United States Department of the Interior
U.S. FISH AND WILDLIFE SERVICE
Ecological Services
P.O. Box 1306, Room 6034
Albuquerque, New Mexico 87103

In Reply Refer To:
FWS/R2/ES-TE/057711

August 13, 2014

Jason Weller, Chief
United States Department of Agriculture
National Resources Conservation Service
Post Office Box 2890
Washington, D.C. 20013

02E00000-2013-F-0001

Dear Chief Weller:

This document transmits the Fish and Wildlife Service's (Service) Biological Opinion (Opinion) for the Natural Resources Conservation Service's (NRCS) Lesser Prairie-Chicken Initiative (LPCI) and associated procedures, conservation practices, and conservation measures. Our review is based on information provided by NRCS and other sources of information referenced below. This Opinion is conducted in accordance with section 7 of the Endangered Species Act of 1973, as amended (ESA).

The focus of this Opinion is the lesser prairie-chicken (*Tympanuchus pallidicinctus*), which was listed as threatened on March 27, 2014 (79 FR 20074). The lesser prairie-chicken (LPC) is a species of prairie grouse that occupies a five-state range encompassing portions of Texas, New Mexico, Oklahoma, Kansas and Colorado. Lesser prairie-chicken populations need large tracts of relatively intact native grasslands and prairies to thrive. Significant threats to the LPC include habitat loss, modification, degradation, and fragmentation within its range. The vast majority (approximately 95 %) of LPC habitat occurs on privately owned and operated lands across the five-state range. Therefore, the voluntary actions of private landowners are the key to maintaining, enhancing, restoring and reconnecting habitat for the species.

This Opinion contains the Service's analysis of the expected adverse, benign, and beneficial effects likely to result from implementation of all aspects of the LPCI and related planning processes on the LPC and its habitats, including the effects of applying LPCI conservation practices and conservation measures on lands in LPC habitat that are not enrolled in the LPCI. Overall effective implementation of the NRCS conservation practices and their associated conservation measures described in this Opinion are anticipated to result in a positive population response by the species by reducing or eliminating potential adverse effects and producing more acres of habitat managed specifically for the LPC. However, implementing the conservation

practice standards and associated conservation measures may also result in short-term adverse effects to individual birds in order to secure long-term benefits to the species as a whole.

Sincerely,

Michelle Shaughnessy

Assistant Regional Director
Ecological Services

BIOLOGICAL OPINION

INTRODUCTION

LPCI Background

The LPCI is a conservation initiative based upon a targeted conservation systems approach to implement specific conservation practices to manage and enhance habitat for the LPC and expand their habitats within the context of sustainable ranching. The LPCI focuses NRCS and partner resources on high priority regions within the LPCI Action Area.

The LPCI includes the following components: (1) strategic focus of technical and financial resources on priority LPC areas; (2) the implementation of conservation practice standards to support the needs of the LPC using specific conservation measures; (3) the development of a science support plan which includes systematic monitoring and assessment of the results of on-the-ground actions; (4) a comprehensive training program; and (5) funding of both technical and financial assistance.

Consultation History

After the LPCI was established in 2010, NRCS sought the Service's assistance in determining what actions would result in avoiding or minimizing potential long-term adverse effects to the overall LPC population, and improve the effectiveness of conservation practices that may result in a range-wide benefit to the species. Both agencies agreed to use the conferencing procedures under Section 7 of the ESA and worked together to complete a Conference Report in June 2011 that evaluated the collective, landscape-level effects of implementing all aspects of the LPCI on the LPC. The Conference Report included the Service's determination that the proposed action was not likely to jeopardize the continued existence of the LPC and provided regulatory predictability to cooperators that their voluntarily implementation of the NRCS-sponsored conservation practices and conservation measures covered in the Conference Report will be in compliance with the ESA. The NRCS and Service also agreed to use the Conference Report as the basis for cooperative development of this Opinion.

In November 2012, NRCS requested an amendment to the Conference Report to include the conservation practice standard (612) for Tree and Shrub Planting. With conservation measures identified to avoid potential adverse effects to LPC from application of practice standard 612, the Service concurred with the proposed amendment to the Conference Report. At this same time, the agencies began work on converting the Conference Report to a Conference Opinion. On November 22, 2013, the Service issued a Conference Opinion for the LPCI. The Conference Opinion built upon, refined, and updated the earlier Conference Report in several ways, including the addition of four conservation practices to the 23 evaluated in the original Conference Report, the establishment of a new method of determining when the conservation measures are to be applied, an estimate of incidental take, and an associated Incidental Take Statement that covers take of LPC by cooperators who implement the described conservation practices and measures.

On April 14, 2014, NRCS submitted its request to the Service to confirm the Conference Opinion into a Biological Opinion. This is the subject of the proposed action analyzed herein.

DESCRIPTION OF THE PROPOSED ACTION

The action for the purposes of this Opinion includes the application of certain conservation practices incorporated into NRCS conservation plans and implemented by NRCS clients in LPC habitat following the planning process and the conservation measures described in this Opinion. The 27 conservation practices used to implement the LPCI and evaluated as part of the proposed action are listed in Table 1.

Practices implemented under the LPCI, which includes practices implemented by NRCS clients participating in Working Lands for Wildlife (WLFW), consist of:

- The core conservation management practice of Upland Wildlife Habitat Management, which will be supplemented by Prescribed Grazing as a core management practice when livestock are present, for the benefit of LPC and its habitat;

- Practices that facilitate the application of the core conservation management practices that, in themselves, may or may not be beneficial to LPC and its habitat; and

- Practice-specific conservation measures that can minimize or eliminate detrimental effects of conservation practices to LPC and its habitat.

Producers identified as having LPC habitat or potential LPC habitat who are not part of LPCI (i.e., not enrolled in LPCI and not receiving LPCI funding assistance) will be using conservation practices as modified by the conservation measures described in this Opinion, but are not required to implement these practices under a management plan developed in accordance with the Core Practice (645) Upland Wildlife Habitat Management. The use of this Core Practice in every landowner plan participating in the LPCI, with guidance from the results of the Wildlife Habitat Evaluation Guide (WHEG), is essential to ensure that NRCS' planning emphasis places priority on the needs of the LPC and thereby achieves the expected conservation goals and outcomes of the proposed action.

A flow chart (Appendix VII) has been provided for use in determining when LPC habitat is present and when the conservation measures described in this Opinion must be applied as part of the proposed action. This flow chart may be completed by field staff and utilized as documentation of presence or absence of LPC habitat and whether financial and technical assistance provided by NRCS is covered by this Opinion. If LPC habitat is identified as present when NRCS is providing assistance, a Wildlife Habitat Evaluation Guide (WHEG) will be completed to identify where LPC habitat could be improved.

It is important to note that the proposed action does not involve the following elements or potential sources of adverse effects to the LPC.

- Commercial-scale energy development or associated infrastructure.

- Conversions of rangeland and other suitable LPC habitat types to crop production or development.

- Construction of new public roads or highways.

- Actions and programs managed by the Farm Service Agency (FSA) as the agency with responsibility for administration of the Conservation Reserve Program (CRP).

Action Area

The Action Area includes all of the current estimated occupied range (Lesser Prairie Chicken Interstate Working Group 2013 (http://www.wafwa.org/html/prairie_chicken.shtml). (LPCIWG 2013) and a surrounding buffer of 16 km (see Map 1). The buffer was based on a comparison of natal dispersal and other extensive movements of adult prairie chickens (Copelin 1963, Hagen 2003) that suggested that 16 km (approximately 10 miles) represents the average long-distance movements of the LPC in fragmented landscapes. The Action Area map is intended to be used with the Opinion in conjunction with the Southern Great Plains Crucial Habitat Assessment Tool (CHAT) developed by State Fish and Wildlife Agencies Interstate Working Group and the delineation of ecoregions, focal areas, and connectivity zones identified in the range-wide conservation plan for the LPC (LPCIWG 2013).

Implementation of Conservation Practices

NRCS provides technical and financial assistance through the Farm Bill and initiatives such as LPCI to implement conservation plans based on standard conservation practice standards and specifications. These conservation practices are developed through a multi-disciplinary science-based process to maximize the success and minimize the risk of failure of the conservation practice. NRCS conservation practice standards are established at the national level and identify the minimum level of planning, designing, installation, operation, and maintenance required. Each conservation practice standard includes a definition and purpose, identifies conditions in which the conservation practice applies, and includes criteria to support each purpose.

Standards in the National Handbook of Conservation Practices are used and implemented by States, as needed, and may be modified to include additional requirements to meet State or local needs because of wide variations in soils, climate, and topography. Conservation practice standards are routinely reviewed and approved by State Technical Committees to ensure that appropriate criteria are included to cover State-specific interests. State laws and local ordinances or regulations may also dictate more stringent criteria; however in no case are the requirements of the national conservation practice standard to be reduced.

Step Down from National to State Standards

The NRCS offices in all five States will meet the minimal national conservation practice standard agreed to in this Opinion consistently. However, States may develop site-specific plans for clients that are more restrictive than the sideboards placed in the standards of this Opinion. A State has the option to work with the State Fish and Wildlife Agency and other credible entities to develop criteria that may further restrict the manner in which a practice is applied based on the best available science.

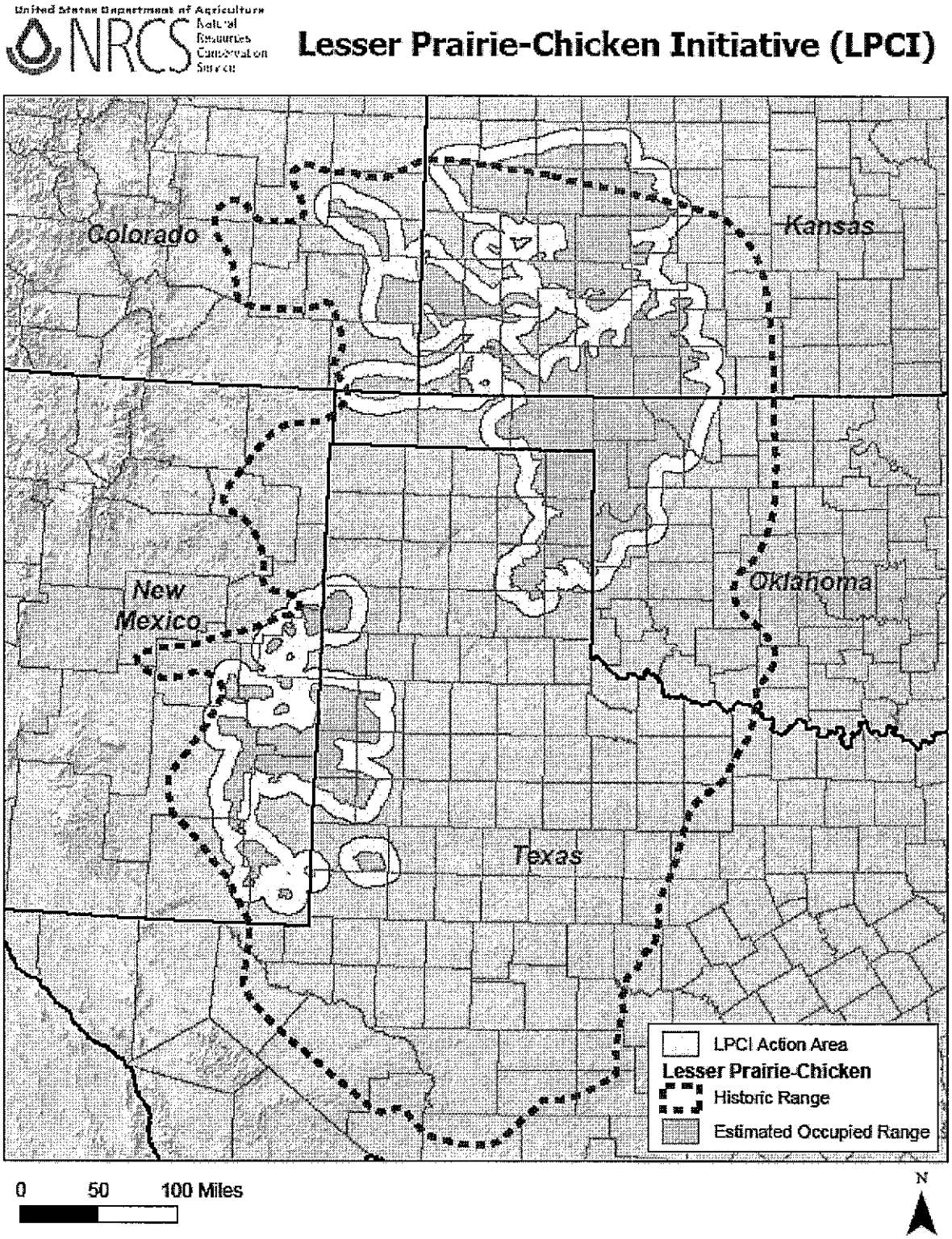
Incorporation of Conservation Measures

Conservation Measures consist of additional criteria to the conservation practice standard that reduce or eliminate the short-term adverse effects because of practice implementation. As a component of the LPCI, the Service and NRCS jointly identified and developed Conservation Measures (Appendix IV). Inherent to the NRCS conservation planning process is the mitigation of potentially negative impacts that may occur to associated resource concerns during the implementation of any conservation practice on the planning unit. However, it is not always possible to manage, control or otherwise mitigate all potentially adverse consequences. In those cases, negative impacts are primarily of a short-term nature associated with installing conservation practices. Where identified, these conservation measures are non-discretionary and manadatory elements and must be used in order to obtain the incidental take coverage in this Biological Opinion. Appendix IV is a comprehensive discussion of the the potential adverse and beneficial effects of each Conservation Practice on the covered species.

LPCI Implementation

The LPCI is structured to facilitate landscape-level improvements across the species' range while recognizing that threats and opportunities differ among ecological zones and within priority areas. Close collaboration of many stakeholders, including local, State, and Federal agencies, tribes, and Non-Governmental Organizations (NGOs), will ensure that NRCS activities complement efforts already underway. The LPCI provides a multi-tiered framework that allows coordination and implementation on a range-wide scale while ensuring input and control over actions in specific States. It is recognized there are sites within the action area that do not provide LPC habitat. In order to better target funding and workload a flow chart (Appendix VII) has been developed to determine when the provisions of this Opinion will be required to be followed as indicated by the presence of LPCs or LPC habitat.

Map 1. Estimated Occupied Range of lesser prairie-chicken with 10 mile buffer



Core conservation practices implemented under the LPCI include Upland Wildlife Habitat (645) as the primary core management practice and Prescribed Grazing (528) as a secondary core management practice needed only when livestock are present. These core practices are required in order to develop landowners' conservation plan that will focus on improving habitat and reducing threats to the LPC. Additional conservation practices may also be required to facilitate the implementation of the core practices. The NRCS planning process emphasizes development of Resource Management Systems (RMS). An RMS is a combination of conservation practices and resource management activities for the treatment of all identified resource concerns for soil, water, air, plants, animals, and humans that meets or exceeds the quality criteria in the Field Office Technical Giude (FOTG) for resource sustainability. The minimum level of treatment to strive for in the planning process is the RMS. Progressive planning is used to work toward an RMS when a client is ready, willing, and able to make some, but not all of the decisions necessary to achieve an RMS level of management. Appendix II contains a description of the NRCS planning process.

NRCS has developed two habitat type LPC Habitat Assessment Tools (e.g., WHEGs) that are utilized by each of the five states encompassed by the LPC range (Appendix II). These tools are completed on-site by a rangeland management specialist and a wildlife biologist. Utilization of these tools on-site facilitates an increase of effectiveness in improving and maintaining habitat. When applying for financial assistance, if a progressive planning approach is utilized, the most limiting factor identified on the WHEG must be the first factor addressed through the conservation contract. Additional supporting practices may be addressed in subsequent applications. NRCS has also worked with partners to develop complimentary prescribed grazing assessment and planning tools, which help in identifying and creating LPC habitat through prescribed grazing. LPCI habitat assessment and prescribed grazing tools document nesting and brood-rearing habitat needs and describe management systems that will target habitat restoration and enhancement based on the LPCI conservation goals.

