions called blowouts, where they remain under vegetation or loose sand during the hot part of the day and at night. These large, deep dunal blowouts (greater than 3 m deep and 32.9 m long) provide superior habitat with more area for cover (for thermoregulation and predator avoidance) and steeper slopes needed as breeding habitat. SDLs avoid shallow blowouts.

Sand grain size is also important when determining which areas within the species' range SDLs will be found. Using laboratory and field experiments to determine sand grain preference, it was determined that SDLs select sites with more medium sand grains (250-354 micrograms (µm)) and do not use less course (fine and extra fine grain) sands, perhaps because it inhibits respiration when SDLs bury themselves in order to avoid predators or regulate their temperature (Fitzgerald et al 1997). The landscape created by the shinnery oak sand dune community is a spatially dynamic system. Areas that contain components of suitable (large, deep blowouts with preferred grain size, steepness, and cover to support populations of SDL) will not always provide suitable habitat. With natural processes like wind and rain, areas that are currently shinnery flats could build into dune complexes that support SDLs. The movement of this dynamic system could be interrupted by habitat fragmentation that would stop the natural shift in dunes and cause the current dune structures to collapse. For this reason, the establishment of corridors is critical to maintaining the dynamic nature of this system.

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SDLs are active between April and October during optimal temperatures (Sartorius et al 2002). Females can reach sexual maturity during their first spring following hatching and produce one to two clutches per year, each averaging 4-5 eggs. Hatchlings emerge between July and September. The species feed on ants, small beetles, crickets, grasshoppers, and spiders. Most feeding takes place within or adjacent to patches of vegetation, usually shinnery oak habitat. Individuals are diurnal and wary, and will seek protection and shelter in burrows, under the sand, beneath leaf litter, and under the shinnery oak canopy (BLM 2006). Within a dune complex, the shinnery flats between dune blowouts are used for movement by females seeking nesting sites and for dispersal of recent hatchlings (Painter 2007). Therefore, it is imperative that connectivity be considered across interdunal areas.

SDLs are known only from a system of shinnery oak sand dunes located in southeastern New Mexico and west Texas. In New Mexico, the habitat area encompasses only 455,000 acres (711 mi^2) of BLM, State of New Mexico Land Office (NMSLO), and private lands. The species range in New Mexico consists of 71,396 acres of State trust lands, 286,355 acres of public lands managed by BLM, and 97,025 acres of private property. Seventy-one percent of the minerals within the range of the SDL are federally owned and fall under BLM lease stipulations and their RMPA. Within the geographic range of the species, habitat is localized and fragmented where known populations are separated by vast areas of unoccupied habitat. Fitzgerald et al. (1997) observed isolated areas of apparently suitable habitat that did not contain SDLs. It is possible that these observations are the result of local extinction events in isolated areas where recolonization is either impossible or has not yet occurred (Snell et al. 1997). It is also possible that these areas have never been occupied and other factors such as competition with or predation by other species prevent SDL occupation in otherwise suitable habitat. Recent surveys by the BLM have reconfirmed the presence of SDLs within the known geographic range of the species. The BLM has also developed a habitat predictability model to help redefine the parameters of the known geographic range. Several SDLs have been located just outside of the known geographic range, but within shinnery dune habitat, and have included juveniles, indicating that more individuals were likely present (Bird 2007). In Texas, land ownership within the range of the SDL is currently unquantified, but initial research has indicated that both private and State-owned lands contain suitable habitat for the species in west Texas (Laurencio et al. 2006). At this time, a range-wide population estimate for the SDL has not been calculated (C. Painter, New Mexico Department of Game and Fish, pers. comm. 2007).

V. THREATS

Section 4(a)(1) of the ESA lists five factors that must be considered when determining if a species should be listed as threatened or endangered. A species may be listed due to one or more of these factors. These include:

(A) present or threatened destruction, modification, or curtailment of its habitat or range;
(B) over-utilization for commercial, recreational, scientific, or educational purposes;
(C) disease or predation;
(D) inadequacy of existing regulatory mechanisms; and
(E) other natural or manmade factors affecting its continued existence.

Lesser Prairie-Chicken

A. Loss, Destruction, Modification, or Fragmentation of Habitat

Much of the suitable LPC habitat across the species historic multi-state range has been lost due to a conversion to agriculture or modified through grazing practices and other factors (Crawford 1980; Braun et al. 1994). Direct conversion of rangeland to other land uses is the most prevalent cause of LPC habitat fragmentation throughout its range. Other sources of impact on the structure and continuity of grassland habitats include the construction of the infrastructure associated with oil and gas extraction and wind farm development.

Impacts from Land Conversion to Agriculture

Prairie grouse require large expanses of unfragmented, ecologically diverse native rangelands to complete their life cycles (Flock 2002). Intact landscapes of mixed-grass, shortgrass, and shrubland habitats are essential to the LPC (Giesen 1998; Bidwell et al. 2002). Conversion of native sandsage-shinnery oak rangeland to cultivation is an important factor in the decline of LPC populations (Copelin 1963; Jackson and DeArment 1963; Crawford and Bolen 1976; Crawford 1980; Taylor and Guthery 1980; Braun et al. 1994; LPC Interstate Working Group 1997). Landscapes having greater than 20 to 37 percent cultivation may not support stable LPC populations (Crawford and Bolen 1976). In the 1940s, 1970s, and 1980s, additional acres of previously unbroken grassland were brought into cultivation (Laycock 1987). Bragg and Steuter (1996) estimated that by 1993, only 8 percent of the bluestem-grama association and 58 percent of the mesquite-buffalo grass association as described by Kuchler (1985) remained. When considered State-wide, each of the five states with extant LPC populations showed a decline in the amount of rangeland acreage over that time period, indicating that loss of important LPC habitat may still be occurring.

The U. S. Department of Agriculture's Conservation Reserve Program (CRP) was initiated in the National Food Security Act of 1985, as amended (Farm Bill), and since that time has resulted in millions of acres of marginal and highly erodable cropland returned to grassland, shrubland, and forest habitats (Riffell and Burger 2006), much of which is used by LPCs. Lands enrolled into CRP grass cover support LPC populations in a significant portion of occupied range, particularly in Kansas where expansion of the LPC population is directly related to the amount of land enrolled in CRP planted to a native grass mix. The importance of CRP habitat to the survival of the LPC was recently emphasized by Rodgers and Hoffman (2005). CRP grasslands are often the only ungrazed or lightly grazed component of existing landscapes accentuating their importance to the species for nesting, thermal, and escape cover. In total, approximately 8,760 km^2 (2,163,087 ac; 3,382 mi^2) of CRP within the occupied range of the LPC is under potential imminent threat of being returned to agricultural production. Although it is unlikely that LPCs occupy all CRP tracts within all counties with existing LPC populations, the FWS is only able to analyze the LPC occupancy of CRP tracts at the county level. Nonetheless, the county level CRP projections are a good indicator of habitat trends within occupied portions of counties. The projected CRP loss within two years in all occupied counties of all states amounts to approximately 14 percent of the total occupied range, based on the most recent estimates of the LPC's current range. In New Mexico, approximately 578,832 acres of CRP lands are potentially available to the LPC, of which only 57,883 acres are comprised of native grasses (Playa Lakes Joint Venture 2008).

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Impacts from Livestock Grazing

Grazing is one of the dominant land uses on public and private lands throughout the range of LPCs. The evolutionary history of the mixed-grass prairie resulted in endemic bird species adapted to a mosaic of lightly to heavily grazed areas (Bragg and Steuter 1996; Knopf and Samson 1997). Grazing by wildlife or domestic livestock is essential to maintain the health of native grasslands and moderately and lightly grazed areas are necessary on a landscape scale to maintain LPC habitat (Davis 2006). In some areas within LPC range where heavy grazing has removed tallgrass and midgrass cover, insufficient amount of lightly grazed habitat is available to support successful nesting (Jackson and DeArment 1963; Davis et al. 1979; Crawford 1980; Taylor and Guthery 1980; Davies 1992). Uniform or widespread livestock grazing of rangeland, to a degree that leaves less than adequate residual cover remaining in the spring, is considered detrimental to LPC populations because grass height is reduced below that necessary for secure nesting cover and desirable food plants are markedly reduced (Bent 1932; Davis et al. 1979; Crawford 1980; Bidwell and Peoples 1991; Riley et al. 1992; Giesen 1994b). Residual cover at and around nests is thought to increase nest success because the nest is better concealed from predators (Davis et al. 1979; Wisdom 1980; Riley et al. 1992; Giesen 1994b).

The impacts of grazing on LPC habitat can vary widely, depending on climatic conditions, the state or health of range vegetation, and the type of grazing regime utilized. Drought tends to magnify grazing impacts, as both processes reduce plant cover (Giesen 2000). When forage is reduced by drought, what remains tends to be grazed more heavily unless animal numbers are reduced. As a result, some grazed areas may supply adequate habitat during periods of normal rainfall, but may be unable to support LPCs during periods of drought (Merchant 1982). Intensive and/or persistent grazing may reduce or eliminate residual tallgrass cover needed for nesting (Davis et al. 1979; Riley et al. 1992). Heavy grazing that repeatedly interrupts plant succession over a broad area may result in the conversion of tallgrass prairie to shortgrass or forb-dominated habitat (Hoffman 1963; Jackson and DeArment 1963; Litton et al. 1994) or shrub-dominated landscapes.

Impacts from Alternative Energy Development

A rapid expansion of transmission lines and associated wind energy development throughout large portions of occupied LPC range is currently occurring. Except in New Mexico, wind energy development with its associated infrastructure is an on-going and increasing threat to nearly all occupied habitat in all states within the LPC's range where it threatens historical habitat important to linking the New Mexico population to populations to the north. However, little is known about how wind energy development will affect LPCs and their habitat. Construction of turbine towers and powerlines, turbine noise, and the movement of turbine blades during operation have the potential to disturb nesting LPCs (Robel et al. 2004). However, behavioral avoidance of these structures by prairie grouse has the potential to greatly increase the negative impacts in the project area. Effects resulting from habitat fragmentation may negatively affect local LPC populations by decreasing the area of habitat available for nesting and brood-rearing (Pitman et al. 2005). The behavioral response of the greater prairie-chicken is similar to that of the LPC and it has been predicted that nesting and brood-rearing hens of both species will avoid large wind turbines by at least a one-mile radius (Robel et al. 2004). Fragmentation and changes in habitat structure may increase the amount of edge, which may serve as travel lanes for terrestrial predators (Kuehl and Clark 2002), and are consequently avoided by nesting prairie grouse (Robel 2002; Pitman et al. 2005). In addition to the effects of habitat fragmentation,

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prairie grouse avoidance of vertical structures (Anderson 1969; Manes et al. 2002), and human disturbance activities may further impact LPC movements and habitat use (Robel 2002). Therefore, this type of land use change has the potential to negatively impact the LPC. Consequently, the BLM in its RMPA (2008), stated that applications to permit wither solar or wind energy in public lands within the RMPA planning area will not be approved unless the applicant can demonstrate that there will be no negative impacts to LPCs.

Impacts from Oil and Gas Development

Energy exploration and development occur on public and private surface lands throughout the range of the LPC in New Mexico. Although the effects of oil and gas development on LPCs are poorly understood, recent studies have suggested that development of oil and gas resources negatively impacts prairie grouse, particularly during the breeding season (Lyon and Anderson 2003; Pitman et al. 2005). Because LPCs require large contiguous tracts of prairie ecosystems to fulfill their life history requirements, the cumulative impacts of roads and increased traffic, well pads, pipelines, overhead transmission lines, compressor stations, and production facilities not only result in direct habitat loss, but in fragmention of remaining suitable habitat (Pitman et al. 2005). Prairie grouse avoid roads, power lines, and other man-made infrastructures (Pitman et al. 2005). Crawford and Bolen (1976) noted that LPC leks adjacent to heavily traveled roads were abandoned at a higher rate than those found further from anthropogenic disturbance. The effect of daily vehicular traffic associated with maintenance of oil and gas operations along these road networks can also impact breeding activities and may further decrease the availability of habitat (Braun et al. 2002). Collisions with overhead transmission lines cause direct mortality to LPCs and may further limit LPC populations (Bidwell et al. 2003). Transmission lines also provide perches for raptors, which could potentially increase the mortality rate of LPCs (Bidwell et al. 2003). Noise associated with oil field activities may impact breeding activities if mating display vocalizations are disrupted by background noise (Davis 2006). Braun et al. (2002) noted that sage-grouse lek attendance was lower on breeding grounds located in close proximity to active mineral resource developments compared to less disturbed lek sites. Braun (1986) speculated that if noises associated with oil field activity deter recruitment of yearling sage-grouse males to breeding grounds, leks may become extinct.

Studies to assess whether sounds from oil and gas exploration may have played a role in the abandonment of a number of historically active lek sites in southeast New Mexico show that abandoned lek sites were exposed to higher ambient noise levels than active sites (Hunt 2004). The same study also reports a significantly higher number of operating wells within one mile of abandoned lek sites. Whether this pattern of lek abandonment reflects sensitivity to noise or some other form of disturbance associated with intensive oil and gas development, or is a response to factors not associated with drilling, remains unknown. However, all of these studies emphasize the importance of taking behavioral avoidance into consideration when assessing development impacts on LPC habitat. The majority of these issues described above are addressed by the RMPA (BLM 2008), and timing stipulations have been in place since the implementation of the RMP in 1997 (BLM 1997).

Impacts from Habitat Fragmentation

Suitable habitat for LPCs has been lost due to conversion to agriculture and modified through grazing practices and other factors, such that remaining suitable habitat is increasingly fragmented and isolated (Crawford 1980; Braun et al. 1994). Fragmentation may threaten local LPC populations through several mechanisms: habitat juxtaposition and remaining patches of

rangeland may be smaller than necessary to support populations (Samson 1980); necessary habitat heterogeneity may be lost; habitat between patches may accommodate high densities of predators; and ability to move and/or disperse among suitable patches of habitat may decrease (Wilcove et al. 1986; Knopf 1996).

Direct conversion of rangeland to some other land use is the most extreme of several possible causes of fragmentation of LPC habitat. Other sources of impact on the structure and continuity of grassland habitats include infrastructure associated with resource extraction, roads, power lines, fences, buildings, and tree plantings or windbreaks. As a group, prairie grouse may be particularly sensitive to habitat fragmentation due to their short dispersal distances and landscape-scale habitat requirements (Braun et al. 1994). Recent LPC declines in the southern portion of its range in New Mexico, although probably at least in part drought-related, have led to concern over the effects of fragmentation caused by gas and oil exploration and drilling. While it is often difficult to describe cause-and-effect linkages between specific sources of fragmentation and eventual population responses, recent studies have found LPC population declines in New Mexico to be associated with several measures of overall habitat fragmentation, including patch size, edge density, and total rate of landscape change (Woodward et al. 2001; Fuhlendorf et al. 2002).

Impacts of fragmentation are cumulative and often are mediated by behavioral responses to whatever change is occurring on the land. A growing body of evidence suggests that LPCs actively avoid areas in proximity to vertical structures that may provide hunting perches for raptors, human activity, and noise, particularly during nesting (Robel et al. 2004). Studies have shown that prairie grouse, including LPCs, may avoid or nest at reduced rates in areas near roads, power lines, compressor stations, and inhabited dwellings (Braun et al. 2002; Lyon and Anderson 2003; Pitman 2003; Robel et al. 2004). Recent studies in Kansas showed that LPCs seldom nest or raise their broods within approximately 580 feet of oil or gas wellheads, 1,200 feet of electrical transmission lines, 2,600 feet of improved roads, and 4,000 feet from buildings (Robel et al. 2004; Pitman et al. 2005). Nest site avoidance at these distances effectively eliminates a large percentage of available nesting habitat. Thus, the presence of these man-made features may result in LPC abandonment of areas containing a high percentage of otherwise suitable habitat, effectively increasing the impact of these features far beyond their physical footprint.

LPC habitat loss and modification range-wide continues to occur due to human land use. Additionally, the continued loss and degradation of currently occupied habitat, in the form of heavy grazing, oil and gas development, and fragmentation are rendering portions of previously occupied range uninhabitable for the species. The loss of habitat, though addressed by RMPA measures (BLM 2008), will be reduced by the implementation of this CCA.

Mixed sand sagebrush and shinnery oak rangelands are well documented as preferred LPC habitats, and long term stability of shrubland landscapes has been shown to be particularly important to the species (Woodward et al. 2001). Consequently, herbicide application on native rangelands to decrease or eliminate the shrub component and increase grass forage for livestock reduces habitat quality for LPC throughout the species' range. Herbicide application (primarily 2,4-D and tebuthiuron) to reduce or eliminate shrubs from native rangelands is a common ranching practice throughout the species range

In a study conducted in west Texas, Haukos (1989) documented strong nesting avoidance of tebuthiuron-treated shinnery oak rangelands. Similar behavior was confirmed by three recent studies conducted in New Mexico that examined aspects of LPC habitat use, survival, and reproduction relative to shinnery oak density and herbicide application. First, Bell (2005) documented strong thermal selection for, and dependency of LPC broods on, sand shinnery oak dominance in shrubland habitats. In this study, LPC hens and broods used sites within the sand shinnery community that had statistically higher percent cover and greater density of shrubs.

In a second study, Johnson et al. (2004) observed through telemetry methods that the most common vegetation types in LPC hen home ranges were those dominated by shinnery oak. Hens were detected more often than randomly in or near pastures untreated with herbicides. Although hens were detected in both treated and untreated habitats in this study, 13 of 14 nests were located in untreated pastures, and all nests were located in areas dominated by shinnery oak. Areas immediately surrounding nests also had higher shrub composition than the surrounding pastures. This study suggested that herbicide treatment to control shinnery oak adversely impacted nesting LPC.

Finally, a third study conducted by the Sutton Center, in cooperation with the NMDGF, showed that over the course of four years and five nesting seasons, LPCs in the core of occupied range in New Mexico distributed themselves non-randomly among shinnery oak rangelands treated and untreated with tebuthiuron (Patten et al. 2005). They demonstrated statistically that LPCs strongly avoided habitat blocks treated with tebuthiuron, but were not affected by cattle grazing. Further, herbicide treatment explained nearly 90 percent of the variation in occurrence among treated and untreated areas.