Implementing Core and Facilitating Practices

All conservation plans developed under the LPCI have Upland Wildlife Habitat Management (645) as the core practice. Implementing LPCI under 645 is essential because this core practice ensures that all other LPCI practices are implemented specifically to benefit LPC populations and their habitats. Implementing LPCI under 645 eliminates the possibility of using practices that exclusively benefit producers, but not LPC. The Upland Wildlife Habitat Management practice standard requires the LPC WHEG be conducted initially on the affected lands and any identified limiting factors to LPC be removed or reduced in their order of significance. The removal of the limiting factors will occur via the contracted conservation practices, this financial assistance to the affected landowners aligned with the requirements of the Conservation Plan. The purpose of the 645 practice is to treat upland wildlife habitat concerns identified during the conservation planning process to (1) provide shelter, cover, and food in proper amounts, locations and times to sustain LPC during all phases of its life cycle, or (2) enable movement. Specific practice standards will be used by NRCS to address the limiting factors to the species and will be implemented to achieve that objective. The identification of the species' limiting factors as well as their respective prioritization for contracting at the individual property owner

level is essential to ensure that the goals of the use of the Upland Wildlife Habitat Management practice are being met under the LPCI.

All LPCI conservation plans will use the core practice of Upland Wildlife Habitat Management (645) and will add Prescribed Grazing (528), when livestock are present, in order to determine which, if any, facilitating conservation practices are needed, as well as the extent, location, and timing of facilitating practices to ensure that LPC habitat is maintained or improved following application. This ensures that grazing systems will be compatible with LPC and the conservation goals and outcomes of the LPCI are being achieved.

NRCS will use a variety of support tools in achieving the implementation of the selected conservation practices under the 645 standard. For example, the LPC Interstate Working Group (i.e., the five State Fish and Wildlife agencies), has developed a range-wide Crucial Habitat Assessment Tool (CHAT) directed at targeting conservation efforts and siting of energy development. Large patches of native prairie and CRP acreage are important LPC habitats, and connections among those patches are also important. Managing for connected landscapes is particularly difficult in private land-dominated landscapes. Accomplishing landscape-level management requires state of the art tools, as well as coordination and engagement of agencies, NGO conservation partners, and industry. The range-wide CHAT accomplishes both objectives for LPC conservation.

The LPC range-wide CHAT incorporates predictive models using information from other modeling efforts to identify landscape-level conservation priorities and strategies across the range of the species, and target conservation funds available through the LPCI.

Core practices are critical to addressing the targeted resource concern(s) for the LPCI and achieving the desired environmental outcome(s). All conservation plans developed using LPCI funding must include documentation that an alternative containing the core practices was presented to the decision maker. Every contract developed under the LPCI must include Upland Wildlife Habitat Management (645). In cases where livestock are present, Prescribed Grazing (528) will be used to support Upland Wildlife Habitat Management. LPCI contracts must be supported by a conservation plan that contains the required core practice(s) and is applied through the conservation contract or associated supporting conservation plan.

Facilitating practices are those practices needed to make the core practices function properly or to address a specific site or condition related to the identified resource concern(s).

Example: All LPCI conservation plans will apply the appropriate LPC WHEG to build the wildlife (LPC) plan under the 645 standard. This will be the primary inventory and assessment that drives the entire LPCI conservation plan. If livestock are present in the system, the prescribed grazing standard (528) will also be required in order to address grazing that will enhance or maintain the habitat needs of LPC. To enable proper implementation of these core conservation practices, additional "facilitating" conservation practices such as obstruction removal, fencing, or prescribed burning may be needed to reach habitat goals for the planned system.

The scope of the action used to estimate incidental take also includes the implementation of conservation practices and associated conservation measures on lands in LPC habitat within the Action Area that are not enrolled in the LPCI (i.e., not exclusive to LPCI or a particular Farm Bill program such as EQIP or WHIP). The essential difference is that on lands not enrolled in LPCI, NRCS will not explicitly design and plan the affected practices using the core practice 645 as explained above. Rather, NRCS will offer technical assistance in the design, planning, and implementation of the selected conservation practice(s) to achieve the landowners' objective(s) which may or may not result in targeted benefits to the LPC. Use of the flow chart (Appendix VII) will determine when conservation measures included in this Opinion are to be applied. If there is potential LPC habitat, as determined by reaching the appropriate designated box on the flow chart, then all conservation measures identified in this Opinion shall be followed when NRCS is providing assistance for any of the included conservation practices. If the red box is reached it will be documented that a determination of no potential to affect has been reached and the provisions of this Opinion will not apply.

The following table (Table 1) lists the Conservation Practice Standards to be used in the LPCI and the corresponding practice type.

Table 1. Conservation Practices Evaluated

Conservation Practice Name (hyperlinks may only be viewable using a Firefox browser)	**Conservation Practice Number**	**Conservation Practice Type**
Upland Wildlife Habitat Management	645	Core Management
Prescribed Grazing	528	Core Supporting Management
Restoration and Management of Rare and Declining Habitats	643	Facilitating Management
Access Control	472	Facilitating Management
Forage Harvest Management	511	Facilitating Management
Prescribed Burning	338	Facilitating Management
Brush Management	314	Facilitating Vegetative
Firebreak	394	Facilitating Vegetative
Cover Crop	340	Facilitating Vegetative
Critical Area Planting	342	Facilitating Vegetative
Forage and Biomass Planting	512	Facilitating Vegetative
Range Planting	550	Facilitating Vegetative
Watering Facility	614	Facilitating Structural
Spring Development	574	Facilitating Structural
Pumping Plant	533	Facilitating Structural
Water well	642	Facilitating Structural
Pipeline	516	Facilitating Structural
Grade Stabilization Structure	410	Facilitating Structural
Fence	382	Facilitating Structural
Obstruction Removal	500	Facilitating Structural
Herbaceous Weed Control	315	Facilitating Vegetative
Pond	378	Facilitating Structural
Tree and Shrub Planting	612	Facilitating Vegetative
Heavy Use Protection	561	Facilitating Structural
Woody Residue Treatment	384	Facilitating Vegetative
Well Decommissioning	351	Facilitating Structural
Conservation Cover	327	Facilitating Vegetative

Conservation Practice Standard: Upland Wildlife Habitat Management (645) (CORE PRACTICE)

Definition: Provide and manage upland habitats and connectivity within the landscape for wildlife.
Purpose: This core management practice will be applied or maintained annually to treat and manage wildlife, in particular LPC resource concerns identified during the conservation planning process. Application of this practice shall remove or reduce habitat limiting factors, in their order of significance, as indicated by results of the LPC wildlife habitat evaluation guide (Appendix II). This practice alone, or in combination with facilitating practices, shall result in a conservation system that will enable the planning area to meet or exceed the minimum quality criteria for upland wildlife habitat.
Resource Concern(s): Factors that reduce habitat quality or otherwise limit population growth of the targeted species.

Conservation Practice Standard: Prescribed Grazing (528) (CORE SUPPORTING PRACTICE)

Definition: Managing the harvest of vegetation with grazing and/or browsing animals.
Purpose: When livestock grazing is present or planned, this practice is applied or maintained annually as a part of a conservation management system to achieve one or more of the following:

A. Improve or maintain desired species composition and vigor of plant communities.
B. Improve or maintain quantity and quality of forage for grazing and browsing animals' health and productivity.
C. Improve or maintain surface and/or subsurface water quality and quantity.
D. Improve or maintain riparian and watershed function.
E. Reduce accelerated soil erosion, and maintain or improve soil condition.
F. Improve or maintain the quantity and quality of food and/or cover available for wildlife.
G. Manage fine fuel loads to achieve desired conditions.
H. Promote economic stability through grazing land sustainability and continued livestock production.

In addition to the purposes above; within the LPCI, this conservation practice standard shall only be selected to support the goals and objectives of core Conservation Practice Standard Upland Wildlife Habitat Management (645). At the individual project and landscape scale, the use of this practice standard under the LPCI is expected to produce a mosaic of vegetation structure and composition to benefit the LPC (e.g., create as needed at the appropriate scale areas of greater forb and resulting insect production, create areas of higher residual cover for nesting birds).
Resource Concern(s): Resource concerns addressed by this practice are lack of diverse species composition and vigor of plant communities, low quantity and quality of forage for grazing and browsing animals, water quality and quantity, soil erosion, quantity and quality of food and/or cover available for wildlife, and economic stability for continued livestock production. Within the LPCI, an additional resource concern is the identification of limiting biological conditions for

the LPC and the creation of a grazing management system to address the limiting biological conditions for the LPC.

Conservation Practice Standard: Restoration and Management of Rare and Declining Habitats (643) (FACILITATING MANAGEMENT PRACTICE)

Definition: Restoring, conserving, and managing unique or diminishing native terrestrial and aquatic ecosystems.
Purpose: This facilitating management practice will be applied annually to those areas of unique or diminishing native terrestrial ecosystems; to restore their original or highest functioning condition. This practice will be used to improve the overall biodiversity of the LPC Action Area.
Resource Concerns: The loss or degradation of rare or declining native habitats.

Conservation Practice Standard: Access Control (472) (FACILITATING MANAGEMENT PRACTICE)

Definition: The temporary or permanent exclusion of animals, people, vehicles, and/or equipment from an area.
Purpose: Prevent, restrict, or control access to an area in order to maintain or improve the quantity and quality of natural resources.
Resource Concern(s): Habitat improvement and/or protection from excessive vehicle, domestic animal or human activities.

Conservation Practice Standard: Forage Harvest Management (511) (FACILITATING MANAGEMENT PRACTICE)

Definition: The timely cutting and removal of forages from the field as hay, green-chop or ensilage.
Purpose: This practice may be applied annually during the forage growing season (summer), to optimize yield and quality of forage at the desired levels; to promote vigorous plant re-growth; to manage for the desired species composition; to remove soil nutrients through uptake and harvest of forage plant biomass; to control insects, diseases and weeds; and to maintain or improve LPC habitat by providing a vigorous plant community with the composition and structure needed for nesting and brood-rearing activities. This practice is most commonly used to manage the timing, frequency, and extent of forage harvest in order to maintain plant production, health and vigor. Within the range of LPC, this practice would primarily be associated with native grass hay production, but could also apply to hay crops such as alfalfa and annually planted forage species.
Resource Concerns: Yield and quality of forage, plant vigor, timing of harvest, insects, diseases and weeds are typical concerns addressed by this practice.

Conservation Practice Standard: Prescribed Burning (338) (FACILITATING MANAGEMENT PRACTICE)

Definition: Controlled fire applied to a predetermined area.
Purpose: Create the desired plant community phase consistent with the ecological site description that is preferable LPC habitat. Control undesirable vegetation or to manipulate desired vegetation. Prepare sites for planting or seeding. Reduce wildfire hazards. Improve wildlife habitat specifically to enhance and produce desirable or needed plant communities for all phases of LPC life cycle. Improve forage production quantity and/or quality. Facilitate distribution of grazing to target the maintenance or creation of desired LPC habitat. Restore and/or maintain ecological sites.
Resource Concerns: Lack of prescribed burning activities results in ecological sites which are vastly different from historic plant communities for LPC and grazing by large ungulates such as livestock. Plant productivity, health, and vigor have been reduced due to a lack of fire. Increased fire return intervals have created a plant community less responsive to prescribed fire and have allowed for invasion of undesirable species such as Eastern Red Cedar and non-native grass species.

Conservation Practice Standard: Brush Management (314) (FACILITATING VEGETATIVE PRACTICE)

Definition: The management or removal of woody (non-herbaceous or succulent) plants including those that are invasive and noxious.
Purpose: To restore or enhance the desired native plant community which is consistent with the ecological site description, and which provides the most suitable habitat for the LPC and other wildlife species. Specifically, it may be used for the purpose of:

- Removing undesirable post-settlement conifers such as juniper, Eastern red cedar or deciduous species such as mesquite and black locust which have encroached into habitats being restored for LPC habitat.

- Improving the diversity of habitat to create a mosaic of irregular shaped grassland openings based on LPC home range, or to provide a release to allow for the native grass and forb community to be expressed.

Resource Concerns: Habitat fragmentation and loss of suitable habitat for the LPC.

Conservation Practice Standard: Firebreak (394) (FACILITATING, VEGETATIVE PRACTICE)

Definition: A permanent or temporary strip of bare or vegetated land planned to retard fire.
Purpose: Reduce the spread of wildfire and contain prescribed burns to their targeted area.
Resource Concerns: The primary concerns that a firebreak addresses are the spread of fire beyond the targeted prescribed burn area and the spread of wildfires, resulting in large-scale,

temporary alteration of the landscape, including unintended harm to LPCs that may occur in the burn area.

Conservation Practice Standard: Cover Crop (340) (FACILITATING VEGETATIVE PRACTICE)

Definition: Crops including grasses, legumes, and forbs for seasonal cover and other conservation purposes.
Purpose: This practice will reduce soil erosion from wind and water, increase soil organic matter content, capture and recycle or redistribute nutrients in the soil profile, promote biological nitrogen fixation, increase biodiversity, weed suppression, provide supplemental forage, soil moisture management, reduce particulate emissions into the atmosphere, minimize and reduce soil compaction. Cover crops are typically used to provide ground cover until the permanent vegetation can be established when converting cropland to grass.
Resource Concerns: The primary resource concerns addressed with the LPCI are wind and water erosion between harvesting of the crop and planting of the native grass. Limited LPC brood rearing habitat between site preparation and full establishment can reduce brood survival.

Conservation Practice Standard: Critical Area Planting (342) (FACILITATING VEGETATIVE PRACTICE)

Definition: Establishing permanent vegetation on sites that have, or are expected to have, high erosion rates, and on sites that have physical, chemical or biological conditions that prevent the establishment of vegetation with normal practices.
Purpose: This practice is applied as needed in order to stabilize erosion by the establishment of native and/or non-invasive vegetation in areas with disturbed soil from installation of other practices, such as grade stabilization structures or from long-term damage caused by oil and gas activities.
Resource Concerns: Un-vegetated, disturbed soil creates sites for invasive plant species to colonize, promotes increased soil erosion, and reduces wildlife habitat quality.

Conservation Practice Standard: Forage and Biomass Planting (512) (FACILITATING VEGETATIVE PRACTICE)

Definition: Establishing adapted and/or compatible species, varieties, or cultivars of herbaceous species suitable for pasture, hay, or biomass production.
Purpose: This practice may be applied as needed to improve or maintain livestock nutrition and health, to provide or increase forage supply during periods of low forage production, to reduce soil erosion, improve soil and water quality, and to produce feedstock for bio-fuel or energy production. Within the Action Area, this practice is typically used to convert croplands to perennial grass and legume mixtures to increase forage hay production and grazing for livestock. More recently, some plantings have been established for the purpose of producing and harvesting biomass for fuels and energy.

Resource Concerns: This practice is most commonly used to convert cropland fields to permanent vegetative cover to prevent soil loss, improve soil conditions, improve wildlife cover, and improve water quality and quantity. This practice also addresses needs for adequate food for livestock and under the LPCI will provide adequate food for the LPC.

Conservation Practice Standard: Range Planting (550) (FACILITATING VEGETATION PRACTICE)

Definition: Establishment of adapted perennial or self-sustaining vegetation such as grasses, forbs, legumes, shrubs and trees.
Purpose: Applied to restore the native plant community to a condition similar to the ecological site description reference state for the site, provide or improve forages for livestock and browse or cover for wildlife, reduce erosion by wind and/or water, improve water quality and quantity, and increase carbon sequestration. This practice is used to restore important native habitats by converting cropland to grasslands, to meet habitat requirements for LPC.
Resource Concerns: This practice is most commonly used to convert cropland fields to permanent vegetative cover to prevent soil loss, improve soil conditions, and improve water quality and quantity and create habitat for LPC. Cropland sites typically provide inadequate food and cover for LPC and other grassland species.

Conservation Practice Standard: Watering Facility (614) (FACILITATING STRUCTURAL PRACTICE)

Definition: A permanent or portable device to provide an adequate amount and quality of drinking water for livestock and/or wildlife.
Purpose: To provide access to drinking water for livestock and/or wildlife in order to meet daily water requirements and improve animal distribution. This practice will be applied in the Action Area to facilitate prescribed grazing (528) by providing access to drinking water for livestock in order to meet daily water requirements and improve animal distribution to conserve or enhance important LPC habitat.
Resource Concerns: The inability to provide adequate water supplies and to properly locate water supplies throughout grazing units can reduce the opportunity to manage livestock grazing distribution. As a result, forage may be over or under-utilized with resulting impacts on range health, livestock production and associated wildlife habitat. Livestock may be disproportionately concentrated near a water source and overgraze the surrounding area to the point where food producing forbs and legumes are eliminated, residual grasses are inadequate for nesting cover, and protective cover provided by shrubs is reduced due to heavy browsing. Conversely, areas more distant from a water supply may be underutilized and in the absence of disturbance, the health and vigor of grasses for livestock grazing and the value of the habitat for LPC may be diminished through plant succession.

Conservation Practice Standard: Spring Development (574) (FACILITATING STRUCTURAL PRACTICE)

Definition: Collection of water from springs or seeps to provide water for a conservation need.
Purpose: Spring developments will be applied to improve the quantity and quality of water for livestock and wildlife or other agricultural uses. This practice will be used to facilitate prescribed grazing to improve water quality, reduce erosion, protect sensitive areas, and/or improve mesic habitat quality for LPC and broods.
Resource Concerns: The inability to provide adequate water supplies and to properly locate water supplies throughout grazing units can reduce the opportunity to manage livestock grazing distribution. As a result, forage may be over or under-utilized with resulting impacts on range health, livestock production and associated wildlife habitat. Livestock may be disproportionately concentrated near a water source and overgraze the surrounding area to the point where food producing forbs and legumes are eliminated, residual grasses are inadequate for nesting cover, and protective cover provided by shrubs is reduced due to heavy browsing. Conversely, areas more distant from a water supply may be underutilized and in the absence of disturbance, the health and vigor of grasses for livestock grazing and the value of the habitat for LPC may be diminished through plant succession.

Conservation Practice Standard: Pumping Plant (533) (FACILITATING STRUCTURAL PRACTICE)

Definition: A facility that delivers water at a designed pressure and flow rate. Includes the required pump(s), associated power unit(s), plumbing, appurtenances, and may include on-site fuel or energy source(s), and protective structures.
Purpose: This practice can achieve delivery of water to livestock watering facilities to facilitate prescribed grazing of livestock in a way that promotes rangeland sustainability and improves wildlife and LPC habitat.
Resource Concerns: The inability to provide adequate water supplies and to properly locate water supplies throughout grazing units can reduce the opportunity to manage livestock grazing distribution. As a result, forage may be over or under-utilized with resulting impacts on range health, livestock production and associated wildlife habitat. Livestock may be disproportionately concentrated near a water source and overgraze the surrounding area to the point where food producing forbs and legumes are eliminated, residual grasses are inadequate for nesting cover, and protective cover provided by shrubs is reduced due to heavy browsing. Conversely, areas more distant from a water supply may be underutilized and in the absence of disturbance, the health and vigor of grasses for livestock grazing and the value of the habitat for LPC may be diminished through plant succession.

Conservation Practice Standard: Water Well (642) (FACILITATING STRUCTURAL PRACTICE)

Definition: A hole drilled, dug, driven, bored, jetted or otherwise constructed to an aquifer for water supply.

Purpose: This practice will be applied to provide water for livestock to facilitate proper use of vegetation through grazing distribution and to provide alternative sources of livestock water to meet the daily animal requirements. The water provided by the well is also used as a part of a watering system that includes watering facilities, pipeline and pumping plant.
Resource Concerns: The inability to provide adequate water supplies and to properly locate water supplies throughout grazing units can reduce the opportunity to manage livestock grazing distribution. As a result, forage may be over or under-utilized with resulting impacts on range health, livestock production and associated wildlife habitat. Livestock may be disproportionately concentrated near a water source and overgraze the surrounding area to the point where food producing forbs and legumes are eliminated, residual grasses are inadequate for nesting cover, and protective cover provided by shrubs is reduced due to heavy browsing. Conversely, areas more distant from a water supply may be underutilized and in the absence of disturbance, the health and vigor of grasses for livestock grazing and the value of the habitat for LPC and other wildlife may be diminished through plant succession. These potential impacts on livestock grazing and wildlife habitat need to be considered when planning wells and other water supply sources.

Conservation Practice Standard: Pipeline (516) (FACILITATING STRUCTURAL PRACTICE)

Definition: Pipeline having an inside diameter of 8 inches or less.
Purpose: The purpose of this practice is to convey water from a source of supply to points of use for livestock, wildlife, or recreational purposes. Typically, the water conveyed by a pipeline originates from a well, spring, or in some cases, ponds and streams. The practice is most commonly used to facilitate proper use of vegetation through grazing distribution, to meet the daily water requirements of livestock, or to provide alternative sources of livestock water away from streams and aquatic habitats.
Resource Concerns: The inability to provide adequate water supplies and to properly locate water supplies throughout grazing units can reduce the opportunity to manage livestock grazing distribution. As a result, forage may be over or under-utilized with resulting impacts on range health, livestock production and associated wildlife habitat. Livestock may be disproportionately concentrated near a water source and overgraze the surrounding area to the point where food producing forbs and legumes are eliminated, residual grasses are inadequate for nesting cover, and protective cover provided by shrubs is reduced due to heavy browsing. Conversely, areas more distant from a water supply may be underutilized and in the absence of disturbance, the health and vigor of grasses for livestock grazing and the value of the habitat for LPC may be diminished through plant succession.

Conservation Practice Standard: Grade Stabilization Structure (410) (FACILITATING STRUCTURAL PRACTICE)

Definition: A structure used to control the grade and head cutting in natural or artificial channels.

Purpose: This practice may be applied to stabilize the grade and control erosion in natural or artificial channels; to prevent the formation or advance of gullies, restore associated hydrology to surrounding lands, and to enhance environmental quality by reducing siltation or pollution hazards.
Resource Concerns: Erosion control.

Conservation Practice Standard: Fence (382) (FACILITATING STRUCTURAL PRACTICE)

Definition: A constructed barrier to animals or people.
Purpose: This practice facilitates the accomplishment of conservation objectives by providing a constructed means to control movement of animals and people, including vehicles. The need and extent of this practice is determined based on the particular management practice it facilitates, such as prescribed grazing or access control.
Resource Concerns: The concerns typically addressed by a constructed fence are plant health and vigor, soil erosion and condition, livestock health and vigor and wildlife habitat needs.

Conservation Practice Standard: Obstruction Removal (500) (FACILITATING STRUCTURAL PRACTICE)

Definition: Removal and disposal of buildings, structures, other works of improvement, vegetation, debris or other materials.
Purpose: This practice may be applied to remove and dispose of unwanted obstructions in order to apply conservation practices or facilitate the planned land use. The practice will be used to decrease availability of predator nests, dens, and perches, and reduce habitat fragmentation.
Resource Concerns: Structures, including buildings, power poles, and fences can provide predator perches and nesting sites and can increase predation rates for wildlife including LPC and may cause wildlife to decrease use of otherwise suitable habitats. Additionally, these structures, particularly fences, can cause accidental mortality from collisions and can contribute to habitat fragmentation for LPC.

Conservation Practice Standard: Herbaceous Weed Control (315) (FACILITATING VEGETATIVE PRACTICE)

Definition: The removal or control of herbaceous weeds including invasive, noxious and prohibited plants.
Purpose: This practice may be applied to control or remove invasive and noxious weeds through chemical, biological, or mechanical means in order to restore native or desired plant communities and habitat for LPC consistent with the ecological site description. It secondarily protects soils, controls erosion, reduces fine-fuels fire hazards, and improves air quality.

Resource Concerns: Invasive and noxious weeds degrade ecological sites by increasing competition with native and desirable plant species. This results in decreased sustainability and resiliency of the ecological sites and leads to reduced habitat quality and quantity for wildlife, including LPC.

Conservation Practice Standard: Pond (378) (FACILITATING STRUCTURAL PRACTICE)

Definition: A water impoundment made by constructing an embankment or by excavating a pit or dugout. In this standard, ponds constructed by the first method are referred to as embankment ponds, and those constructed by the second method are referred to as excavated ponds. Ponds constructed by both the excavation and the embankment methods are classified as embankment ponds if the depth of water impounded against the embankment at the auxiliary spillway elevation is 3 feet or more.
Purpose: The purpose of this practice is to provide water for livestock, fish and wildlife, recreation, fire control, and other related uses and to maintain or improve water quality.
Resource Concerns: The inability to provide adequate water supplies and to properly locate water supplies throughout grazing units can reduce the opportunity to manage livestock grazing distribution. As a result, forage may be over or under-utilized with resulting impacts on range health, livestock production and associated wildlife habitat. Livestock may be disproportionately concentrated near a water source and overgraze the surrounding area to the point where food producing forbs and legumes are eliminated, residual grasses are inadequate for nesting cover, and protective cover provided by shrubs is reduced due to heavy browsing. Conversely, areas more distant from a water supply may be underutilized and in the absence of disturbance, the health and vigor of grasses for livestock grazing and the value of the habitat for LPC may be diminished through plant succession.

Conservation Practice Standard: TREE/SHRUB ESTABLISHMENT (612) (FACILITATING VEGETATIVE PRACTICE)

Definition: Establishing woody plants by planting seedlings or cuttings, direct seeding, or natural regeneration.
Purpose: To restore or enhance the desired native shrub community that is consistent with the ecological site description and as recommended by the affected State Fish and Wildlife Agency that identifies the most suitable habitat for the LPC and other wildlife species. Specifically, conservation practice 612 may be used for the purpose of:

1) Providing vertical and thermal cover.
2) Improving the diversity of habitat to create a wider suite of food options that are available throughout the LPC's life cycle.
3) Increasing food availability during heavy snow events.

Resource Concerns: Wildlife habitat, specifically increased over-winter food, vegetative structure, and thermal cover for LPC.

Conservation Practice Standard: Heavy Use Area Protection (561) (FACILITATING STRUCTURAL PRACTICE)

Definition: The stabilization of areas frequently and intensively used by people, animals, or vehicles by establishing vegetative cover, surfacing with suitable materials, and/or installing needed structures.
Purpose: To provide a stable, non-eroding surface for areas frequently used by animals, people, or vehicles that will protect and improve water quality. This practice will be used in conjunction with Conservation Practice 614 (Watering Facility).
Resource Concerns: The inability to provide adequate water supplies and to properly locate water supplies throughout grazing units can reduce the opportunity to mange livestock grazing distribution. As a result, forage may be over or under-utilized with resulting impacts on range health, livestock production and associated wildlife habitat. Livestock may be disproportionately concentrated near a water source and overgraze the surrounding area to the point where food producing forbs and legumes are eliminated, residual grasses are inadequate for nesting cove r, and protective cover provided by shrubs is reduced due to heavy browsing. Conversely, areas more distant from a water supply may be underutilized and in the absence of disturbance, the health and vigor of grasses for livestock grazing and the value of the habitat for LPC may be diminished through plant succession. Without proper protection in the area immediately surrounding the tank, this area will become prone to erosion and water quality concerns.

Conservation Practice Standard: Woody Residue Treatment (384) (FACILITATING Vegetative PRACTICE)

Definition: The treatment of residual woody material that is created due to management activities or natural disturbances.
Purpose: Improve access to forage for livestock and wildlife
Resource Concerns: The standing dead carcasses of woody species remaining after chemical, fire, or other control methods continue to present a barrier to LPC area use. These carcasses present roost areas for predator species, visual obstructions, and flight obstructions. It is important these carcasses are removed to provide an opportunity for LPC to recolonize acres where brush management has been completed. Treatments must be accomplished by methods allowing for the safe and proper removal of residue carcasses.

Conservation Practice Standard: Well Decommissioning (351) (FACILITATING STRUCTURAL PRACTICE)

Definition: The sealing and permanent closure of a water well no longer in use.
Purpose: This practice is applied to prevent entry of animals, debris or other foreign substances into well or well bore hole; to eliminate the physical hazard of an open hole to people, animals, and farm machinery; prevent entry of contaminated surface water into well and migration of contaminants into unsaturated (vadose) zone or saturated zone; prevent commingling of chemically or physically different ground waters between separate water bearing zones; eliminate possibility of well being used for any other purpose; conserve yield and hydrostatic

head of aquifers; and restore, as far as feasible, hdrogeologic conditions that existed before well was constructed.
Resource Concerns: This practice will be applied to abandoned water wells on rangeland sites in LPC range. Failure to properly decommission a water well could cause resource concerns related to water quality, grazing animals, and human activity.

Conservation Practice Standard: Conservation Cover (327) (FACILITATING VEGETATION PRACTICE)

Definition: Establishing and maintaining permanent vegetative cover.
Purpose: This practice shall be applied to reduce soil erosion and sedimentation, improve water quality, improve air quality, enhance wildlife habitat and pollinator habitat, improve soil quality, and manage plant pests. Special considerations will be given to planting species mixes that will provide LPC habitat requirements.
Resource Concerns: This practice is most commonly used to convert cropland fields to permanent vegetative cover to prevent soil loss, improve soil conditions, and improve water quality and quantity and create habitat for LPC. Cropland sites typically provide inadequate food and cover for LPC and other grassland species.

Science Support, Monitoring and Assessment

NRCS has retained a science advisor to ensure that the LPCI's science support elements are implemented in a technically sound manner and monitoring efforts are scientifically valid. This advisor is helping design studies, implement field-based assessments, and foster rigorous science through the peer-review process for publication in leading scientific journals. The advisor also acts as a point of contact for reporting of short- and long-term Initiative results to scientific and lay audiences.

NRCS and partners will conduct assessments to measure the biological response of LPC populations to conservation practices, assess the effectiveness of implementing conservation practices and measures, and adaptively improve program implementation each year. The five states have been monitoring and tracking lek (breeding) sites while conducting LPC population surveys. Monitoring and tracking will continue through the efforts of State and Federal wildlife agencies. Additional details can be found in Appendix III.

Training

NRCS has conducted training sessions in the five States to assist staff, partners, and clients to become better managers of LPC habitats, and has also worked with other partners to reach the public with the latest information on LPC conservation and the programs available to assist land owners. These efforts have resulted in a raised awareness of the importance in conserving this species as well as increasing implementation of conservation systems that have maintained and improved LPC habitat.

The Service and NRCS will host at least one rangewide training event focused on implementation of this Opinion, as well as meet at least annually to evaluate the relevancy and adequacy of the effort.

Also, NRCS plans to continue to provide for training needs with annual rangewide training sessions planned to update states on new developments and updated information.

Delivery of Technical Assistance

As part of an effort to provide targeted technical assistance to accelerate implementation of conservation practices that will enhance and maintain LPC habitats, NRCS has entered into contribution agreements with partners to provide on-the-ground rangeland and LPC habitat management assistance using Strategic Watershed Action Team (SWAT) funds. Staff positions funded through SWAT assist in conducting range and habitat inventories, implementing grazing plans, and evaluating range health and habitat expansion. The team will conduct outreach, assist in monitoring and evaluation, and support NRCS efforts to evaluate the effects of conservation practices on the LPC. The strong base of support provided by the SWAT positions and other partner efforts has provided for an extensive network of technical knowledge and assistance available to land owners and managers in LPC range.