B. Overutilization for commercial, recreational, scientific, or educational purposes

In the late 19th century, LPCs were subject to market hunting (Jackson and DeArment 1963). Harvest has been regulated since the turn of the 20th century (Crawford 1980). Currently, the LPC is classified as a game species in Kansas, New Mexico, Oklahoma, and Texas, although the legal harvest is now closed in New Mexico and Oklahoma. Overutilization through recreational hunting is not considered a main cause of LPC population declines. However, because most remaining LPC populations are now very small and isolated, and because they naturally exhibit a clumped distribution on the landscape, they are likely vulnerable to local extirpations through many mechanisms, including human harvest (Crawford 1980, Taylor and Guthery 1980). One new activity that has the potential to negatively affect individual LPC populations is the growing occurrence of bird watching by the public and guided tours, especially of leks during the breeding season. The site-specific impact of recreational observations of LPCs at leks is currently unknown. However, disturbance effects are likely to be minimal at the population level if disturbance is avoided by observers remaining in vehicles or blinds until LPCs naturally disperse from the lek and observations are confined to a limited number of days and leks. Solitary leks comprised of fewer than ten males are most likely to be affected by repeated recreational disturbance. Research is needed to quantify this potential threat to local populations of LPC (FWS 2008).

C. Disease or predation

Giesen (1998) reported no available information on ectoparasites or infectious diseases in LPCs, although several endoparasites, including nematodes and cestodes are known to infect the species. The Lesser Prairie-Chicken Interstate Working Group (1997) concluded that, while

density-dependent transmission of disease was unlikely to have a significant effect on LPC populations, a disease that was transmitted independently of density could have drastic effects. The avian reticuloendotheliosis virus (REV) is a viral disease documented in poultry, which has been found to cause considerable mortality in captive Attwater's prairie-chickens (*Tympanuchus cupido attwateri*) and greater prairie-chickens (*T. cupido*). In 1999 and 2000, researchers surveyed blood samples from 184 LPCs from three states to determine if REV was present in the species. However, all samples were negative, suggesting that REV may not be a serious problem for most wild populations of LPC (Wiedenfeld et al. 2002).

The impact of West Nile Virus (WNV) on the LPC is unknown. Ruffed grouse have been documented to harbor WNV infection rates similar to some corvids. For 130 ruffed grouse tested in 2000, all distant from known WNV epicenters, 21 percent tested positive. This was remarkably similar to American crows and blue jays (23 percent for each species), species with known susceptibility to WNV (Bernard et al. 2001). Recent analysis of the degree of threat to prairie grouse from parasites and infectious disease concluded that microparasitic infections that cause high mortality across a broad range of galliform hosts have the potential to extirpate small, isolated prairie grouse populations (Peterson 2004). Currently, CEHMM is conducting a regional assessment of WNV within the indigenous populations of Chihuahuan ravens (*Corvus cryptoleucus).* Ravens were chosen as environmental sentinels for this study due to their omnivorous/scavenging nature and susceptibility to avian pathogens such as the WNV. Many of the nesting areas currently being investigated overlap with the known occupied range of the LPC. Data collected during this investigation will be made available in the event that WNV becomes a suspect in any suspicious LPC population decline.

Prairie falcon (*Falco mexicanus*), northern harrier (*Circus cyaneus*), great-horned owl (*Bubo virginianus*), other unspecified raptors, and coyote (*Canis latrans*) have been identified as predators of LPC adults and chicks (Davis et al. 1979; Merchant 1982; Haukos and Broda 1989; Giesen 1994a). Predators of nests and eggs also include Chihuahuan raven, striped skunk (*Mephitis mephitis*), ground squirrels (*Spermophilus spp*), and bullsnakes (*Pituophis melanoleucus*), as well as coyotes and badgers (*Taxidea taxus*) (Davis et al. 1979; Giesen 1998). LPC predation varies in both form and frequency throughout the year, with raptor predation increasing during lek attendance (Wolfe et al. 2007). Although the FWS has found no information on disease in LPCs and impacts of predators on LPCs at various life stages, there is now indication that either of these factors have risen to the level that they threaten the continuing existence of the species.

D. The inadequacy of existing regulatory mechanisms

In 1973, the LPC was listed as threatened in Colorado under the State's Nongame and Endangered or Threatened Species Conservation Act. In July of 1997, the NMDGF received a formal request to commence an investigation into the status of the LPC within New Mexico. In 1999, the recommendation to list the LPC as a threatened species under the Wildlife Conservation Act, was withdrawn until more information could be collected from landowners, lessees, and land resource managers who may be affected by the listing or who may have information pertinent to the investigation. In 2006, the NMDGF determined that the LPC would not be State-listed in New Mexico. Regardless of each State's listing status, most occupied LPC habitat throughout its current range occurs on private land (Taylor and Guthery 1980), where state wildlife agencies have little authority to protect or direct management of the species' habitat. Additionally, no laws or regulations currently protect LPC habitat on private land, aside

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from State harvest restrictions. There is no protection afforded to a candidate species under the ESA.

E. Other natural or manmade factors affecting its continued existence

Impacts from Drought

Drought is considered a universal ecological driver across the Great Plains (Knopf 1996). Infrequent, severe drought may cause local extinctions of annual forbs and grasses that have invaded stands of perennial species and recolonization of these areas may be slow (Tilman and El Haddi 1992). In this way, drought may impact LPC through its effect on seasonal growth of vegetation necessary to provide nesting and roosting cover, food, and opportunity for escape from predators (Merchant 1982; Peterson and Silvy 1994; Morrow et al. 1996). The sensitivity of LPC to drought was discussed by Crawford (1980) and Hamerstrom and Hamerstrom (1961). Precipitation appears to affect LPC adult population trends with a potential lag effect (Giesen 2000). That is, rain in one year promotes more vegetative cover for eggs and chicks in the following year, which enhances their survival. The effects of drought are likely exacerbated by land use practices, but no studies have clearly demonstrated such cumulative impacts on populations (Hagen and Giesen 2005). Along with other prairie grouse, LPC have a high reproductive potential in years of adequate conditions. In New Mexico, southern portions of the species range, which on average receive less total precipitation (i.e., Carlsbad area), are impacted more frequently and more severely by drought. LPC populations in these areas may have always been smaller and more variable than those farther to the north, although population data are insufficient to say this with certainty. Thus, drought conditions are unlikely to be the sole causative factor in long-term LPC population declines. The effects of drought on population growth rate may be more significant in small, fragmented populations.

Impacts from Collision Mortality

Wire fencing is common throughout LPC range as a means of confining livestock to ranches and pastures, or excluding them from areas not intended for grazing such as CRP, agricultural fields, and public roads. Like most grassland wildlife, LPC evolved in open habitats free of vertical features or flight barriers. Fences, power lines, or other wire structures are an unnatural threat to prairie grouse that, until recently, were seldom perceived as significant at the population level (Wolfe et al. 2007).

From 1999 to 2004, researchers recovered 322 carcasses of radio marked LPC in New Mexico, Oklahoma, and portions of the Texas panhandle. In New Mexico, only 14 percent of mortality could be traced to collision. Collision mortality is not unique to LPC, and is increasingly reported in several species of North American grouse. Sage grouse appear to be similarly vulnerable to fence collisions. However, additional investigation is necessary to fully quantify the magnitude of this ongoing threat to LPC rangewide.

With 14 percent of adult LPC mortality in New Mexico attributable to collision with man-made structures, the negative effect of fence collisions on long-term population viability for the LPC cannot be understated. Ligon (1951) expressed concern that spread of these features in eastern New Mexico might severely limit LPC populations; however, the full extent of collision mortality is unknown and difficult to measure. However, the Sutton Center has developed a low-cost method of marking barbed-wire fences to make them more visible to LPCs. Approximately 96 miles of fence have been marked in Oklahoma and the panhandle of Texas by this method

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(Donald Wolfe, Sutton Avian Research Center, pers. comm. 2008). Initial findings in 2007 indicated a marked drop in bird-fence collisions post-marking. Marking fences in core LPC habitats in New Mexico would be an inexpensive, easily implemented way to minimize one source of LPC mortality.

Sand Dune Lizard

A. Loss, Destruction, Modification, or Fragmentation of Habitat

Because the range of the species was not formally described until 1997, it is difficult to determine the extent of habitat loss range-wide. Increased fragmentation of shinnery oak-dune habitat from removal of shinnery oak for agriculture, cattle grazing, and oil and gas development may isolate SDL populations, increasing the likelihood of extinction (Snell et al. 1997). Habitat disturbance has already occurred within the range of the species, and there is little doubt that the current distribution and range is a small, but unquantified part of its historic range (Snell et al. 1997). Removal of shinnery oak dune complexes within occupied or suitable, unoccupied habitat poses a serious threat to a species that depends on a very specialized dynamic system. Because the dunal system is dynamic and dependant on sand movement, removing shinnery oak from occupied and suitable, unoccupied areas could impact the system's ability to form and stabilize dunes while maintaining connectivity among patches of habitat within the species' range.