Funding

NRCS has been committed to the effort since 2010, having invested over $80 million in conservation efforts for the LPC. Funding has been and will likely continue to be available via congressional appropriations contained in the 2014 Agricultural Act (2014 Farm Bill).

Predictability and Working Lands for Wildlife

Working Lands for Wildlife (WLFW) is a collabrative partnership between the Service and NRCS that strategically targets technical and financial assistance to improve habitat for declining species while also offering predictability (up to 30 years) for participating producers who continue to implement their conservation practices and associated conservation measures according to their conservation plan. Working Lands for Wildlife is a practice-based approach versus a programmatic approach to conservation. Landowner predictability and conservation measures apply regardless of the NRCS program funding.

The WLFW partnership currently includes seven species, including the lesser prairie-chicken, greater sage-grouse, gopher tortoise, bog turtle, southwestern willow flycatcher, New England cottontail, and golden-winged warbler. A key component of this partnership is the cooperative development of programmatic consultation documents (Conference Reports, Conference Opinions, Biological Opinions and other consultation documents) under Section 7 of the ESA, in which the Service and NRCS evaluate the effects of implementing certain conservation practices and associated conservation measures designed to produce long-term benefits for the species and their habitats, while helping to sustain healthy working lands. This Biological Opinion, which is based on the Conference Report and subsequent Conference Opinion for the LPCI completed in

June 2011 and amended in November 2013, constitutes the programmatic consultation for the LPC under WLFW, because WLFW participants must use the same LPCI planning process, conservation practices and conservation measures described in this Opinion.

Consistent with an agreement between the Service and NRCS, described in an exchange of letters in August, 2012 (Appendix VIII), the Service has prepared this Biological Opinion for NRCS under Section 7 of the ESA. This will exempt any incidental take associated with implementing the specified conservation practices and measures included in the WLFW conservation plan. Recognizing that continued implementation of the conservation practices by participating producers beyond the term of the NRCS contract would advance the longer-term goals of WLFW and both agencies missions, the Service is evaluating the effects of implementing the specified practices over a 30-year period. Producers who choose to use or maintain the conservation practices and associated conservation measures included in the WLFW conservation plan will have the predictability of knowing that ESA issues associated with their implementation of the specified conservation practices for up to 30 years have already been addressed. NRCS had developed a protocol to track landowner participation in the LPCI and will be providing this information as a component of its annual report. Ongoing as well as new WLFW accomplishments are bundled and reported to the Service annually.

STATUS OF THE SPECIES

Status of the Species is an analysis of appropriate and best available scientific information on the species' life history, habitat and distribution, and other data on factors related to its survival and recovery. This analysis considers the effects of past human and natural activities or events that have led to the current condition of the species.

The action area is the estimated occupied range, with a 10 mile buffer, of the LPC within Colorado, Kansas, Texas, New Mexico, and Oklahoma (Map 1). We are including only a summary of the status of the species. For detailed information on the status of the species, including species habitat description, life history, population dynamics, status and distribution, and analysis of the existing threats and conservation challenges to the species, refer to the proposed rule to list the LPC as a Threatened species published in the Federal Register on December 11, 2012 (77FR73828) and the documents listed in the Literature Cited section.

Species Description and Life History

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

(Johnsgard 1973, p. 275; Johnsgard 1983, p. 318), and body mass varies from 734 to 813 grams (g) (1.6 to 1.8 pounds (lbs)) for males and 628 to 772 g (1.4 to 1.7 lbs) for females (Giesen 1998, p. 14).

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

LPCs are polygynous and exhibit a lek mating system using leks where males traditionally gather to conduct a communal, competitive courtship display using their specialized plumage and vocalizations to attract females for mating. Males exhibit strong site fidelity to their display grounds (Copelin 1963, pp. 29–30; Hoffman 1963, p. 731; Campbell 1972, pp. 698–699) whereas females, due to their tendency to nest within 2.5 km (1.5 mi) of a lek (Giesen 1994a, p. 97), also may display fidelity to nesting areas but the degree of fidelity is not clearly established (Schroeder and Robb 2003, p. 292). However, Haukos and Smith (1999, p. 418) observed that female LPCs are more likely to visit older, traditionally used lek sites than temporary, nontraditional lek sites (those used for no more than 2 years).

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

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

Nests generally consist of bowl-shaped depressions in the soil (Giesen 1998, p. 9) and are lined with dried grasses, leaves, and feathers. Adequate herbaceous cover, including residual cover from the previous growing season, is an important factor influencing nest success, primarily by providing concealment of the nest (Suminski 1977, p. 32; Riley 1978, p. 36; Riley *et al.* 1992, p. 386; Giesen 1998, p. 9).

LPCs have a relatively short lifespan and high annual mortality. Campbell (1972, p. 694) estimated a 5-year maximum lifespan, although an individual nearly 7 years old has been documented in the wild by the Sutton Avian Research Center (Sutton Center) (Wolfe 2010).

Historic and Current Distribution

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

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

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

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

enrollments that were initially seeded with native grasses (Rodgers and Hoffman 2005, pp. 122–123). The estimated current occupied range, based on cooperative mapping efforts described above, and as derived from calculations of the area of each mapped polygon using geographical information software, represents about an 84 percent reduction in overall occupied range since pre-European settlement.

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

In 2013, the surveys were repeated and results indicate a range-wide population estimate of 17,616 birds constituting a 49% decline from the 2012 estimate, and 2,036 leks constituting a 30% decline from 2012.

Reasons for Decline and Threats to Survival

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

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

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

Grazing, haying and mowing can contribute to increased predation as well by reducing grass height LPCs have historically relied upon for food and cover. If these activities are applied at an inappropriate frequency, intensity, time, or duration across a larger landscape, the collective

effect of loss of cover (to hide from predators), thermal cover (to stay warm in the winter), and reduced food sources can result in significant harm to local populations.

Range-wide Survival and Recovery Needs

In order to address the long-term conservation of the LPC, the Service suggests implementation of four overarching management goals to address the three primary challenges facing the species. The four management goals are described in detail in a Service technical white paper (Appendix IX) and include establishing strongholds, ensuring connectivity, committing to implementation, and providing long-term certainty.

ENVIRONMENTAL BASELINE

The environmental baseline includes past and present impacts of all Federal, state, or private actions in the action area; the anticipated impacts of all proposed Federal actions in the action area that have undergone formal or early section 7 consultation; and the impact of state and private actions which are contemporaneous with the consultation process. The environmental baseline defines the current status of the species and its habitat in the action area to provide a platform to assess the effects of the action now under this Opinion.

The following includes detailed information on the actions implemented through the LPCI from 2010 through the current time. For a summary of recent and ongoing conservation actions implemented through other Federal, State or private actions for the benefit of the LPC within the Action Area, refer to the final rule listing the LPC as a Threatened species published in the Federal Register on March 27, 2014 (79 FR 20074). The rule also summarizes the factors affecting the species within the Action Area.

EFFORTS TO DATE

WAFWA Range-wide Plan

Over the past several years the LPC Interstate Working Group and the Western Association of Fish and Wildlife Agencies (WAFWA) have collaborated in an effort to develop the Lesser Prairie-Chicken Range-Wide Conservation Plan (VanPelt et al. 2013). This conservation plan encompasses portions of all five States within the estimated occupied range of the LPC. In October of 2013; the USFWS determined that this plan, when fully implemented, would provide a net conservation benefit for the LPC and subsequently endorsed the plan (Ashe 2013).

The plan is a voluntary conservation strategy that uses a mitigation framework, administered through WAFWA, which allows plan participants the opportunity to mitigate any unavoidable impacts of a particular development activity on the LPC. Financial incentives would be provided to landowners who voluntarily participate and manage their property for the benefit of the LPC. Development activities that would be covered under the plan include oil and gas development (seismic and land surveying, construction, drilling, completion, workovers, operations and maintenance, and remediation and restorations activities), agricultural activities (brush management, building and maintaining fences and livestock structures, grazing, water/windmills, disturbance practices, and crop production), wind power, cell and radio towers, power line

activities (construction, operations and maintenance, and decommissioning and remediation), road activities (construction, operation and maintenance, and decommissioning and remediation), and finally general activities (hunting, off-highway vehicle activity, general construction and other land management) all of which are further defined within the plan.

Range-wide and regional population goals for the LPC are identified in the plan, with an overall goal of 67,000 birds, based on the annual spring average over a 10-year time frame. Principles of adaptive management have been incorporated into the plan to facilitate refinement of the conservation strategy over time should the needs of the species change during implementation. The plan also identifies specific monitoring and research needs to ensure the conservation strategy remains sound and the plan is being implemented effectively. Additionally, the plan encourages implementation of a number of conservation measures designed to avoid, offset, or minimize anticipated impacts of proposed developments. The specific language for each of the identified measures is provided in more detail within the plan. The plan estimated the number of LPC that could be adversely impacted by plan implementation over the30-yearlife of the plan. Based on the estimates of future impacts provided in the plan, future potential take resulting from implementation of the projected development activities, including oil and gas development, construction and operation of communication towers, wind energy and transmission line development and construction and operation of primary and secondary roads would be between 600 to 700 birds annually. However the plan is expected to provide an overall net conservation benefit for the LPC. In order to achieve the conservation goals established in the plan, LPC populations would be required to increase, on average, by several thousand annually, depending on population growth realized in any given year. For example, the 10 year average rangewide population goal established by the plan is 67,000 birds. Presuming that current rangewide LPC abundance has increased slightly to about 18,000 birds, the LPC population would have to increase by an average of 4,900 birds annually to meet the target established by the plan. Although the effectiveness of the plan has not yet been demonstrated, we have no evidence which would indicate that the plan would not be effective and realize at least a small net increase in conservation benefit annually. The estimated annual take of 600 to 700 birds associated with implementation this plan is roughly 4 percent of the current rangewide population estimate of 17,615 birds (McDonald et al. 2014).

Range-wide Oil and Gas Industry CCAA

On February 28, 2014, the USFWS signed the Range-wide Oil and Gas Industry Candidate Conservation Agreement with Assurances for the LPC in association with the Lesser Prairie-Chicken Range-Wide Conservation Plan (WAFWA Plan) discussed above. This Oil and Gas Industry CCAA incorporates measures to address impacts to the LPC from oil and gas activities on voluntarily enrolled non-federal lands. Participants will be required to pay mitigation fees when undertaking certain actions that impact the lesser prairie-chicken or its habitat. Funds generated through these fees will enable implementation of conservation actions on enrolled lands elsewhere. The mitigation fee structure and conservation actions in this Oil and Gas Industry CCAA follow recommendations contained in the WAFWA Plan. Accordingly, the incidental take associated with this CCAA and related Enhancement of Survival Permit that would authorize the anticipated take, was estimated to be 8,530 birds over the 30-year life of the CCAA. The annual take would be, on average, about 284 birds or about 1.6 percent of the current population estimate of 17,615 birds. However, the incidental take from this CCAA is

considered compensatory as the take of these birds were already anticipated from implementation of the WAFWA Plan.

CRP Conservation Accomplishments
Approximately 5 million acres are currently enrolled in CRP within the 85 county Action Area considered in the FSA BO and 4 million of those acres were established as native covers. Land enrolled in CRP accounts for approximately 25 percent of the acreage contained within the LPC occupied range and 32 percent of the designated LPC focal area/connectivity/expansion zones. It is important to look at the quality and quantity of CRP cover relative to the known occupied range and proximity to leks and preferred seasonal habitats.

It is estimated that about 80 percent of CRP enrollment within the occupied range of LPC were originally established to or have since been converted through program re-enrollment to native covers. Looking at the CRP enrollment in native grass practices versus total CRP enrollment within the LPC occupied range can be used as a qualitative measure. Comparing CRP enrollment within focal areas, connectivity, and expansion zones against CRP enrollment within the LPC eco-regions derives a simple quantitative measure. Approximately 67 percent of CRP enrollment within the occupied range of the LPC is located within designated eco-regions and 46 percent within CHAT 1, CHAT 2, and CHAT 3 category designations.

In addition, the following continuous CRP Initiatives are also occurring:

CRP Wetland Restoration, Non-floodplain Initiative (Announced in 2005) – Initiative is designed to restore wetlands and playa lakes that are located outside the 100-year floodplain. This 350,000 acre initiative provides habitat for many wildlife species, filters runoff, recharges groundwater supplies and sequesters carbon. Currently 225,676 acres across the country are under CRP contracts that include establishment of the CP23A Non-floodplain Wetland Restoration practice. Among the LPC States, Kansas and Oklahoma have the most participation in the CP23A practice, with Kansas having 4,150 acres enrolled and Oklahoma having 1,660 acres enrolled.

Habitat Buffer for Upland Birds Initiative (Announced in 2005) - Initiative is aimed at creating 500,000 acres of habitat for the northern bobwhite and other grassland dependent birds by creating early successional grass buffers along agricultural field borders. Planting such buffers will also benefit reptiles, amphibians, and upland birds, many of which are being considered for listing as threatened or endangered species. In addition, the initiative will reduce soil erosion and protect water quality by trapping field sediments and nutrients. Among the LPC States, Kansas, Texas, and Oklahoma have the most participation in the CP33 Upland Bird Habitat Buffer practice, with Kansas having 40,407 acres, Texas having 4,800 acres, and Oklahoma having 1,054 acres, enrolled.

State Acres for Wildlife Enhancement (SAFE) (Announced in 2007) – A continuous CRP initiative to improve habitat for high priority wildlife species throughout the United States. It is a locally-led, results-oriented cooperative conservation effort. State fish and wildlife agencies, non-profit organizations and other conservation partners work collaboratively with FSA to target CRP delivery to specific conservation practices and geographic areas where enrollment of

eligible farm land in continuous CRP will provide important wildlife value. FSA in cooperation with appropriate state fish and wildlife agencies and other conservation partners monitor SAFE and manage available acres to ensure that CRP goals and objectives are being met. To encourage landowner participation in SAFE, new land entering CRP is offered additional financial incentives through SIP and PIP. Expiring general CRP acres with existing introduced grass cover re-enrolled into continuous CRP through SAFE and requiring cover upgrades are eligible for PIP. Currently there are 1,250,000 acres of CRP enrollment distributed among 97 projects nationwide allocated to SAFE. A total of 214,000 acres have been allocated among the five CP38 SAFE projects focused on LPC - Colorado (21,500 acres), Kansas (52,100 acres), New Mexico (2,600 acres), Oklahoma (15,100 acres), and Texas (122,700 acres). Acres offered to SAFE LPC projects as of October, 2013, included 20,515 acres in Colorado; 37,951 acres in Kansas; 2,600 acres in New Mexico; 7,813 acres in Oklahoma; and 103,157 acres in Texas. Out of the acres offered, actual acres under CRP contract as a result of SAFE LPC project participation stood at 13,488 acres (Colorado); 32,680 acres (Kansas); 2,600 acres (New Mexico); 6,965 acres (Oklahoma); and 78,565 acres (Texas) as of October, 2013. The difference between acres offered and acres under contract are those CRP offers which are currently being evaluated and processed. There can be several months between when an offer is made and a contract is actually approved and becomes active.

CRP Highly Erodible Land Initiative (Announced in February 2012) - seeks to protect the nation's most environmentally sensitive lands by permitting landowners to enroll up to 750,000 acres of land with an Erodibility Index (EI) of 20 or greater in CRP. Such land can be offered for enrollment in CRP on a continuous basis, however, no SIP or PIP is provided as additional financial assistance. Between general and continuous signups, a total of 475,300 acres of highly erodible cropland of EI of 20 or greater are currently enrolled in CRP and established to conservation cover (159,814 acres in Texas, 114,117 acres in New Mexico, 96,699 acres in Kansas, 67,993 acres in Oklahoma, and 36,678 acres in Colorado). Based on land cover and highly erodible land data, the Playa Lakes Joint Venture estimates that there are approximately 689,000 acres of land with an EI of 20 or greater still being cropped within the current estimated occupied range of the LPC (46 percent of which is estimated to be located within identified LPC focal areas and connectivity and expansion zones).