Impacts from Oil and Gas Extraction

Currently, 61 percent of land within the New Mexico range of the SDL has been leased by private landowners, BLM, or NMSLO for oil and gas exploration. Within the 455,000 acres of shinnery oak-dune habitat in New Mexico, there are 3,078 oil pads/injection wells and 259 gas wells. Excluding associated roads, each oil pad averages two acres and each gas pad averages three acres. Currently, there is approximately 24,000 acres of caliche (material composed of calcium carbonate and clay used to stabilize road surfaces in an otherwise sandy substrate) pad disturbance, not including roads, within the area occupied by the species. The negative impacts of roads going through habitat include increased mortality due to collisons, soil compaction, decreased stability of microclimates, behavioral modification, loss of habitat and habitat quality, inhibited access to resources, subdivisions of populations into smaller more vulnerable habitat patches, division of the ecosystem with artificial linear gaps, generation of abrupt edges, and introduction of non-native, invasive weed species (Ingelfinger and Anderson 2004; Jaeger et al. 2005; Endriss et al. 2007; Delgado Garcia et al. 2007). Shinnery oak requires permeable sand in order to become established and grow and does not grow in areas with high amounts of calcium carbonate in the sand (Peterson and Boyd 1998). Habitat fragmentation and the reduction of overall shinnery dune habitat will impact survivorship, growth, and reproductive ability; lead to smaller effective populations; and decrease connectivity between populations (Chan et al. 2008). The size of habitat patches and suitable dune complexes will influence the probability of individual patches going extinct in this dynamic system. It is important to view the shinnery oak dune system as dynamic in order to maintain connectivity between patches in each of the geographic areas across the SDLs known range (Chan et al. 2008). When large habitat patches are divided into smaller patches there is increased edge habitat, decreased interior habitat, and increased probability of local extinction. The majority of the well pads are clustered in the southern part of the species' range in an area 5 mi wide and 16 mi across at its greatest length within the swath of habitat between US Highway 82 and US Highway 62. In this area, there are 142 mi^2 where there are greater than thirteen wells per section (1 mi^2).

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Impacts from Cattle Grazing

Alteration of native range to increase grass production for domestic livestock is the main impetus for shinnery oak removal; thus, livestock grazing can pose a significant indirect threat to the species (see following paragraph). Domestic livestock and wildlife grazing practices that reduce the ability of the land to sustain long term plant and animal production (Smith et al. 1996) may lead to the loss of grassland cover, mortality of plant species, and increased erosion. Further, improper grazing practices and increased conversion of rangelands to agricultural production may lead to habitat fragmentation and loss by promoting conditions favorable for shrub encroachment and by increasing infrastructure development, such as roads, drinkers, windmills, water pipelines, and fences (Dinerstein et al. 2000). These land management activities are compounded by extended drought periods and altered hydrologic functions.

Impacts from Tebuthiuron

Tebuthiuron is an herbicide used to remove shinnery oak from areas in order to convert them to agricultural land or increase grass forage production in areas used for livestock grazing. Direct correlation of the species' decline is not linked to the actual application of tebuthiuron, but instead is linked to the long-term effects associated with the removal of shinnery oak habitat. Snell et al. (1997) found that removal of shinnery oak through herbicide treatment resulted in a dramatic reduction and extirpation of SDLs. The study showed that the species' numbers dropped 70 to 90 percent in areas chemically treated compared to adjacent untreated plots. Some plots experienced 100 percent population loss (Snell et al. 1997). Ongoing removal of shinnery oak on State and private lands in New Mexico is an imminent threat to the species with long-term negative effects. .

Impacts from Off Highway Vehicles (OHV)

Established OHV areas such as Mescalero Sands North Dune OHV Area is historically occupied, Shugart Dunes is not currently occupied, and the Square Lake Dune complexes are adjacent to currently occupied SDL habitat. OHV use in these areas will be limited to existing road, trails, and unvegetated dunes (BLM 2008). Unauthorized and authorized OHV activities could cause soil compaction, degrade shinnery oak, flatten dunes, and can crush SDL and their eggs (Painter 2004). However, the BLMs RMPA (2008) halted cross country driving by OHVs. Through the RMPA, OHV use within LPC and SDL habitat is now limited to existing roads and trails.

Impacts from Alternative Energy Development

Eastern New Mexico is highly suitable for wind and solar energy development. The infrastructure for wind and solar energy would cause similar habitat fragmentation as that produced by oil and gas development. Although there is no specific information available to implicate wind or solar energy development as a threat to the SDL at this time, there is concern regarding potential effects if wind and solar development were to occur in the species' habitat. More information is necessary to determine what, if any effects will result from specific alternative energy projects that will be located within SDL habitat. However, the BLMs RMPA (2008) stated that applications to permit either solar or wind energy on public land within the RMPA planning area will not be approved unless the applicant can demonstrate that there will be no negative impacts to SDLs.

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B. Overutilization for commercial, recreational, scientific, or educational purposes

SDL is not a commercially valuable species, but may be increasingly sought by collectors because of its increasing rarity. Areas inhabited by this species are open to public access, and populations that are thought to be small and localized could become impacted and possibly extirpated by overcollecting. Scientific collecting is not thought to represent a significant threat to localized populations because voucher specimens are collected in very low numbers and at a very low frequency.

C. Disease or Predation

Impacts from Predators

During radio telemetry experiments, pit fall studies, and surveys a number of predators were observed eating SDLs. A nesting ecology study conducted by Hill and Fitzgerald (2007) showed that 20 percent of female SDLs were predated upon by coachwhips (large, swift, diurnal snakes that feed primarily on SDLs). Twice coachwhips were found leaving pitfall buckets, once with a SDL in its mouth.

Another predator, the loggerhead shrike (*Lanius ludovicanius*) is found in the Mescalero Sands habitat. These small predatory birds occur in many habitats from remote deserts to suburban areas. They perch on trees, shrubs, poles, fences, and utility wires and swoop down to capture their prey. Loggerhead shrikes have weak feet that are of little use for grasping prey while eating. Instead, they impale their prey on sharp objects, such as stout thorns or barbed-wire fences, and use their sharp bills to consume their catch (Alderfer 2006). SDLs have been found impaled on barbed-wire fences within shinnery oak dunes (Jones and Holmes 2003).

Impacts from Increased Competition and Predation

The side blotched lizard is a generalist lizard species that is found throughout the range of the SDL. Researchers studying the SDL have acknowledged that the side-blotched lizard is a direct competitor for resources with the SDL (Sena 1985) and have been documented to directly compet for insect prey (Sias and Snell 1996). In areas where there are large dune blowouts in shinnery dune complexes, the dominant lizard species is the SDL. As the habitat becomes marginal with smaller dune blowouts adjacent to shinnery flats or non-suitable habitat and in areas that have more habitat disturbance and greater edge effects, more side blotched lizards are present than SDLs (Painter 2007).

Impacts from Disease and Parasitism

There are no specific studies on the impacts of disease or parasitism that focus on SDL, but studies have been conducted on close relatives within the *Sceloporus* genus. *Sceloporus* lizards infected with malaria have reduced volumes of red blood cells, reduced hemoglobin, impaired physical stamina, reduced fat stores, lower fecundity, and smaller testes (Klukowski and Nelson 2001). Other lizards in the genus *Sceloporus* have parasitic helminthes in their gut. These helminthes have not been found in high number in SDLs, but further investigation should be done to determine if disease or parasites impact this species. Therefore, disease and parasitism are not currently known to be a threat to SDLs, but may need to be investigated in areas where their population losses are unexplained.

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D. The inadequacy of existing regulatory mechanisms

Although the NMDGF lists the SDL as endangered under the New Mexico Wildlife Conservation Act, the species is not afforded any habitat protection. The NMSLO does not currently place any protection on sensitive species such as the SDL on lands they administer and there are no other local or State regulatory mechanisms pertaining to the SDL in New Mexico. The species is not currently listed as threatened or endangered in Texas. There is no Federal protection afforded a candidate species under the ESA. Additionally, there are no other federally-listed species within the range of the SDL that might provide umbrella protection for the species. However, the BLM is actively providing education and outreach to users of the public land regarding SDL habitat needs, including the importance of shinnery oak in maintaining its habitat.

E. Other natural or manmade factors affecting its continued existence.

The species is an extreme habitat specialist associated with a single plant species that exists in an ecosystem that was previously more widespread and is now relict. Factors such as short life span, small clutch size, and the presence of natural competitors and predators contribute to the precarious status of this species. The species occurs in a fragmented range where populations are not connected for genetic exchange and are vulnerable to genetic drift and population loss due to random events. Because the species is not known to cross large expanses of unsuitable habitat, there is little chance of suitable habitat being recolonized without human intervention. Additionally, many natural events can quickly impact the shinnery oak system that would be equal to spraying with an herbicide or mechanically removing vegetation. Sudden Oak Death, drought, freezes, infestation of root boring insects, and a known lepidopteran parasite can quickly defoliate and kill giant stands of shinnery oak (Peterson and Boyd 1998).