Pollinator Habitat Initiative (Announced In 2012) - The CP42 Pollinator Habitat practice assists producers in establishing conservation covers that benefit honey bees and native pollinators throughout the growing season. Native pollinators include a wide range of insects including bees, beetles, butterflies, and moths, as well as birds. This 100,000 acre initiative seeks to encourage and support a diverse group of pollinators through the establishment of a diverse stand of native grasses and wildflowers. Among the LPC States, Texas, Colorado and Kansas have had the most interest in the CP42 practice, with Texas having 10,522 acres, Colorado having 10,215 acres, and Kansas having 1,389 acres, enrolled.

Oil and Gas CCAA - tied to RWP

Oil and gas companies voluntarily enrolled to receive incidental take coverage to offset development impacts by funding conservation actions on their lands to benefit the LPC. If the enrolled participants continue to implement their conservation actions they will not be required to implement additional measures.

New Mexico CCA/CCAA
Oil and gas companies voluntarily enrolled to receive incidental take coverage to offset development impacts by funding conservation actions on their lands to benefit the LPC. Landowners that voluntarily enrolled in the CCAA will receive incidental take coverage for agricultural practices by implementing conservation actions on their lands to benefit the LPC. If the enrolled participants continue to implement their conservation actions they will not be required to implement additional measures. Through a Conference Opinion on the CCA involving BLM, Oil and Gas participants will have incidental take coverage post-listing on their enrolled acres.

Texas CCAA
Landowners that voluntarily enrolled in the CCAA will receive incidental take coverage for agricultural practices by implementing conservation actions on their lands to benefit the LPC and as long as enrolled participants continue to implement their conservation actions, they will not be required to implement additional measures.

Oklahoma CCAA
Landowners that voluntarily enrolled in the CCAA will receive incidental take coverage for agricultural practices by implementing conservation actions on their lands to benefit the LPC and as long as the enrolled participants continue to implement their conservation actions, they will not be required to implement additional measures.

With regard to other programs that have been implemented that may also result in incidental take of LPCs, the following table (Table 1) represents a summary of available estimated incidental take for all known actions approved by the Service that may result in additive adverse effects to LPCs rangewide. Incidental take authorized by the rangewide oil and gas CCAA issued February 28, 2014, is contemplated by the WAFWA RWP estimate and therefore is compensatory and will not be included in the total tallied below. Some programs, although authorized for incidental take, did not provide an estimate of incidental take associated with the action due to limited information regarding the LPC and potential enrollment at the time the programs were approved. However, those programs are specifically tailored to result in benefits to the LPC e.g. New Mexico CCAA for oil and gas and agriculture, Texas CCAA for agriculture, etc., and are therefore unlikely to significantly affect the total estimate below. In addition, the BLM in NM is working on several small programatics to address oil and gas and grazing activities.

Table 1. Estimate of Annual Authorized Incidental Take from all Service-approved actions

Plan	Annual Estimated Incidental Take	Service approval	Issued
Texas CCAA (Ag)	None provided	10(a)1(A) permit; Conference Opinion	November 2, 2006
New Mexico CCAA (oil and gas / Ag)	None provided	10(a)1(A) permit; Conference Opinion	December 5, 2008
WAFWA RWP	600 -700	Letter endorsement	October 23, 2013
NRCS-LPCI	282	Section 7 consultation; Conference Opinion	November 22, 2013
Range-wide oil and gas CCAA	284 - Incorporated in WAFWA RWP estimate and therefore not included in total below	10(a)1(A) permit; Conference Opinion	February 14, 2014
Oklahoma CCAA (Ag)	40 (and 20 nests)	10(a)1(A) permit; Conference Opinion	January 25, 2013; amended March 19, 2014
FSA - CRP	266	Section 7 Biological Opinion	April
Total	**1188 -- 1288**		

Summary of Previous Conservation/Permitting Actions

Cumulatively, based on current population estimates, the total amount of take estimated annually for this and other programs, as represented above in Table 1 constitutes approximately 6.7 – 7.3% of the estimated range-wide population of LPCs (1,188 / 17,615 – 1,288 / 17,615 take to annual population estimate ratios).

Note: The Service recognizes the assumptions inherent in these calculations, and that it likely creates an overestimate of the number of birds adversely affected and birds taken. Also, take encompasses a broad range of effects from temporary impairment of essential behavioral patterns up to and including death. This is important to note, because as the programs are implemented, the expectation is that the improved habitat will increase the success of LPC. Thus, even though we have reviewed that estimate relative to the current condition of the species, in the future as we reach the extent of take estimated above, the status of species across its range should be improving, reducing the overall effect of that take to the species as a whole.

LPCI Conservation Accomplishments To Date

Healthy prairies and grasslands are the common goals of range managers and LPC biologists. Practices available through the LPCI can provide for the establishment and improvement of LPC habitat while also providing long term sustainability for the ranch operation. Since inception in 2010, LPCI has provided a number of positive benefits to LPC habitat. Some of these improvements, such as control of invasive woody species, are immediately visible on the landscape. Other improvements, such as prescribed grazing, are more subtle and may take years to be visible to anyone but the biologists or range conservationists assisting land managers on the ground. Numbers of contracts, dollar amounts, and acres under contract for each state and total for the LPCI is provided in Table 2.

Table 2. Information on LPCI contract numbers, dollars and acres (2010-2013)

COLORADO									
WHIP				EQIP			Totals		
Contract Year	Contracts	Dollars	Acres	Contracts	Dollars	Acres	Total Contracts	Total Dollars	Total Acres
2010	2	$81,065	3,064	4	$284,252	30,751	6	$365,317	33,815
2011	2	$94,705	7,228	3	$328,651	10,335	5	$423,356	17,563
2012	0	$0	0	3	$484,775	33,883	3	$484,775	33,883
2013				1	$222,682	5,822	1	$222,682	5,822
							15	$1,496,130	91,083
KANSAS									
WHIP				EQIP			Totals		
Contract Year	Contracts	Dollars	Acres	Contracts	Dollars	Acres	Total Contracts	Total Dollars	Total Acres
2010	46	$1,271,921	23,544	18	$253,868	4,736	64	$1,525,789	28,280
2011	37	$852,524	12,836	6	$525,548	6,628	43	$1,378,072	19,464
2012	25	$739,831	20,902	11	$638,066	14,757	36	$1,377,897	35,659
2013	37	$1,408,264	36,256				37	$1,408,264	36,256
							180	$5,690,022	119,659
NEW MEXICO									
WHIP				EQIP			Totals		
Contract Year	Contracts	Dollars	Acres	Contracts	Dollars	Acres	Total Contracts	Total Dollars	Total Acres
2010	0	$0	0	2	$234,459	12,571	2	$234,459	12,571
2011	0	$0	0	17	$1,313,162	164,594	17	$1,313,162	164,594
2012	1	$84,814	5,182	8	$1,101,776	78,150	9	$1,186,590	83,332
2013	5	$493,029	22,130	6	$1,104,274	110,125	11	$1,599,998	132,256
							39	$4,334,209	392,753

OKLAHOMA									
WHIP				EQIP			Totals		
Contract Year	Contracts	Dollars	Acres	Contracts	Dollars	Acres	Total Contracts	Total Dollars	Total Acres
2010	2	$95,851	1,441	18	$549,681	17,864	20	$645,532	19,305
2011	0	$0	0	26	$906,460	28,500	26	$906,460	28,500
2012	6	$582,154	9,617	7	$857,530	19,080	13	$1,439,684	28,697
				5	$48,483	12,278	5	$723,382	12,278
							64	$3,715,058	88,780

TEXAS									
WHIP				EQIP			Totals		
Contract Year	Contracts	Dollars	Acres	Contracts	Dollars	Acres	Total Contracts	Total Dollars	Total Acres
2010	88	$2,372,117	70,462	143	$3,191,439	94,890	231	$5,563,556	165,352
2011	58	$2,983,863	85,799	147	$3,884,869	136,978	205	$6,868,732	222,777
2012	4	$152,373	17,174	17	$665,504	31,606	21	$817,877	48,780
				13	$99,081	33,986	13	$456,209	33,986
							470	$13,706,374	470,895

INITIATIVE TOTALS									
WHIP				EQIP			Totals		
Contract Year	Contracts	Dollars	Acres	Contracts	Dollars	Acres	Total Contracts	Total Dollars	Total Acres
2010	138	$3,820,954	98,511	185	$4,513,699	160,812	323	$8,334,653	259,323
2011	97	$3,931,092	105,863	199	$6,958,690	347,035	296	$10,889,782	452,898
2012	36	$1,559,172	52,875	46	$3,747,651	177,476	82	$5,306,823	230,351
2013							67	$4,410,535	220,598
							768	$28,941,793	1,163,170

Table 3 shows the amounts of Brush Management, Prescribed Burning, and Prescribed Grazing implemented and yet to be implemented from the first three years (2010-2012) of LPCI contracts. [Note: No data available for 2013.]

Table 3. Acres of Brush Management, Prescribed Grazing and Prescribed Burning Applied and Planned 2010-2012

Applied Practices 2010 – 2012			
	314 Brush Management	338 Prescribed Burning	528 Prescribed Grazing
Colorado	0	0	0
Kansas	934	2,359	44,500
New Mexico	24,374	0	163,751
Oklahoma	8,070	1,338	44,114
Texas	83,172	4,535	138,810
Total	**110,795**	**8,232**	**375,168**

Remaining Planned Practices 2010 – 2012			
	314 Brush Management	338 Prescribed Burning	528 Prescribed Grazing
Colorado	0	0	101,649
Kansas	1,410	9,336	84,035
New Mexico	29,980	405	210,520
Oklahoma	6,125	4,653	54,865
Texas	40,115	4,225	107,628
Total	**76,132**	**23,859**	**420,992**

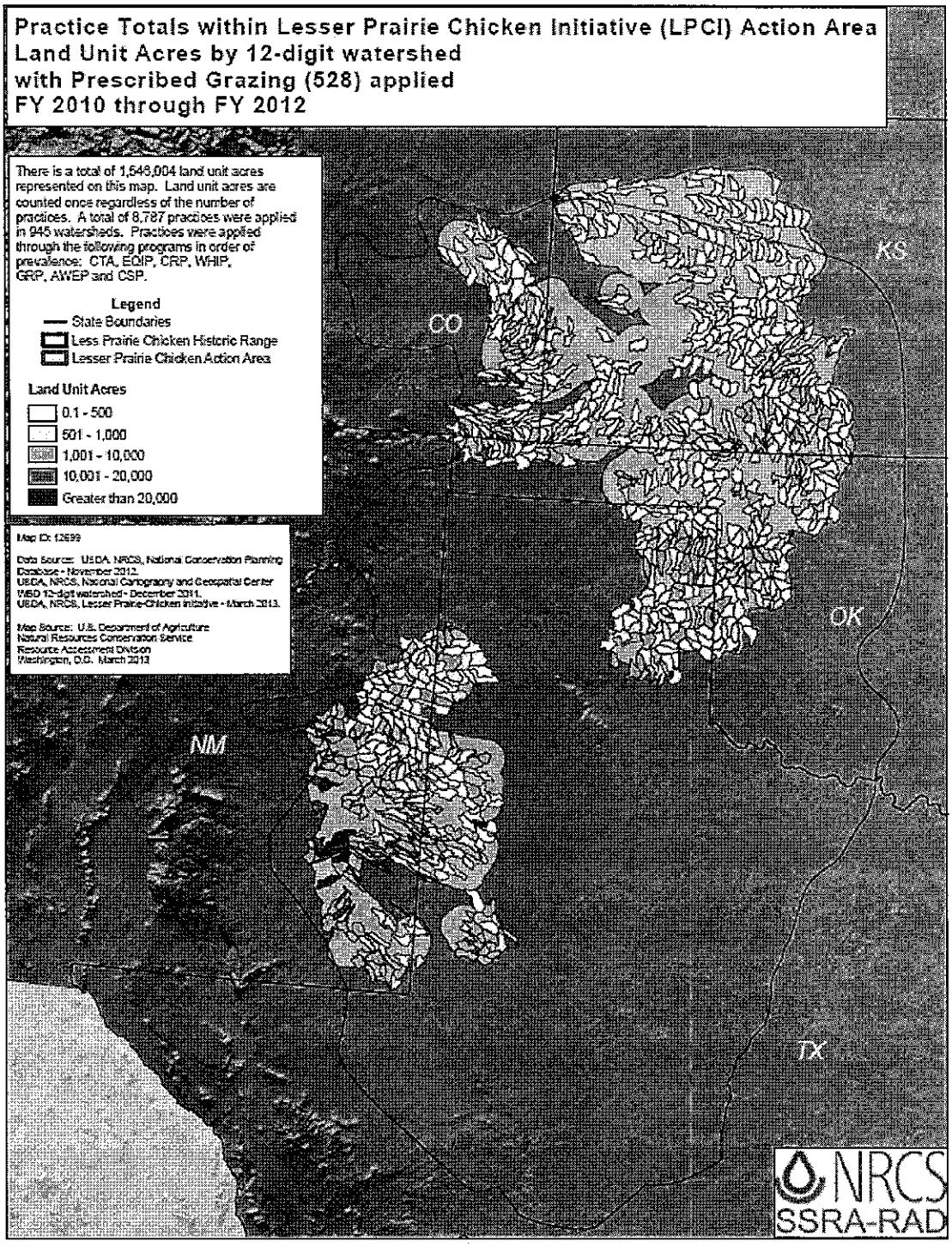
Additionally, NRCS has been providing assistance through the general EQIP and WHIP programs within the Action Area. In fiscal years 2010 and 2011, brush management was applied on 379,258 acres within LPC range with NRCS assistance. In those same two fiscal years NRCS, assisted on over one million acres of Prescribed Grazing on rangeland within LPC range. This represents a large amount of acreage over the LPC range as indicated by Map 2 below.

Other tools incorporated as a result of the LPCI will provide additional benefits to LPC. The Wildlife Habitat Evaluation Guides (WHEGs) developed for use through the LPCI have been adopted by the states and incorporated into their rangewide plan for use by State fish and wildlife agencies when assessing LPC habitat. These tools will provide a baseline on limiting factors and a basis for planning improvements.

Science Support Component

NRCS and Kansas State University have initiated 3 research projects using Conservation Effects Assessment Project (CEAP) funding to examine the effects of LPCI conservation measures on LPC populations, focusing on prescribed grazing, cedar removal, and fence marking. These projects will take at least 3-5 years to complete and begin to understand the impacts of these practices.

NRCS is also using existing Natural Resource Inventory (NRI) data to provide a baseline of rangeland health and vegetation structure across LPC range.



Map 2. Application Prescribed Grazing Conservation Practice (528) in LPCI Action Area 2010-2012

GIS tools are being developed to quantify the extent of the threat of cedar and mesquite invasions into LPC habitats throughout the range. These tools will not only provide a rigorous quantification of the threat, but planning tool support, as well as monitoring change in the landscape overtime.

LPCI contracts are also implementing ranch level monitoring to assess changes in vegetation structure over the duration of the contract and perhaps beyond.

Two WHEGs have been developed for the sand shinnery oak eco-region and the remaining range to the north. The WHEGs provide a field level assessment that determines the limiting factor for LPCs on that particular project area. Once the limiting factor(s) has been identified, those become the focus of progressive planning to address all manageable threats to LPC on the planned acres. The tracking of the WHEG and the Habitat Threats Checklist enables NRCS to account for threat reduction across the LPCI.