Impacts from Exposure to Toxic Chemicals and Hydrogen Sulfide (H_2S) Emissions

Oil fields can contain a variety of activities that release toxic pollutants including petroleum hydrocarbons, polycyclic aromatic hydrocarbons (PAH) (e.g., phenanthrene, fluoranthene, and benzo[a]anthracene), oil spills, and air pollutants (U.S. Environmental Protection Agency 1999). Abdulla et al. (2008) reported that tissue samples taken from a sand dwelling lizard in Kuwait and its insect prey base (ants) contained PAH concentrations that increased with increasing exposure to these pollutants. Abdulla et al. (2008) reported that the concentrations of PAHs in lizard and ant tissues could impact the function of vital organs. Lizards may not be able to remove these chemicals from their system quickly due to their slow metabolic rate and simple enzyme system (Al-Hashem et al. 2007). The exposure to oil field chemicals also impacts the behavior and foraging time for sand lizard species (Abdulla et al. 2008). The sand dwelling lizard in Kuwait is of similar size and resides in similar habitat to SDL. Because much of SDL's habitat is located in small dune patches within oil and gas fields, the potential for exposure to toxic pollutants including both oil spills and chemical leaks is high.

Sias and Snell (1997) found that the number of SDLs decline with the increase in number of well pads per section. This could be due to the destruction of the shinnery oak habitat and the presence of the caliche pads and roads. It could also be due to the presence of H_2S gas emissions, other air pollutants, and other pollution-generating activities associated with petroleum extraction and processing near oil and gas wells. For example, H_2S is a highly toxic gas that is released during petroleum extraction and is the dominant reduced sulfur gas in oil

fields (Tarver and Dasgupta 1997). During petroleum extraction H_2S is removed from the petroleum, and the emissions are released into the air where they can remain for a day or less. H_2S is denser than air and tends to sink to the ground where it remains until it is neutralized (Lusk and Kraft 2006). Lusk and Kraft (2006) measured H_2S near Loco Hills, New Mexico (25 miles east of Artesia) where historically large populations of sand dune lizards were once found. They reported concentrations of H_2S as high as 33 parts per million (ppm) there for approximately 32 minutes. Most of the sulfur emitted by producing wells, tank batteries, production facilities, gas plants, sweetening plants, and pipelines may ultimately end up in the soil. Surface soil tests in active oil fields in Texas found sulfate levels to range between 20-200 ppm near active facilities (Tarver and Dasgupta 1997). This is relevant because SDLs dig-in just below the soil surface during hot parts of the day and at night, and thus would be in direct contact with the sulfates in the soil.

VI. CERTIFICATES OF PARTICIPATION (CP)

A CP is the mechanism for Participating Cooperators to voluntarily become part of this CCA while the LPC and SDL are still in candidate status. The procedure entails each Participating Cooperator signing a CP for a particular parcel of land (enrolled property), and agreeing to implement conservation measures on the enrolled property and provide funding for implementation of conservation measures that will benefit the LPC and/or SDL off-site of the enrolled property. Even though the owner of a lease or allotment may change over time, the CP will remain tied to the enrolled property described in the CP.

The Center of Excellence for Hazardous Materials Management (CEHMM), a 501(c)(3) will be responsible for enrolling Participating Cooperators. The FWS and the BLM will work cooperatively to determine which conservation measures are the highest priorities. It is important to note that funds or in-kind work (work conducted by a Participating Cooperator on lands for which they hold a lease or permit from the BLM) associated with a CP may or may not be used on the enrolled property as described under its corresponding CP since that area may not encompass the highest priority area identified for conservation actions by the BLM and the FWS.

Participating Cooperators will benefit from voluntarily enrolling in the CCA (via the CP) in several ways:

- In the event the LPC and/or SDL becomes listed under the ESA, the Participating Cooperator would receive a high degree of certainty that the biological opinion is unlikely to change from the conference opinion. As a result, it would be unlikely that more stringent restrictions or additional conservation measures would be required.
- In the event of listing, the Participating Cooperator could continue working under the terms of the CP without the additional requirement of a new section 7 consultation, requiring a minimum of 145 days to complete or until a programmatic assessment is completed.
- The Participating Cooperator could gain public relations benefits from their contribution toward LPC and SDL conservation.

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VII. CONSERVATION MEASURES

This section describes the approaches and strategies for conserving, and reducing and/or eliminating threats to the LPC and SDL. These approaches and strategies are based on ecological and biological principles to ensure a long-term approach to the protection and management of the LPC and SDL. Therefore, the ultimate goal of this CCA is to facilitate conservation of the LPC and SDL in southeastern New Mexico.

For example, Participating Cooperators can agree to protect and enhance existing populations and habitats, restore degraded habitat, create new habitat, augment existing populations of LPC, restore historic populations, or undertake other activities on their Federal leases/allotments which improve the status of the LPC and SDL. The management activities included in this CCA should reduce and/or eliminate threats to the species. Each CP will be negotiated on a case-by-case basis where Participating Cooperators will contribute funds to accomplish conservation measures above and beyond those required in the RMPA, and implement agreed upon conservation measures on the enrolled property. While it is not necessary to conduct all conservation measures listed below on every property enrolled under this CCA, approved conservation measures will be undertaken as necessary to reduce and/or eliminate a particular threat (See Appendix E). CEHMM, in coordination with the FWS and BLM, may use contributed funds to conduct conservation measures on non-Federal lands (private or State) if those landowners agree, in writing, to allow the implementation of the specified conservation measures on their lands. The goal is to implement the highest priority conservation measures needed (regardless of land ownership) to reduce and/or eliminate threats to both species, as determined by the FWS and BLM with input by CEHMM. As new information or empirical data becomes available, conservation measures can be modified or added through adaptive management to achieve greater species conservation.

Conservation measures to benefit the LPC include, but are not limited to: improving habitat and increasing populations by coordinating vegetation treatments with ongoing activities, decreasing habitat fragmentation, propagating and releasing and/or translocating individuals, and conducting research conducive to adaptive management of the LPC. Measures to benefit the SDL include, but are not limited to: preventing further habitat fragmentation and conducting research conducive to adaptive management of the SDL.

In order to ensure conservation measures provide the greatest possible benefit, and ultimately are sufficient to reduce extinction risk to acceptable levels, a Population Viability Analysis (PVA) will be undertaken for both the SDL and LPC in New Mexico and contiguous areas of western Texas using funds provided by Participating Cooperators. PVA is a mathematical modeling and simulation process using the best available demographic and distributional information that allows for the comparison of extinction risk under a variety of different future scenarios. The PVA will allow managers to evaluate the relative value of different suites of conservation actions in reducing extinction risk. The PVA will be an invaluable tool for optimizing the use of conservation funds generated through the CCA, and will play a key role in annual and long-term planning of CCA conservation activities aimed at reducing and/or eliminating threats to the LPC and/or SDL.

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RMPA Foundational Requirements

In April of 2008, BLM completed the Special Status Species Resource Management Plan Amendment for southeast New Mexico. The RMPA established foundational requirements to be applied to all future activities for Federal surface and Federal minerals (including private surface used for Federal mineral development). Regardless of whether a permittee or lessee participates in this CCA, these RMPA foundational requirements will be applied to all activities requiring Federal authorization within the RMPA area (refer to Appendix D). While these RMPA requirements make up the foundation of protection provided to habitat for the LPC and SDL, the strength of the CCA comes from implementing additional conservation measures that are additive, or above and beyond those in the RMPA.

Lesser Prairie-Chicken

Participating Cooperators will implement the following types of conservation actions. The following is a suite of conservation measures that can be applied to enrolled properties (as applicable to a Participating Cooperators' enrolled property) in addition to the foundational requirements established in the RMPA:

1. Establish Plans of Development for enrolled properties.

2. Construct all infrastructures supporting the development of a well (including roads, power lines, and pipelines) within the same corridor.

3. Construct new infrastructures in locations which avoid occupied and suitable LPC habitat.

4. Bury new distribution power lines that are planned within 2 miles of occupied LPC habitat (measured from the lek).

5. Minimize total new surface disturbance by utilizing alternative techniques such as co-locating wells, directional drilling, and interim reclamation of drill pads to minimum area necessary to operate the well.

6. Provide escape ramps in all open water sources.

7. Install fence markers along fences that cross through occupied habitat within 2 miles of an active lek.

8. Prohibit tebuthiuron spraying within 500 m of suitable and occupied habitat.

9. Design grazing management plans to meet habitat specific goals for individual ranches that may include stocking rates, rotation patterns, grazing intensity and duration, and contingency plans for varying prolonged weather patterns including drought.

10. Remove mesquite vegetation that invades into the soils preferred by LPC.

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Sand Dune Lizard

Participating Cooperators will implement the following types of conservation actions. The following is a suite of conservation measures that can be applied to enrolled properties (as applicable to a Participating Cooperators' enrolled property) in addition to the foundational requirements established in the RMPA:

1. Allow no surface occupancy within 200 meters of areas designated as occupied or suitable, unoccupied dune complexes or within delineated shinnery oak corridors. These complexes will be determined by FWS and BLM biologists within the known geographic range of the SDL. These areas will be determined at a landscape scale rather than a dune-by-dune scale and will also delineate corridors for movement between occupied and suitable, unoccupied dune complexes.