LPCI Conservation Outcomes Expected

The overall goal of the Initiative is to increase LPC abundance and distribution through habitat improvements and by addressing local and landscape threats. Upland Wildlife Habitat Management will take place on all acres contracted through the LPCI. This core practice will be supplemented by the Prescribed Grazing core practice where livestock are present. The long-term implementation of these two practices is essential to the success of the LPCI. In addition, supporting practices such as brush control, water developments, fence, and associated practices will provide the tools producers need to properly implement their upland wildlife habitat management plan, and their prescribed grazing management plan where applicable.

In the short-term, the desired outcome is management and enhancement of habitats within the current LPC Action Area. Over the long-term it is anticipated that the LPCI will facilitate the expansion of this range into suitable portions of the historic range as habitat conditions improve and threats are reduced or eliminated. Many other species will benefit from this initiative. The restored native grass will provide habitat for a host of declining grassland birds including but not limited to the lark bunting, Cassin's sparrow, grasshopper sparrow, lark sparrow, western meadowlark, ferruginous hawk, Swainson's hawk, and short–eared owl. In addition, economically important species such as northern bobwhite and scaled quail, pronghorn antelope, and mule deer may benefit from the increased habitat.

Federally Listed, Proposed, and Candidate Species within the Action Area

Many of the practices implemented through the LPCI will have little or no effect on the other listed and candidate species within the Action Area and some practices will benefit these other species. Table 4 lists Federally listed, proposed and candidate species within the Action Area. The species on the list only include those that share habitat with the LPC and where the covered conservation practices may create effects. Table 5 indicates which of the covered conservation practices have the potential to affect these other species.

More complete descriptions of potential threats and conservation measures to these other species are found in Appendix V. A summary of the conservation measures associated with specific practices that may have adverse effects on these species are addressed below. Practices implemented through the LPCI that may adversely affect the species discussed below that cannot be avoided will need an individual or programmatic consultation.

While there are multiple conservation measures associated with the LPCI that landowners can implement to assist in the recovery of these species while carrying out normal daily activities, the most sensitive issues for listed and candidate species within the LPCI Action Area are water-related, followed closely by the potential effects from improper livestock management.

Aquatic and Riparian Species

Temporary soil disturbance and vegetation removal are expected from the implementation of most of the conservation practice standards. These soil disturbance actions have the potential to produce short term sources of sediments entering the water column and persisting for some point downstream of their source. NRCS already has standards and specification for the covered practices that manage ground disturbance actions and situations where a potential source of sediment is created proximate to any riparian/aquatic species. Further, additional conservation measures for the affected species, as outlined below and in Appendix V, are expected to limit sediment effects to the short-term period. Sources of the disturbance would include use of equipment (post-hole diggers, tractors, and other machinery) as well as practices that involve the planting or manipulation of vegetation associated with the restoration practice standards. The use of the conservation measures are expected to minimize the short-term adverse effects of practice installation. Existing NRCS specifications have been developed to manage the risk of soil erosion, and require the creation of a restoration strategy using native plants appropriate to the ecological site will be used to provide a temporary buffer in the establishment of native vegetation will further ameliorate these potential adverse effects.

To avoid negative effects to aquatic, riparian, and species dependent upon aquifer-fed spring systems, avoid any LPCI practice that removes ground water or causes drying of surface water in the occupied habitat of the Arkansas darter, Arkansas River shiner, Foster's spring snail, Noels' amphipod, Pecos assinine, Pecos gambusia, Roswell springsnail, Pecos sunflower, or Wright's marsh thistle.

Although unlikely to be directly affected, Rio Grande silvery minnow, Pecos bluntnose shiner, and Texas hornshell, which occupy continuous-flowing river reaches, and southwestern willow flycatcher, which occupies dense riparian habitats, could be indirectly affected by water related LPCI practices such as well development. To avoid impacts to these species, ensure that water withdrawals will not reduce quality of aquatic or riparian habitat. Avoid any LPCI practice that removes ground water or causes drying of surface water in the immediate area occupied by these species.

Conservation measures for Arkansas River shiners include protection and enhancement of riparian and stream habitat with riparian buffers, exclusion of livestock from streams, and control

of salt cedar and other non-native vegetation. Avoid any practice that removes ground water or causes drying of surface water occupied by the species.

To provide conservation for Koster's springsnail, Noels' amphipod, Pecos assiminea, and Roswell springsnail, an additional buffer surrounding occupied habitat is needed to protect water quality and improve land management practices. Other measures include avoiding any practice that removes ground water or causes drying of surface water in the immediate area occupied by the species; restricting access to occupied habitat; and avoiding the use of prescribed burning to control invasive vegetation. For the Texas hornshell an additional conservation measure would be to restrict access to Texas hornshell beds.

Mammals

Black-footed ferrets do not currently overlap with the current estimated occupied range of the LPC, except in Logan County, Kansas and possibly northeast New Mexico. Black-footed ferret recovery partners are working to develop measures that would facilitate private land black-footed ferret reintroductions. Habitat management, brush management, and good grazing practices may have beneficial effects to the black-footed ferret.

Birds

Interior least tern breeding and nesting sites within the range of the LPC are limited to the Red and Canadian Rivers and their major tributaries. Potential effects to interior least terns from ground disturbing practices (e.g., fencing, pipelines, and grade stabilization) in the bed and banks of these areas could be avoided by not conducting these practices in known nesting streams, and/or seasonal avoidance of interior least tern breeding or nesting habitat.

Of greatest importance to conservation efforts for the Northern Aplomado falcon is protection and restoration of pesticide- and lead-free grassland and wetland communities and associated forest, woodland, and thorn scrub. Human intrusions can cause nest abandonment and make Aplomado falcons more susceptible to detection and harm from potential predators. Restrict access to known or suspected nesting areas. Avoid any practice that removes ground water or causes drying of surface water in the immediate area occupied by the species.

Piping plovers require relatively barren, unvegetated salt flats, river sandbars and islands for nesting and foraging. A combination of watershed, riparian and stream restoration may provide the best means for improving stream habitat and watershed integrity as a whole. Land use practices that may adversely affect stream flows, channel morphology, and sediment transport should be avoided. Conservation measures include protection and enhancement of riparian and stream habitat with riparian buffers, protection from human disturbance (off-road vehicle use, etc.) exclusion of livestock from streams, control of salt cedar and other non-native vegetation to help restore historic levels of base flows and to reduce perch sites and habitat for potential predators.

Because the southwestern willow flycatcher breeds only in dense, mesic riparian, conservation measures may include: remove cattle from the riparian areas to enhance riparian habitat and prevent destruction of nests (although some light to moderate grazing during the winter in riparian areas is acceptable); restrict human access, including controlling off-road vehicles, to

habitat during the breeding season; pole-plant willows where soils and hydrology are suitable for flycatchers; and construction of artificial oxbows as a means to stabilize eroded banks.

To conserve whooping cranes, limit activity within 0.5-miles of wetlands suitable as stopover sites during spring and fall migration periods. Autumn migration normally begins in mid-September, with most birds arriving on the Texas wintering grounds between late October and mid-November. Spring migration departure dates are normally between March 25 and April 15, with the last birds usually leaving by May 1. To determine what suitable whooping crane habitat is, look for shallow wetlands in open, non-wooded areas free from human disturbance, such as nearby roads or buildings with at least some water area less than 18 inches deep. This will include marshes, small ponds, lake edges, or rivers. Avoid any practice that removes ground water or causes drying of surface water in the immediate area of possible stopover sites and that increases the risks posed by new structures on the landscape. Other LPCI practices that may be beneficial to the whooping crane include watering facilities to provide livestock with reliable water resources outside of stopover sites, planting, and pond development.

Plants

Protection of habitat and individual Kuntzler hedgehog cactus plants, especially on private lands is of the highest priority for the recovery of this species. Grazing control may help to prevent erosion.

The single most important conservation measure for gypsum wild buckwheat is access control to prevent damage to individual plants.

Conservation measures for the Pecos sunflower include managing groundwater use in the surrounding area to assure adequate spring flows, but water could be exported after it has passed through Pecos sunflower habitat. Livestock grazing can damage Pecos sunflower plants, however, removal of competing grass cover and soil disturbance by livestock may help the germination and establishment of sunflower seeds. The effects of grazing season, frequency, intensity and duration need further study to develop recommendations for best management practices.

To conserve Wright's marsh thistle, grazing exclosures could be built in riparian areas to support protection and expansion of extant populations. Avoid any practice that removes ground water or causes drying of surface water in the immediate area occupied by the species.

Other At-Risk Species Within the Action Area

The dunes sagebrush lizard (DSL) is no longer a candidate for listing under the ESA, in large part due to the conservation actions that are being undertaken by landowners enrolled in two voluntary agreements, the Candidate Conservation Agreement for the Lesser Prairie Chicken and the Dunes Sagebrush Lizard in New Mexico signed in 2008, and the Texas Conservation Plan (TCP) for the Texas Dunes Sagebrush Lizard signed in June 2011. The DSL has a two state range and is currently restricted to five counties (Andrews, Crane, Gaines, Ward and Winkler) in western Texas and four counties (Chaves, Eddy, Lea and Roosevelt) in eastern New Mexico. Awareness of landowners who have voluntarily enrolled in these two CCAAs is essential to

make sure that the implementation of the conservation measures to benefit the LPC as a part of the LPCI do not impact the DSL and its particular shinnery oak prairie habitat.

The TCP area includes those portions of the following Texas counties which have suitable habitat for the DSL: Andrews, Cochran, Crane, Ector, Gaines, Ward, Winkler, and Yoakum. An additional six counties, including Bailey, Hale, Hockley, Lamb, Upton, and Terry contain shinnery sands ecoregion, which is not currently considered DSL Habitat, but is included in the Plan Area for further research and recovery activities. While DSLs have not been documented in all of these counties, the broader Plan Area is intended to allow flexibility for participants to undertake research and recovery activities in areas where appropriate.

The following recommendations were in the 2011 LPCI Conference Report and developed while the DSL was a candidate species and should be followed on properties where DSL habitat exists and where properties are enrolled in State CCAAs.

Conservation measures for the DSL include, but may not be limited to: allowing no surface occupancy within 200 meters of areas designated as occupied or suitable, unoccupied dune complexes or within delineated shinnery oak corridors. Areas should be determined at a landscape scale (dune complexes) rather than a dune-by-dune scale and should also delineate corridors for movement between occupied and suitable dune complexes; prohibiting tebuthiuron spraying within 500 m of suitable and occupied habitat (dune complexes) or within corridors that connect dune complexes that are within 2,000 m of each other; and removing brush (**not** shinnery oak) that invades into the habitat preferred by DSLs. If dunes or dune complexes cannot be avoided, approved practices necessitating physical presence within dunes or dune complexes will avoid the critical period of March 1 to October 30 to avoid adverse effects to DSLs Avoid brush control treatments to large blocks or strips and no more than 50 percent of an individual management unit (pasture) will be treated during any two year period. Establish a grazing plan that ensures: stocking rates are in balance with the forage supply; season of use is rotated through pastures to ensure plants have adequate reproduction opportunity; and that the plan is implemented to increase residual cover of perennial grasses and forbs.

Table 4. Federally Listed, Candidate, and Proposed Species within the LPCI Action Area

Common Name	Scientific Name	Federal Status[a]	Critical Habitat
Arkansas darter	*Etheostoma cragini*	C	N/A
Arkansas River shiner	*Notropis girardi*	T	Yes
Black-footed ferret	*Mustela nigripes*	E/EXPN	No
Dune sagebrush lizard	*Sceloporus arenicolus*	NL	No
Gypsum wild buckwheat	*Eriogonum gypsophilum*	T	Yes
Interior least tern	*Sterna antillarum athalassos*	E	No
Koster's springsnail	*Juturnia kosteri*	E	Yes
Kuenzler's hedgehog cactus	*Echinocereus fendleri var. kuenzleri*	E	No
Noel's amphipod	*Gammarus desperatus*	E	Yes
Northern Aplomado falcon	*Falco femoralis septentrionalis*	E	No
Pecos assiminea	*Assiminea pecos*	E	Yes
Pecos bluntnose shiner	*Notropis simus pecosensis*	T	Yes
Pecos gambusia	*Gambusia nobilis*	E	Yes
Pecos sunflower	*Helianthus paradoxus*	T	Yes
Piping plover	*Charadrius melodus*	E, T	Yes
Rio Grande silvery minnow	*Hybognathus amarus*	E, EXPN	Yes
Roswell springsnail	*Pyrgulopsis roswellensis*	E	Yes
Southwestern willow flycatcher	*Empidonax traillii extimus*	E	Yes
Texas hornshell	*Popenaias popeii*	C	N/A
Whooping crane	*Grus Americana*	E	Yes
Wright's marsh thistle	*Cirsium wrightii*	C	N/A

[a] E – Endangered species; T - Threatened species; PE - Proposed endangered species; C – Candidate species; NL – Not listed, but considered at-risk

Table 5. Potential response of Species to Conservation Practices

Common Name	645 Upland Wildlife Management	528 Prescribed Grazing	643 Restoration & Mgmt of Rare & Declining Habitats	472 Access Control	511 Forage Harvest Management	338 Prescribed Burning	314 Brush Management	394 Firebreak	340 Cover Crop	342 Critical Area Planting	512 Forage & Biomass Planting	550 Range Planting	614 Watering Facility	574 Spring Development	533 Pumping Plant	642 Water Well	516 Pipeline	410 Grade Stabilization Structure	382 Fence	500 Obstruction Removal	315 Herbaceous Weed Control	378 Pond
Arkansas Darter														X		X					X	
Arkansas River shiner																X					X	
Black-footed ferret	+	+	+	+			+		X	X	X	X										
Dune sagebrush lizard							X														X	
Gypsum Wild Buckwheat		X		+																		
Interior Least Tern		X		+			+															
Koster's Springsnail						X								X								
Kuenzler's Hedgehog Cactus		X																				
Noel's Amphipod						X								X								
Northern Aplomado Falcon																						
Pecos Assiminea														X							X	
Pecos Bluntnose Shiner																X					X	
Pecos Gambusia				+										X								
Pecos Sunflower		±																				
Piping Plover				+																		
Rio Grande Silvery Minnow																X						
Roswell Springsnail														X							X	
Southwestern Willow Flycatcher		X												X								
Texas Hornshell																X					X	
Whooping Crane									+		+		+			X						+
Wright's Marsh Thistle		X												X								

+ = positive response anticipated from application of the conservation practice standard
X = negative response anticipated from application of the conservation practice standard
± = depending on the timing of application, response may be positive or negative
If no symbol, application of the conservation standard is not likely to have an effect

EFFECTS OF THE ACTION

We have evaluated the identified conservation practice standards in the context of how the individual standards have the potential to produce beneficial and adverse effects to the LPC – at the individual, population, and landscape scales. The Service worked in collaboration with the NRCS to develop specific conservation measures for the 27 conservation practice standards reviewed. The Service believes that, as implemented, the conservation measures will result in ameliorating, minimizing, or eliminating potential adverse effects. However, even with the implementation of the conservation measures, some remaining adverse effects will occur to the LPC. Nevertheless, the Service believes that the conservation measures, in concert with the goals and objectives of the LPCI, will result in an overall benefit to the LPC.

Each conservation practice standard will be designed to work synergistically with other conservation practice standards under a conservation management system to achieve the purposes of the Upland Wildlife Habitat Management practice (645), which serves as the core management practice for landowners wanting to participate in the LPCI. This linkage between conservation practice standards produces benefits and minimizes adverse effects to the species. In some cases, application of several conservation practice standards at the local or landscape scale will produce benefits while simultaneously creating a potential temporary source of risk to individual birds. For example, removal of encroaching eastern red cedar is likely to result in a positive population response by LPC over the long-term, despite the potential for some level of temporary disturbance to the bird from the methods used.

Appendix IV provides a comprehensive narrative of each conservation practice standard covered in the Opinion, its purpose, the identification of any potential adverse effects and description of expected beneficial effects, and the identification of the appropriate conservation measure(s).

Adverse Effect: (I) Physical disturbance (including noise)

All of the covered conservation practice standards, either directly or indirectly have the potential to produce some additional level of physical disturbance because they involve the physical presence of humans, livestock, and/or associated equipment, vehicles or machinery. Further, future periodic disturbances have the potential to occur as maintenance actions for the implemented practices may be needed over their operational life. Although effects are not quantitatively known, the literature suggests that some form of physical effects from presence and/or associated noise will create a disturbance response to individual birds. Most of this disturbance, however, will be localized to the immediate area where the work is occurring and is expected to be of limited duration and temporary in nature.

Of significant concern is physical disturbance during the LPC breeding and nesting season (varies by state). The bird's response ("flushing"/escape behavior) may place individual birds at greater risk to predation when they leave cover. If the equipment and actions occur close to occupied nests, the female may abandon the nest for some indeterminate period or permanently. The net effect of the physical disturbance including sustained sources of noise may be a localized reduction of survival or productivity, avoidance of otherwise suitable habitat, and/or reduction of breeding frequency. The adverse effect of noise is amplified if it is of significant volume or

duration during the mating displays of males on leks. If noise interferes with mating displays, and thereby female attendance, younger males may not be drawn to the lek and eventually leks could become inactive (Hunt 2004).

The presence of livestock may also create physical disturbance to LPC. Adverse consequences of grazing include livestock trampling of LPC nests. Although the effect of trampling at a population level is unknown, outright nest destruction has been documented. For example, Pitman et al. (2006) quantified nest loss over 6 breeding seasons and identified 1.9% of nest loss (n = 161) to trampling by livestock. The presence of livestock potentially could cause LPC to abandon their nests, but has not been documented.

Disturbance of some individual LPC may occasionally occur from feeding, calving, and herding of livestock. These effects are expected to rarely occur and are not expected to produce significant changes in species distribution and abundance. However, some small level of mortality is expected.

With respect to noise or physical disturbance, normal and routine use of equipment necessary to maintain ranching operations is not considered by the Service to be significant source of adverse effect to the species. We base this conclusion on the fact that the effects of commercial energy development create continuous and large areal effects on the landscape and the types of equipment and machinery are markedly different than equipment used implementing the covered conservation practice standards. However, there is the potential for vehicle collisions from a variety of sources (discussed below) and that sources of noise in excess of 40 A-weighted decibels (dBA) may be created during practice implementation.

Empirical data regarding the impacts of disturbance associated with certain types of energy development on prairie grouse populations (Hagen 2010) suggest that direct impacts of project related activities (e.g., roads, transmission lines, pipelines, turbines, etc.) and disturbances associated with operation and maintenance activity are likely to be similar to those from energy developments throughout the Intermountain West (Becker et al. 2009, Hagen 2010). The ecological extent of the impacts of these activities has not been quantified. However, there is recent science that demonstrates the effects of noise on greater sage-grouse breeding behavior (Hunt 2004, Crompton and Mitchell 2005, Holloran 2005, Blickley and Patricelli 2012). Sound levels >40 dBA reduces breeding activity and increases stress levels (as measured by hormone levels) in sage-grouse (Blickley and Patricelli 2012) and decrease in LPC lek activity (Hunt 2004). Given similarities in life history strategies (especially breeding behavior and spatial relationships of leks and nests) between sage-grouse and prairie-chickens, it is reasonable to implement a similar mitigative measure in the context of noise pollution at this threshold.

Two conservation measures were specifically developed to minimize physical disturbances to LPC during the critical breeding and nesting season. The first conservation measure establishes a non-disturbance period and distance from known leks. The second relevant conservation measure facilitates the creation of site-specific criteria as needed when the specific local and landscape conditions for a particular site require a local conservation strategy. State Fish and Wildlife Agencies, NRCS state technical committee recommendations, the Service's Partners for

Fish and Wildlife biologists, and other local experts will assist NRCS in establishing a local solution where needed.

The adverse effects of this concern are expected to be localized and temporary, and the use of the conservation measures will further reduce the risks of adverse effects at the scale upon which populations or the species will be negatively impacted. On balance, the anticipated benefits of installation and application of a particular conservation practice standard under the LPCI are expected to exceed the temporary adverse effects created from their installation.

Adverse Effect: (II) Temporary soil disturbance and vegetation removal and (III) Increased potential of introduction of invasive plants

Temporary soil disturbance and vegetation removal are expected from the implementation of most of the conservation practice standards. This disturbance may result in loss of cover and increase the potential for invasive plants, especially woody plants like eastern red cedar and mesquite. For purposes of this analysis, the Service is combining these two conservation issues into a single discussion of their potential adverse effects. Sources of the disturbance would include use of equipment (post-hole diggers, tractors, and other machinery) as well as practices that involve the planting or manipulation of vegetation (examples such as brush management, shrub control, and prescribed burning). Common potential adverse effects include degradation of habitat conditions and the potential for increased habitat fragmentation if the scale of the disturbance is large enough and the potential to create opportunities for colonization of these disturbed sites by invasive plants.

Temporary adverse effects on individuals can include increased levels of stress hormones, increased recesses during incubation (i.e., may increase detection by predators and predation risk), or disturbance/flushing of young broods. The latter may increase predator detection and predation risk as chicks increase the frequency of calling in attempt to rejoin with their brood and hen. If these risks are realized, individual fitness is reduced and may have population level effects if disturbance is over a broad enough spatial or temporal scale.

Collectively, these adverse effects can produce impacts to individual birds as well as at the population level. The primary adverse effect is the potential for habitat degradation from unsustainable or unmanaged livestock grazing – specific to temporary loss of nesting and brood-rearing habitat. A secondary adverse effect is the opportunity created for invasion of undesirable plants during practice implementation.

The conservation practice standards analyzed by the Service that could produce these potential sources of adverse effect (temporary soil disturbance and vegetation removal and increased potential of introduction of invasive plants) will be implemented by NRCS to conduct habitat management, restoration and enhancement actions which under the LPCI are designed specifically to meet the conservation needs of the LPC. If implemented outside of the LPCI, the focus will not be on directly benefiting the LPC (but as stated before, implementation outside of the LPCI in LPC habitat will use the conservation measures described in the Opinion and will not create a source of additional adverse effect). The net effect will be that practice installation and maintenance may result in short-term disturbance but produce long-term restoration,

maintenance and enhancement gains for the LPC. If the conservation practices are implemented outside of the LPCI, the net effect for the LPC will also be positive or at least neutral because the expected long-term gain may not be realized as the practice will be implemented to support objectives other than explicit LPC conservation.

That said, the use of the conservation measures are expected to minimize the short-term adverse effects of practice installation. Conservation measures have been developed to manage the risk of soil erosion as well as the risk of invasive plants. These measures manage the risk during practice installation and require monitoring and subsequent redress of any created or emerging threat throughout the effective life of the conservation practice standard. A restoration strategy using native plants appropriate to the ecological site will be used to provide a temporary buffer in the establishment of native vegetation will further ameliorate these potential adverse effects.

The management practice Prescribed Grazing also deserves a special note here, as livestock management has the potential to create conditions for temporary soil disturbance and vegetation removal and increased potential of introduction of invasive plants. The conservation measure to address potential adverse effects from grazing ensures that a prescribed grazing system is designed and implemented in accordance with the identified conservation measures and recommendations from the affected State Fish and Wildlife Agency. The measures relating to timing, frequency, intensity and duration, and the targeting of stocking rates which produce a desired vegetative response that, upon implementation, will insure that a diversity of plants and cover types, including shrubs, remain on the landscape. Further, the outcome of a prescribed grazing plan will ensure livestock utilization levels leave sufficient cover in the spring to ensure that LPC nests are adequately concealed from predators, while also providing appropriate brood rearing habitat. Although some level of adverse effect is anticipated from livestock operations in the short-term, the long-term benefits will manifest as species habitat will be maintained or improved following application and the expected species response will be positive. Grazing systems will be designed such that the most limiting factor identified on the WHEG (nesting or brood rearing habitat) will be obtained through implementation of the grazing management plan.

As a result, the Service expects that the emphasis by NRCS on designing each landowner's conservation plan under the principles of RMS planning will create habitat conditions which will support all life history requirements of the LPC at the landscape scale. It is recognized that dependent upon the grazing design, patch grazing will occur. Patch grazing will result in areas within individual units where the goal is to obtain nesting habitat and some areas for brood rearing which may lead to areas that provide for only one life history stage but combined across the landscape provide for the entire life history needs. The 528 grazing management and 645 plan allows for these areas which will create a mosaic across smaller management units of necessary LPC habitat. As a result of the expected application of these grazing systems, the Service concludes that any potential effects from temporary habitat manipulations resulting from grazing will not rise to the level of requiring incidental take coverage. Further, the Service believes that the long-term and landscape benefits of installation and application of the particular Conservation Practice Standards as conditioned by the conservation measures are expected to exceed any temporary adverse effects created from their installation.

Adverse Effect: (IV) Permanent Removal/loss of suitable habitat

This adverse effect is a result of permanent removal of habitat conditions and specific vegetative loss caused by the installation of the conservation practice standard or the expectation that, once implemented, permanent degradation of habitat conditions for the LPC will have resulted. Certain facilitating practices (firebreak, watering facility, spring development, pumping plant, water well, pipeline, grade stabilization structure, fence, and pond) covered in this Opinion have the potential to result in the permanent removal/loss of habitat for the LPC.

The primary adverse effect is the permanent loss of forage and nest habitat which can lead to a reduction of available habitat and subsequent decline in LPC populations. The Service believes that maintaining large areas of suitable habitat with appropriate connectivity is essential to LPC persistence (Giesen 1998, Bidwell *et al.* 2002, Hagen *et al.* 2004).

NRCS is not proposing to assist private landowners in converting LPC habitats to other uses, such as row-crops or "sod-busting". Habitat conversion is one of the mechanisms identified in the listing proposal (77 FR 73828) as contributing to LPC habitat loss and alteration, but is not relevant to this analysis as it is not a covered action for this Opinion. Consequently, any permanent loss of habitat and increases in rate/extent of habitat fragmentation under the conservation practices implemented as described in the proposed action is expected to be localized and minor.

Temporary adverse effects on individuals can include increased levels of stress hormones, increased recesses during incubation (i.e., may increase detection by predators and predation risk), or disturbance/flushing of young broods. The latter may increase predator detection and predation risk as chicks increase the frequency of calling in attempt to rejoin with their brood and hen. If these risks are realized, individual fitness is reduced and may have population level effects if disturbance is over a broad enough spatial or temporal scale.

Most of the structural practices will produce localized losses which can be minimized using the identified recommended conservation measure(s). The conservation measure(s) focus on design and planning aspects of the practice so as to avoid large expanses of habitat loss especially from linear practices (e.g., fence lines, water pipelines, etc.).

The conservation practice Prescribed Grazing also deserves a special note here, as livestock management has the potential to create conditions that are unsuitable to LPC persistence. The conservation measures for Prescribed Grazing include managing elements of livestock relating to timing, frequency, intensity and duration, and stocking rates. By addressing each of these elements, each prescribed grazing plan will result in a desired vegetative response that will insure that a diversity of plants and cover types, including shrubs, remain on the landscape and that livestock utilization levels leave sufficient cover in the spring to ensure that LPC nests are adequately concealed from predators, while also providing appropriate brood rearing habitat. With the assistance from the State Fish and Wildlife Agency personnel and others, the landscape level benefits can also be identified and produced. As a result of the expected application of these grazing systems, the Service concludes that any potential adverse effects from grazing

pursuant to the practices and conservation measures prescribed in this Opinion will not rise to the level of requiring incidental take coverage.

The long-term and cumulative benefits of installation and application of the particular Conservation Practice Standards as conditioned by the conservation measures are expected to exceed the temporary expected adverse effects created from their installation. Further, the use of the conservation measures will ensure that the species habitat is maintained or improved following application. Cumulatively, the expected species response is anticipated to be positive as the extent of adverse effects are not expected to occur at the scale necessary to adversely impact population trends or to result in significant additional habitat fragmentation effects.

Adverse Effect: (V) Increased potential of accidental mortality to individuals

Several conservation practice standards (e.g., Watering Facility, Forage Harvest Management, Cover Crop, and Conservation Crop Rotation, Fencing) may result in mortality or injury to individual birds. These include accidental mortality from drowning in livestock water tanks, striking a fence, or vehicle collision. Any mechanized equipment operating at intensive levels in LPC habitat has the potential to create harm to individual birds as a result of accidental collisions with birds.

The use of specific conservation measures focusing on design, timing, and method of operation of machinery and the placement and management of water features (such as the use of escape ramps and individual site selection for proper placement) to reduce mortality risk is expected to significantly reduce the potential adverse effects of these conservation practice standards.

The remaining source of adverse effects, the construction and placement of fences, however, remains as a primary concern to the Service. The effects of fencing on LPC include direct mortality through collisions, creation of raptor and corvid perch sites, and the potential creation of predator corridors along fences (particularly if a road is maintained next to the fence). From 1999 to 2004, researchers from the Sutton Center recovered 322 carcasses of radio marked LPC in New Mexico, Oklahoma, and portions of the Texas panhandle. For LPC in which the cause of death could be determined, 42 percent of mortality in Oklahoma was attributable to collisions with fences, power lines, or automobiles. In New Mexico, only 14 percent of mortality could be traced to collision. The difference in rate of observed collision between states is attributable to differences in the amount of fencing on the landscape resulting from differential land settlement patterns in the two states (Patten *et al.* 2005). With between 14 and 42 percent of adult LPC mortality currently attributable to collision with human-induced structures, Wolfe *et al.* (2007) assert that fence collisions will negatively influence long-term population viability for LPC. However, the use of setbacks, buffers, and fence marking is expected to manage or reduce the risk of collisions (Wolfe *et al.* 2009).

The long-term population-level effects of loss of birds due to fence strikes are unknown. This uncertainty can only be addressed through development of a long-term research and monitoring program for the LPCI and related conservation efforts in the range of the species.

The proposed action will include the principle technique for minimizing the adverse effects of fencing to ensure that planning and design placement of new fences provides at least a 1/2 mile buffer from occupied and recently occupied leks (lek attendance within last 5 years). If this is not possible, a requirement to mark the fence to increase visibility will be implemented by NRCS. NRCS will identify existing fences that are within 1/2 mile of an occupied or recently occupied lek and consider removing or relocating the fence to a site further from the lek. NRCS will require marking all existing fences within 1/4 mile from an occupied or recently occupied lek, or in areas where collisions are known to occur. Larger buffers for marking or placement of fence may be necessary but should be conducted with advice from the State Wildlife Agency.

Use of visible marking and strategic placement of fences have been shown to reduce sage-grouse mortalities by as much as 70% as compared to unmarked sections (Stevens 2011). The science support element (through monitoring and assessment) of the LPCI will provide important information on the overall effectiveness of marking fences and the long-term response of the species.

Fence strikes are a potential source of mortality that can be influenced by location, design, density of fences, and other site specific factors. Cumulatively, the use of the recommended conservation measures is anticipated to provide a net positive conservation outcome to the species, created through removal of existing fences in essential habitat features such as leks, the installation of escape ramps, and modifications of the installations of the other affected conservation practice standards.

Adverse Effect: (VI) Increased potential for predation

NRCS will implement conservation measures to address the potential for predation to the species as direct or indirect consequence of implementation of the proposed action.