2. Route and construct new roads, pipelines and power lines outside of occupied and suitable, unoccupied shinnery dune complexes as delineated by FWS and BLM.

3. Limit seismic exploration to areas outside of occupied and suitable, unoccupied shinnery dune complexes as delineated by the FWS and BLM.

4. Establish Plans of Development for enrolled properties.

5. Submit a predetermined schedule for pipeline and facility maintenance to ensure proper functioning equipment in sensitive habitats to avoid potential accidental pollution events.

6. Prohibit tebuthiuron spraying within 500 m of suitable and occupied habitat (dune complexes) or within corridors that connect dune complexes that are within 2000 m from each other.

7. Prohibit OHV traffic within occupied or suitable dune complexes.

8. Remove mesquite vegetation that invades into the soils preferred by SDL.

VIII. RESPONSILBILITIES OF THE PARTIES

CEHMM shall be responsible for:

- Implementing and administering this CCA;
- Enrolling Participating Cooperators in accordance with this CCA via CPs;
- Meeting with Participating Cooperators to provide technical assistance if they plan to implement (rather than contributing funds towards) conservation measures;
- Conducting compliance reviews of projects being implemented by Participating Cooperators;
- Using contributed funds to contract and inspect projects.
- Monitoring projects (using existing FWS/BLM monitoring protocols) in order to determine success and adaptations needed;
- Conducting outreach and public education efforts to promote the conservation of both

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species;
- Securing permission to complete projects on private and State lands, where appropriate;
- Annually leading a meeting with the FWS, BLM, and interested Participating Cooperators to review progress from the previous year, seek potential solutions for factors that are hampering conservation of LPCs/SDLs, and discuss actions that would benefit the LPC/SDL to be initiated in the upcoming year;
- Tracking expenditure of funds and preparing an annual report on implementation of this CCA;
- Using no more than 10 percent of contributed funds for their administrative responsibilities under this CCA; and
- Maintaining a digital photo database to document project (i.e., conservation measure) performance. This database will be one tool in the analysis of conservation measures for adaptive management of the CCA.

The FWS and BLM shall be responsible for:
- Prioritizing the conservation projects (or types of projects) to be completed;
- Evaluating monitoring data to determine if conservation measures are providing the desired conservation benefit to the LPC and SDL;
- Reviewing and approving CPs as submitted by CEHMM; and
- Holding CEHMM harmless from any claim or liability arising from this CCA;

The BLM shall be responsible for:
- Completing environmental assessments and clearances for mitigation measures implemented on public land.

Participating Cooperators shall be responsible for:
- Enrolling in this CCA by entering into a CP with CEHMM;
- Completing any in-kind conservation measures outlined in their CP or contribute funding towards conservation measures (based on Appendix C); and
- Allowing CEHMM, BLM, or FWS personnel to survey and monitor enrolled properties for LPC and SDL populations, suitability of habitat, and effectiveness of conservation measures.

IX. FUNDING

Funds contributed by Participating Cooperators will be held and utilized by CEHMM to accomplish conservation measures. Under this Agreement, no funds will be exchanged between the Parties (FWS, BLM, and CEHMM). A team consisting of government managers and specialists will meet (at least) annually with the CEHMM to develop a strategy to guide project and conservation measure prioritization. The criteria for determining priority conservation areas will include occupancy by the LPC and/or SDL, the potential for occupancy by the LPC and/or SDL (e.g., connectivity, absence of major threats to the species) on a given site, as well as quality and quantity of suitable habitat for both species. The team will coordinate actions with other, ongoing conservation activities, including in-kind services, to provide the greatest benefit to both species. Funds for research, monitoring, and education may also be set aside each year, as appropriate. In addition to completing conservation measures identified in CPs, Participating

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Cooperators will contribute funds (according to Appendix C) for off-site conservation measures to benefit the LPC and/or SDL.

X. ADAPTIVE MANAGEMENT

This CCA is based on adaptive management principals. The FWS and the BLM agree and recognize that implementation of the conservation measures herein must be consistent with the concepts and principals of adaptive management. The effectiveness of the conservation measures, monitoring methods, and new technologies will be reviewed by the FWS and BLM on an annual basis. Upon such evaluation, appropriate modifications to the conservation measures will be incorporated to further enhance the goals of this CCA.

XI. DURATION OF THE CCA

This CCA will remain in effect until one or more parties (CHEMM, BLM, or FWS) terminate it. Any signatory may withdraw from this agreement at any time by providing 30 days written notice to all other signatories. Any signatory may propose changes to this agreement. Such changes will be in the form of an amendment and may be considered at any time after a 30-day notice to all parties. No amendment shall be valid unless executed by all parties to this agreement. All parties will meet at least annually to review the CCA and its effectiveness to determine whether revision is necessary. If CEHMM terminates their participation in the CCA, any unexpended funds will be transferred to a 501(c)(3) designated by the FWS and BLM.

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XII. SIGNATURES

IN WITNESS WHEREOF, THE PARTIES HERETO have, as of the last signature below, executed this CCA to be in effect as of the date of the last signature.

_____ _____

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

_____ _____

State Director Date
U.S. Bureau of Land Management, NM/OK/TX/KS

_____ _____

Executive Director Date
Center of Excellence for Hazardous Materials Management

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XIII. APPENDICES

Appendix A

CERTIFICATE OF PARTICIPATION
In the
Candidate Conservation Agreement for the Lesser Prairie-Chicken (*Tympanuchus pallidicinctus*) and Sand Dune Lizard (*Sceloporus arenicolus*)

This certifies that the Participating Cooperator of the property described herein is included within the scope of the above named Candidate Conservation Agreement (CCA) for the lesser prairie-chicken (LPC) and sand dune lizard (SDL) under the authority of Section 10(a)(1)(A) of the Endangered Species Act of 1973, as amended (ESA), 16 U.S.C. 1531-1544.

The goal of all Parties is to reduce and/or eliminate threats to the LPC and/ or SDL. By agreeing to conduct the conservation measures described herein, or contributing funding towards their accomplishment, the Parties agree that should the LPC or SDL become listed, there is a high degree of certainty that additional measures would not be required on the enrolled land legally described below. If a Participating Cooperator chooses to no longer provide the conservation measures in the Certificate of Participation (CP), protections described herein are no longer applicable.

Participating Cooperator's Name: _____

Address: _____

Legal Description of Enrolled Lands (Also attach a detailed map): _____

_____

Total Acres of Enrolled Lands (all lands covered by permit): _____

Description of Conservation Measures to be accomplished by Participating Cooperator:
_____
_____
_____
_____
_____
_____

Funds to be contributed by Participating Cooperator based on the table in Appendix C:
$_____

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Succession and Transfer. This CP is tied to the land described above and cannot be transferred to other land, and shall be binding on successors and transferees. If the lease is transferred, the new owner(s) will have the same rights and obligations with respect to this CP as the original owner. For oil and gas Participating Cooperators, the CP is good for the term of the lease, or as long as the lease is held by production.

This CP is a voluntary agreement between the Center of Excellence for Hazardous Materials Management (CEHMM) (as administrator of the CCA between the Bureau of Land Management (BLM) and the U.S. Fish and Wildlife Service (FWS)) and the Participating Cooperator. Through this CP, the Participating Cooperator voluntarily commits to implement or fund specific conservation actions that will reduce and/or eliminate threats to the SDL and /or the LPC. Funds contributed as past of this CP will be used to implement conservation measures. The funds will be directed to the highest priority habitat area, which may or may not be this enrolled property. By signing below, the Participating Cooperator acknowledges that they have read and understand the CCA. They further acknowledge that this CCA may not be sufficient to prevent the listing of either species.

IN WITNESS WHEREOF THE PARTIES HERETO have executed this Certificate of Participation to be in effect on the date of the last signature below.

_____

Participating Cooperator (Permittee or Lessee/Operator)

Date_____

_____

Center of Excellence for Hazardous Materials Management

Date_____

_____

FWS Authorized Officer

Date_____

_____

BLM Authorized Officer

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Date_____

Appendix B

Participating Cooperator Options for the Certificate of Participation

In addition to the suite of conservation measures on identified in Section VII of the Candidate Conservation Agreement (CCA), Participating Cooperators will either implement in-kind conservation or contribute funds for conservation as part of the Certificate of Participation (CP). Conservation measures fall into general categories of habitat enhancement or avoidance of negative habitat impacts, mortality mitigation, research, and providing facilities for propagation or translocation of the species (specifically only for the LPC).

Funding requirements for Participating Cooperators who are oil and gas leaseholders are based on:

- reclamation costs for the amount of surface disturbance within the lease area,
- the habitat category where the disturbance will occur, and
- reclamation goals for each habitat category.

Reductions were applied to some options based on the amount of benefit to the lesser prairie-chicken (LPC) and sand dune lizard (SDL) conservation.

The current cost to reclaim one acre, including the removal of caliche and reseeding operations, is approximately $2,500. On average, a location (location types include anything that requires surface disturbance for production facilities, *e.g.*, oil, gas, injection, monitoring wells, and compressor stations) consists of 4 acres of caliche which includes the actual pad and the road. Therefore, the current total for reclamation of one average location is approximately $10,000. The habitat categories for LPC in New Mexico are defined in the Special Status Species Resource Management Plan Amendment (RMPA) of 2008 as:

- PPA = Primary Population Area
- CMA = Core Management Area
- HEA = Habitat Evaluation Area
- SSPA = Sparse and Scattered Population Area
- IPA = Isolated Population Area

Reclamation goals by habitat categories based on the importance to the species stability are:

- PPA/CMA = 2 acres reclaimed : 1 new acre disturbed
- HEA = 1.5 acres reclaimed : 1 new acre disturbed
- SSPA = 1.25 acres reclaimed : 1 new acre disturbed
- IPA = 1 acres reclaimed : 1 new acre disturbed

Options for an Oil and Gas Leaseholder/Operator under a Certificate of Participation

The goal for an oil and gas CP is for leaseholders to voluntarily contribute funding or in-kind actions to benefit the LPC or SDL. The intent is to provide options that would insure measurable benefits to each species' conservation. The following scenarios include:

- the new locations option at full field development (most expensive option);
- the lease option which has a 25 percent reduction in contributions compared to the new

location option at full field development;

- the co-location option which has a 70 percent reduction in contributions compared to building a new location; and

For actual contribution scenarios, refer to the tables located in Appendix C.

The Lease Option

A leaseholder/operator signs a CP that allows for a total number of locations based on one location per 40-acre spacing in the lease. This option is most advantageous to the lease holder (most cost-effective with a 25 percent reduction over the per well option) if full field development is anticipated. For example, a 640-acre lease may allow up to 16 locations to be included in the CP. This option is also more time efficient for the Center for Excellence of Hazardous Materials Management (CEHMM) to administer and track. This option has the ability to generate contributed funding in a timely manner for the implementation of conservation measures in SDL and LPC habitat. Under this scenario, lessees would still be required to avoid dune complexes and connecting corridors as required by the RMPA (2008). If there are numerous dunes in the lease area, this may not be the most appropriate option.

The Per Location Option

A leaseholder/operator signs a CP that includes only a planned number of locations: either new, co-located, or a combination of both. Disadvantages of this option include: for the leaseholder, it could cost more in the long run should they decide to develop more locations than originally planned; and for CEHMM , there could be multiple CPs to administer and track for a single lease. There could be an advantage to lease holder who knows they will only develop a small number of locations on the lease. Under this scenario, lessees would still be required to avoid dune complexes and connecting corridors as required by the RMPA (2008).

- A. New Locations:
  A leaseholder/operator signs a CP for one or more new locations they plan to develop on their lease. This option is the most expensive for the leaseholder because it provides the least conservation benefit to the SDL or LPC since every location creates new surface disturbance and increases habitat fragmentation. It does however potentially allow for more wells than the Lease Option (e.g., oil spacing at 40 acres/well plus gas spacing at 160 acres/well). Under this scenario, lessees still have to stay out of dune complexes as required by the RMPA (2008).

- B. Co-Locations:
  A leaseholder/operator signs a CP for the number of co-located wells they plan to develop from a single location. It is the least costly option for leaseholders (with a 70 percent reduction over the New Location Option) because it provides the greatest conservation of habitat by reducing surface disturbance and habitat fragmentation.

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The Contributions Table (Appendix C) provides a basis for comparing each of the options and combinations. Contributions are based on the number of 40-acre spaces within a mineral lease for two options and less-than-40-acre spacing for another option, the proposed number of new locations and planned co-locations on the lease, the habitat category for LPC, and the current cost of reclamation. When a Participating Cooperator opts for contributing funds (rather than doing conservation practices themselves) would require a transfer of funds to CEHMM prior to the CP becoming effective. Leaseholders/Operators who opt to complete in-kind conservation measures themselves would have a deadline and a measurable standard for completion of those actions written into the CP by CEHMM. Their CP would not become effective until the work was completed and approved by CEHMM.

Options for a Livestock Grazing Certificate of Participation

The level of commitment for a CP for a livestock operator would be appraised on an individual basis since ranching operators vary widely in the type and size of operation authorized on public lands. Consideration will be given to the type of conservation measures most needed on their specific allotment (i.e., deferment of grazing, rest rotation grazing management, and fence marking). Other measures could include brush treatments, fence or power line removal, or providing a location or facility for releases of captive-bred or translocated LPCs.

A CP containing in-kind implementation of conservation measures will have a deadline and measurable standards for completion of each specific action written into the CP by CEHMM. These CPs would not become effective until the work was completed and approved by CEHMM.

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Appendix C

Contributions Table

"By the Lease" Option (A 25% reduction compared to full field development by the well)						
Lease Size		40 Acres°	80 Acres	160 Acres	320 Acres	640 Acres
Well Spaces		1	2	4	8	16
Habitat Category	PPA	$20,000	$30,000	$60,000	$120,000	$240,000
	CMA	$20,000	$30,000	$60,000	$120,000	$240,000
	HEA	$15,000	$22,500	$45,000	$90,000	$180,000
	SSPA	$12,500	$18,750	$37,500	$75,000	$150,000
	IPA	$10,000	$15,000	$30,000	$60,000	$120,000

"By the Well" Option (All new construction for locations at full field development)							
Lease Size		40 Acres	80 Acres	160 Acres	320 Acres	640 Acres	Ratio Of Reclamation
Total Wells		1	2	4	8	16	
Habitat Category	PPA	$20,000	$40,000	$80,000	$160,000	$320,000	**2 : 1**
	CMA	$20,000	$40,000	$80,000	$160,000	$320,000	**2 : 1**
	HEA	$15,000	$30,000	$60,000	$120,000	$240,000	**1.5 : 1**
	SSPA	$12,500	$25,000	$50,000	$10,000	$200,000	**1.25 : 1**
	IPA	$10,000	$20,000	$40,000	$80,000	$160,000	**1 : 1**

* : One well on 40 acre spacing is full field development “by the well”

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By the Well" Option in IPA
(Scenarios including co-located wells)

40 Acres	80 Acres: 2 well spaces		160 Acres: 4 well spaces		320 Acres: 8 well spaces		640 Acres: 16 well spaces	
N/A	$13,000.00	1 N 1 C	$33,000.00	3N 1 C	$73,000.00	7 N 1 C	$153,000.00	15N 1C
			$26,000.00	2N 2 C	$66,000.00	6N 2C	$146,000.00	14N 2C
			$19,000.00	1 N 3 C	$59,000.00	5N 3C	$139,000.00	13N 3C
					$52,000.00	4N 4C	$132,000.00	12N 4C
					$45,000.00	3N 5C	$125,000.00	11N 5C
					$38,000.00	2N 6C	$118,000.00	10N 6C
					$31,000.00	1N 7C	$111,000.00	9N 7C
							$104,000.00	8N 8C
							$97,000.00	7N 9C
							$90,000.00	6N 10C
							$83,000.00	5N 11C
							$76,000.00	4N 12C
							$69,000.00	3N 13C
							$62,000.00	2N 14C
							$55,000.00	1N 15C

N = Well requiring a new location

C = Well co-located with an existing location

"By the Well" Option in SSPA
(Scenarios including co-located wells)

40 Acres	80 Acres: 2 well spaces		160 Acres: 4 well spaces		320 Acres: 8 well spaces		640 Acres: 16 well spaces	
N/A	$16,250.00	1 N 1 C	$41,250.00	3N 1 C	$91,250.00	7 N 1 C	$191,250.00	15N 1C
			$32,500.00	2N 2 C	$82,500.00	6N 2C	$182,500.00	14N 2C
			$23,750.00	1 N 3 C	$73,750.00	5N 3C	$173,750.00	13N 3C
					$65,000.00	4N 4C	$165,000.00	12N 4C
					$56,250.00	3N 5C	$156,250.00	11N 5C
					$47,500.00	2N 6C	$147,500.00	10N 6C
					$38,750.00	1N 7C	$138,750.00	9N 7C
							$130,000.00	8N 8C
							$121,250.00	7N 9C
							$112,500.00	6N 10C
							$103,750.00	5N 11C
							$95,000.00	4N 12C
							$86,250.00	3N 13C
							$77,500.00	2N 14C
							$68,750.00	1N 15C

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"By the Well" Option in HEA (Scenarios including co-located wells)								
40 Acres	80 Acres: 2 well spaces		160 Acres: 4 well spaces		320 Acres: 8 well spaces		640 Acres: 16 well spaces	
N/A	$19,500.00	1 N 1 C	$49,500.00	3N 1 C	$109,500.00	7 N 1 C	$229,500.00	15N 1C
			$39,000.00	2N 2 C	$99,000.00	6N 2C	$219,000.00	14N 2C
			$28,500.00	1 N 3 C	$88,500.00	5N 3C	$208,500.00	13N 3C
					$78,000.00	4N 4C	$198,000.00	12N 4C
					$67,500.00	3N 5C	$187,500.00	11N 5C
					$57,000.00	2N 6C	$177,000.00	10N 6C
					$46,500.00	1N 7C	$166,500.00	9N 7C
							$156,000.00	8N 8C
							$145,500.00	7N 9C
							$135,000.00	6N 10C
							$124,500.00	5N 11C
							$114,000.00	4N 12C
							$103,500.00	3N 13C
							$93,000.00	2N 14C
							$82,500.00	1N 15C

"By the Well" Option in CMA/PPA (Scenarios including co-located wells)								
40 Acres	80 Acres: 2 well spaces		160 Acres: 4 well spaces		320 Acres: 8 well spaces		640 Acres: 16 well spaces	
N/A	$26,000.00	1 N 1 C	$66,000.00	3N 1 C	$146,000.00	7 N 1 C	$306,000.00	15N 1C
			$52,000.00	2N 2 C	$132,000.00	6N 2C	$292,000.00	14N 2C
			$38,000.00	1 N 3 C	$118,000.00	5N 3C	$278,000.00	13N 3C
					$104,000.00	4N 4C	$264,000.00	12N 4C
					$90,000.00	3N 5C	$250,000.00	11N 5C
					$76,000.00	2N 6C	$236,000.00	10N 6C
					$62,000.00	1N 7C	$222,000.00	9N 7C
							$208,000.00	8N 8C
							$194,000.00	7N 9C
							$180,000.00	6N 10C
							$166,000.00	5N 11C
							$152,000.00	4N 12C
							$138,000.00	3N 13C
							$124,000.00	2N 14C
							$110,000.00	1N 15C

Formula used is: ((n)+(c*0.3))*h(10000)=Benefit
n= Number of new well locations
c=Number of co-located wells
0.3 = 70% reduction compared to a new location
h= Habitat coefficient based on reclamation goal
10000 = $10,000 (cost to reclaim 4 acres of caliche)

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Appendix D – **Bureau of Land Management**
Special Status Species Resource Management Plan Amendment (RMPA) Management Decisions for Lesser Prairie Chicken (LPC) and Sand Dune Lizard (SDL)
Approved April 2008

The RMPA established baseline requirements to be applied to all future activities for Federal surface and Federal minerals (including private surface used for Federal mineral development). Regardless of whether a permittee or lessee participates in this Candidate Conservation Agreement (CCA), these RMPA baseline requirements will be applied to all activities requiring Federal authorization within the RMPA area.

The following areas are closed to new oil & gas leasing:

- The Core Management Area (CMA), including Mathers RNA, Mescalero Sands Areas of Critical Environmental Concern (ACEC) and Sand Ranch ACEC.
- Occupied and suitable LPC habitat within the Primary Population Area (PPA).
- Potentially suitable LPC habitat within the PPA may be closed depending on its location relative occupied and suitable habitat.
- Occupied LPC habitat within the Sparse and Scattered Population Area (SSPA) and the Isolated Population Area (IPA).
- The 17 Habitat Evaluation Areas (HEAs) within the IPA may be closed, depending on the results of the evaluation.
- Areas "closed to new oil and gas leasing" amount to 220,000 acres (previous RMP had only 11,000 acres closed).

Occupied LPC habitat. All areas within 1.5 miles of an active LPC site, regardless of vegetation that has been active for one out of the last 5 years. Upon discovery of a previously unknown active site, the surrounding 1.5-mile radius is considered occupied habitat.

Suitable LPC habitat. Unoccupied areas of appropriate vegetation type, in patches of 320 acres or more, falling entirely outside of Robel impact/avoidance distances around infrastructure.

Areas where No Surface Occupancy requirements will be applied to new oil & gas leasing:

- Tracts along the edge of the CMA needed for proration or drainage purposes.
- Tracts within the PPA needed for proration or drainage purposes that do not impact suitable habitat.
- In the 17 HEAs, depending on the results of the evaluations.
- Amounts to 24,000 acres. (The previous RMP had only 7,000 acres of NSO).

Areas open to new oil and gas leasing with Timing and Noise requirements to protect LPC activity:

- Timing requirement expanded to March 1 through June 15 (no noise from 3 am until 9 am). The timing requirement use to be 3/15 to 6/15.
- Exceptions to timing requirement considered up to March 15. No exceptions after that date.

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- Noise not to exceed 75 db measured 30 feet from the source.
- Amounts to 80,000 acres (previous RMP had only 287,000 acres with Timing/Noise requirements, which decreased because these acres have moved to either "Closed to New Leasing" or the "No Surface Occupancy" categories above).

Plans of Development
A plan of development (POD) is required on all new and existing oil and gas leases when requested by the authorized officer.

When developing existing oil and gas leases, no disturbance will be allowed within 200 meters of known LPC leks (see timing and noise requirements) plus a POD is required before the well location will be approved when requested by the authorized officer.

Sand Dune Lizard habitat protections applied to oil and gas development:
- New oil and gas leases
    - No Surface Occupancy will be applied to dune complexes within tracts proposed for leasing.
    - POD required before the first well location can be approved when requested by the authorized officer.
- Existing oil and gas leases
    - POD required when requested by the authorized officer.
    - Lessee conducts a habitat survey prior to approval of activities.
    - No surface disturbance within up to 200 meters of SDL habitat.

Utility Corridors
In accordance with the Energy Policy Act of 2005, BLM designated interstate utility corridors which go around the Planning Area.

Within SDL habitat, new surface disturbance (rights-of-way) in dune complexes will not be authorized unless the action could be beneficial to the species, as determined by the authorized officer.

Powerline Removal Program
In order to reduce the number of overhead electric power lines, the power liner removal credit (PLRC) program has been established. The PLRC program features:
- Allows 1.0 mile of new overhead power line to be constructed for every 1.5 miles of idle line, including poles, removed.
- Participants in the program can bank the credits.
- Credits can be earned regardless of surface ownership.

Vegetation & Livestock Grazing decisions include:
- An allottee may voluntarily relinquish grazing on an allotment. Relinquishment will be reviewed during the next revision of the management plan.
- Requirements for spikes on posts and reflectors on wire on new fences in the LPC habitat incorporated into best management practices in order to reduce LPC mortality associated with fences.

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- Vegetation treatment areas will be rested from grazing for 2 growing seasons unless a different time period, longer or shorter, is necessary to achieve habitat requirements.
- Occupied and suitable SDL habitat would not be chemically treated unless the SDL is removed from State or Federal lists; or a chemical application rate is developed that would not impair habitat.

Solar & Wind Energy

BLM would only consider solar or wind energy generating applications that produce no negative impacts to LPC or SDL habitat.

Recreation decisions include:

- If visitation begins to negatively impact LPC, a permit system would be instituted.
- If determined to be necessary, generators associated with recreation uses would not be allowed in or near LPC leks from March 1 to June 15 between the hours of 3 am and 9 am.

Sand Ranch Area of Critical Environmental Concern

- Established through the RMPA.
- The management goal of the ACEC is to protect and enhance LPC/SDL habitat:

  37,000 acres Public land
  11,000 acres State land
  10,000 acres private land
  58,000 acres total

- Provides for the following management:

  Allows for voluntary relinquishment of grazing in allotments.
  Closes the area to future oil and gas leasing.
  Closes the area to locatable, leasable and saleabe mineral entry.
  Emphasizes land exchanges with State Land Office to block up land management.
  Sets in place mechanism for acquiring private land from willing sellers.

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Appendix E – Table Showing How Conservation Measures Can Reduce and/or Eliminate Threats to the Lesser Prairie-Chicken and Sand Dune Lizard

Threat		Overall Threat Level	Conservation Measures Used to Address Threat
Sand dune lizard	Habitat Loss, Fragmentation, Degradation	High	No surface occupancy within 200 meters of dune complexes.
			Prohibit tebuthiuron spraying within 500 meters of dune complexes or within corridors connecting dune complexes.
			Route and construct new roads, pipelines, and powerlines outside of dune complexes.
			Establish Plans of Development for all new enrolled properties.
			Limit seismic exploration in dune complexes.
			Prevent encroachment of invasive nonnatives in dune complexes.
			Prevent entry into areas closed to OHV use.
			Prohibit OHV use in occupied and suitable dunes.
	Exposure to Toxic Chemicals and Hydrogen Sulfide Emissions	Moderate	Submit a predetermined schedule for pipeline and facility maintenance.
			Schedule facility maintenance.
Lesser Prairie-Chicken	Habitat Loss, Fragmentation, Degradation	High	Establish Plans of Development for all new enrolled properties.
			Construct all infrastructures (i.e., roads, powerlines, and pipelines) for well development within the same corridor.
			Construct new infrastructures in locations which avoid occupied and suitable LPC habitat.
			Bury new distribution power lines that are planned within 2 miles of occupied LPC habitat (measured from the lek).
			Minimize total new surface disturbance by co-locating wells, directional drilling, and interim reclamation of drill pads.
			Prohibit tebuthiuron spraying within 500 m of suitable and occupied habitat.
			Design grazing management plans to meet habitat specific goals for individual ranches.
			Remove mesquite vegetation that invades into the soils preferred by LPC.
	Fence Collisions	Moderate	Install fence markers along fences that cross through occupied habitat within 2 miles of an active lek.
	Predation	Moderate	Bury new distribution power lines that are planned within 2 miles of occupied LPC habitat (measured from the lek).

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XV. ATTACHMENTS

Attachment # 1 – CCAA

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