Certain conservation practice standards may increase the potential for predation on individual birds through the installation of structures or modifying existing habitat conditions. For example, some installed practices may create habitat for raptor perching. In addition, some practices will temporarily reduce available cover and food sources, making LPCs more vulnerable to predation. Finally, the presence of humans during practice installation can temporarily create an artificial food source for predators (i.e., trash attracts predators such as foxes, coyotes, badgers). The affected conservation practice standards include those that involve the creation or maintenance of infrastructure or habitat manipulations associated with ranching operations.

The identified conservation measure suggests modifications to the design of fences, management of brush piles, and avoiding the use of tall structures in the species' habitat to the extent possible and practicable. Removing raptor perches such as trees, power poles, and fence posts is likely to lower predation risk more than any conventional predator removal methods (Wolfe *et al.* 2007). Conservation measures are anticipated to effectively reduce the risk of predation at the local and landscape scale to the extent that adverse effects, if any occur, would not to the level of requiring incidental take coverage.

CUMULATIVE EFFECTS

Cumulative effects include the impacts of future State, local, or private actions that are reasonably certain to occur in the Action Area. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the ESA. Some future potential actions were briefly described above in Conservation Actions Not Yet Implemented.

Because most of the land (approximately 95 percent) in the occupied range of the LPC is in private ownership, future land use decisions by farmers and ranchers will have the greatest impact on LPC habitat. These private actions will be influenced by economic and climactic factors, including drought, fluctuating crop commodity prices, and oil, gas and wind energy development.

As described in this Opinion and the FSA Opinion, farming and ranching practices can be compatible with LPC conservation efforts and produce beneficial effects to the species. However, the conversion of native prairie, rangeland or other non-CRP grassland habitat to cropland or development uses will have adverse cumulative effects on LPC. The 2014 Farm Bill includes a provision that is expected to reduce the economic incentive for conversion by linking conservation compliance to crop insurance subsidies.

Some areas of the Southern Great Plains have significant oil and natural gas deposits, which when developed have been reported to cause impacts to LPC. Concern continues that increased densities of wells in the area will result in further reduced LPC populations. Hunt (2004) found a higher number of abandoned leks near active well sites. Roads, power lines, pipelines, compressor stations, and other structures all add to the adverse cumulative effects of oil and gas development on LPC populations. However, there are several conservation planning efforts mentioned in the environmental baseline section of this Opinion that include measures aimed at reducing impacts of oil and gas development described above.

Known for its steady, and sometimes intense, winds, the Southern Great Plains are currently experiencing significant wind energy and associated infrastructure development. Wind developments include turbines to harness the energy, access roads, and transmission lines. Physical disturbance during construction and operation of wind turbines have the potential to disturb nesting LPC. Behavioral avoidance of such areas by LPC has the potential to further exacerbate habitat fragmentation concerns. Robel et al (2004) predicted that nesting and brood-rearing LPC hens will avoid wind turbines by at least a one mile radius. However, there are several conservation planning efforts mentioned in the environmental baseline that include measures aimed at reducing impacts of wind energy development described above.

SUMMARY OF EFFECTS

Implementation of the proposed action under the LPCI is intended to ameliorate threats to the LPC and to improve its conservation status. The targeted benefit of LPCI is to create strategic improvements to the status of the species on private ranching operations receiving NRCS cost

share and technical assistance. The proposed action in conjunction with the integrated use of the conservation measures is expected to benefit the LPC by maintaining, enhancing, and restoring populations and their habitats as well as by reducing the threats of direct mortality. Landowners who are interested in participating in the LPCI must agree to contribute to the maintenance of LPC habitat on their enrolled lands, follow the recommended standards and specifications within the core Upland Wildlife Habitat Management Practice and each of the conservation practice standards used. The LPCI will result in restoration of habitat by either implementing grazing practices and land management measures to allow the natural reestablishment of suitable habitat conditions to occur (passive restoration) or by seeding/planting (active restoration) during the term of the individual contracts (between 2 and 10 years). The strategic nature of the LPCI will also focus financial and technical assistance to priority areas (e.g., as defined by lek counts). The strategic approach will also enhance the landscape level benefits of the proposed action. Implementation of the conservation measures whenever land is determined to be LPC habitat, whether or not the land is enrolled in-the LPCI (i.e., receiving LPCI funds) are expected to avoid creating new adverse effects and otherwise maintain the conservation status of the species.

Conservation Measures are designed to maintain and enhance habitat and decrease fragmentation which is the greatest threat to LPC. Conservation Measures also include commitments to reduce direct mortality and conserve the natural landscape attributes required by the species. The LPCI will encourage that large expanses of connected private ranchlands will be involved in habitat creation, restoration and/or management to provide a substantial conservation benefit for the species. Because the species' persistence is dependent almost exclusively upon private lands, the targeted nature of the LPCI is expected to magnify these conservation benefits.

It is important to note that LPC co-evolved with large herds of bison that continuously removed vegetation over vast portions of the southern Great Plains. The grasses upon which LPC depend have co-evolved and thrive with some level of grazing (Mack and Thompson 1982). While domestic livestock grazing occurs at different temporal and spatial scales than that of historic bison herds, herbaceous removal as designed through NRCS 528 will assist in emulating similar disturbance regimes.

Over the individual and cumulative application of the LPCI as designed (including the incorporation of the conservation measures), the Service believes that the extent and occurrences of adverse effects will be minimized and off-set by the creation of a sustained grazing management system (at both the field, farm, and landscape levels) specificially compatible with and supporting the life history and requirements of the LPC and the other covered species while maintaining a healthy grasslands ecosystem.

We expect that the majority of incidental take will be in the form of death, injury, or temporary harassment (via displacement) during conservation practice installation, operation, and maintenance. For some conservation practice standards, such as fences, some level of incidental take is expected over the life of the practice. The scale of the effect will be landscape specific, but will most likely involve mortality of adult birds, the destruction of nests, and loss of eggs.

The overwhelming conservation benefits of implementation of the proposed action within the selected priority areas, maintenance of existing habitat, and enhancement of marginal habitat will

outweigh short-term negative impacts to individual LPC. Beyond lands covered by/enrolled in the LPCI, this beneficial effect will be less noticeable in a comparative sense but nonetheless expected. The implementation of the proposed action will result in more of the threats that adversely affect populations being managed, more habitat under the appropriate management prescriptions, and more information being developed and disseminated on the compatibility of sustainable ranching operations on the persistence of this species across the landscape.

The LPC rely upon landscapes rather than a single specific habitat to persist and the proposed action is an organized and strategic effort to support this level of focused conservation. That landscape objective can only be achieved by the cumulative results of individual actions occurring at the local and population level. A primary aspect of managing the species is the awareness and use of state-level partners, such as the State Fish and Wildlife Agency, NRCS State Technical Committee, and other recognized experts to ensure that the benefits to the species occur at the scale(s) necessary, as the LPCI matures and more landowners become engaged in LPC conservation in the context of managing private ranchland in the Action Area.

Land management in the range of the LPC has been heavily influenced by natural and economic forces. The arid ecosystem where the LPC lives is characterized by climatic extremes - from droughts to flash floods and extreme heat to bitter cold. Economic factors including fluctuating crop commodity prices and wind energy leases continue to impact landowners. While future conditions cannot be predicted, it is safe to assume that climatic and economic extremes may impact the ability to conserve and manage LPC populations.

The Service finds that effective implementation of conservation practice standards and associated conservation measures are anticipated to result in a positive population response by the species. This positive response is expected as threats are reduced; notably in addressing habitat fragmentation and improvement of habitat conditions across the landscape.

Further, the proposed action is expected to limit unfavorable impacts to the species, and to maintain and enhance habitat at both the population and landscape level. In conclusion, the anticipated levels of adverse effects are more than offset by the implementation of conservation practices for the benefit of LPC as modified by the agreed-upon conservation measures.

CONCLUSION

After reviewing the current status of the LPC, the effects of the proposed action, and the expected cumulative effects, it is the Service's Conference Opinion determination is that the proposed action, which incorporates the planning processes, procedures, practice standards, and conservation measures as identified here, is not likely to jeopardize the continued existence of the LPC. We base our conclusion on the following:

1. The implementation of the LPCI is expected to produce a net conservation benefit to the LPC and other covered species by improving and increasing available habitat.
2. Demand from landowners for participation in the LPCI and WLFW and resulting acres treated with conservation practices benefiting LPC is expected to increase.

3. Effective implementation of LPCI conservation practice standards and associated conservation measures are anticipated to result in a positive population response by the species. This positive response is expected as habitat fragmentation is reduced and habitat conditions are improved across the landscape.
4. The ancitipated long-term conservation benefits to LPC populations resulting from the targeted conservation systems approach will likely contribute to the reduction of threats to the LPC at a landscape scale and will overcome any short-term adverse effects to individual LPC that may result from the implementation of LPCI practices.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this incidental take statement.

Approach to Assessing Incidental Take

In a large-scale program with birds that can move easily around their varied habitat, it is very difficult to precisely estimate the number of birds that are likely to be exposed to impacts from the proposed action. In addition, once a bird is exposed, it is difficult to determine the individual bird's response to the impact. Below we describe the method that Service and NRCS has used to approach those issues. We recognize that the resulting simple estimate is based on many assumptions, including an assumption that the birds are evenly distributed across the habitat in an ecoregion and that all birds have an equal probability of being exposed to the various practices. When evaluating a range of values we chose to use the numerical values that represent greater amount of effect. We recognize that these assumptions will likely lead to an overestimate of potential effects to the species rather than an underestimate of effects. However, we know of no more reasonable method for arriving at an estimate. Also, regarding the probability of overestimating the impact - this provides a cautious and reasonable "worst case" analysis for meta-population effects. If the likely overestimate is still compatible with survival and recovery of the LPC, then we can be satisfied that the actual impacts are compatible.

Amount or Extent of Take

In the analysis above, it was determined that six conservation practices rose to the level of "likely to adversely affect" the species. Those practices are brush management, prescribed burning, prescribed grazing, forage harvest management, range planting and fencing and are summarized briefly below.

Brush management is a tool designed to remove or reduce woody species from prairie or grassland sites, primarily focused on eastern red cedar, honey mesquite, and in limited cases thinning of shinnery oak. Practices vary depending on the goal of the producer and needs of the species but include hand felling with chain saws as well as the use of small to large tractors with special shearing devices (see Appendix IV). In the limited case of herbicide treatment for shinnery oak thinning, there is specific guidance to maintain the integrity of the habitat for LPCs. Incidental take estimates are based on the practices with largest potential disturbance (destroying nests and/or incubating hens), use of heavy machinery. Thus, it is likely overestimating incidental take. Although published research/management studies designed to precisely quantify the effects of habitat manipulation such as brush management on the species are lacking, Pitman (2003) documented 1 female (of 209 nests) LPC having been killed by farm machinery cutting the alfalfa field where she had nested. The Service believes this evaluation represents the best available information on these sources of risk to the species and has prepared an incidental take estimate in accordance with the approach and results from Pitman (2003).

Prescribed burning is often used in conjunction with brush management but may also be used as a stand-alone tool for improving rangeland conditions. The potential disturbance associated with this practice is the destruction of nests if the fire is conducted during the nesting season. Although published research/management studies designed to precisely quantify the effects of prescribed burning on the species are lacking Augustine and Sandercock (2011) documented 2 of 34 greater prairie-chicken nests were lost to prescribed fires in the Flint Hills of Kansas. The Service believes this evaluation represents the best available information on these sources of risk to the species and has prepared an incidental take estimate in accordance with the approach and results from Augustine and Sandercock (2011).

Prescribed grazing is a widely used management practice to improve the quality of forage for livestock, and when applied through LPCI to improve rangeland vegetation to meet the habitat needs of LPC. Pitman et al (2005) documented 4 of 209 nests were lost to trampling by cattle. Some but not all of the items in a grazing management plan are rest and deferment periods, stocking rates, location of mineral/salt supplements, and consideration of riparian and other sensitive or high impact areas. As a result of the expected implementation of the Prescribed Grazing system (528) guided by the 645 standard and as conditioned by the other conservation measures, the Service does not anticipate incidental take coverage is needed for any potential sources of adverse affect noted in the above analysis except for those related to livestock trampling.

Range planting is applied to restore the native plant community to a condition similar to the ecological site description reference state for the site, provide or improve forages for livestock and browse or cover for wildlife, reduce erosion by wind and/or water, improve water quality and quantity, and increase carbon sequestration. This practice is used to restore important native

habitats by converting cropland to grasslands, to meet habitat requirements for LPC. As with *Brush Management*, the Service anticipates that incidental take estimates for *Range Planting* actions are based on the practices with largest potential disturbance (destroying nests and/or incubating hens), use of heavy machinery. Thus, it is likely overestimating incidental take. Although published research/management studies designed to precisely quantify the effects of this type of mechanized habitat management action on the species are lacking Pitman (2003) documented 1 female (of 209 nests) LPC having been killed by farm machinery cutting the alfalfa field where she had nested. We believe similar rates of incidental take for the *Range planting* practice can be expected. The Service believes this evaluation represents the best available information on these sources of risk to the species and has prepared an incidental take estimate in accordance with the approach and results from Pitman (2003).

Forage harvest management is the timely cutting and removal of forages from the field as hay, green-chop, or ensilage to optimize economic yield of forage, maintain and/or improve wildlife habitat, promote vigorous plant re-growth, maintain life of the stand, use the forage plant biomass as a soil nutrient uptake tool, and to control insects, diseases, and weeds. The practice applies to all land uses where machine harvested forage crops are grown. As with *Brush Management* and *Range Planting*, the Service anticipates that incidental take estimates for *Forage Harvest Management* actions are based on the practices with largest potential disturbance (destroying nests and/or incubating hens), use of heavy machinery. Thus, it is likely overestimating incidental take. Although published research/management studies designed to precisely quantify the effects of forge harvest management on the species are lacking, Pitman (2003) documented 1 female (of 209 nests) LPC having been killed by farm machinery cutting the alfalfa field where she had nested. We believe similar rates of incidental take for the *Forage Harvest Management* practice can be expected. The Service believes this evaluation represents the best available information on these sources of risk to the species and has prepared an incidental take estimate in accordance with the approach and results from Pitman (2003).

Fences have been documented as collision risk to LPC (Wolfe et al. 2007) and greater sage-grouse (Stevens et al. 2011) impacts to populations are not well documented. Fences can be a valuable tool to facilitate improved grazing management providing for improvement in LPC habitat. However, marking fences to increase their visibility can reduce collision risk by 83% (Stevens et al. 2011). Thus, a marked fence per the guidance in LPCI Conference Opinion will result in approximately 0.64 strikes per mile of fence.

Estimating Exposure

To approximate the number of birds that may be exposed to the impacts, we started with the bird density (per eco-region) as estimated from the upper 90% confidence interval of each eco-region identified in the rangewide plan via range-wide aerial surveys in 2012 (McDonald et al.2014. That produced a density (per acre) of LPC (Tables 6 and 7, column 3). Next we examined the number of acres for each of the last 3 years on which five of the six practices were implemented (in each ecoregion) by participants in LPCI, and chose the highest number of acres treated in a year (Table 6, column 4). We did the same for landowners applying the practices in the Action Area who were not participating in LPCI (Table 7, column 4). Since there have been no acres of Forest Harvest Management implemented over the past 3 years, we used the anticipated future

use estimate from NRCS for the number of acres treated in a year. The future enrollment in LPCI is difficult to predict, but we anticipate a doubling of the number of acres under each practice into the future over the 30-year life of the project. (Table 6, column 5). We also doubled the number of acres of each practice being applied in the Action Area by landowners not participating in LPCI (Table 7, column 5). By multiplying the bird density times the acres where a given practice was applied, we arrive at an approximate number of birds that were exposed to the practice (Tables 6 and 7, column 6).

Estimating Birds Subject to Incidental Take

Not all birds exposed to the practices, will experience adverse effects that reach the level of take. Many adverse effects will be in the form of short-term behavioral responses ranging from flushing, temporary changes behavior, interruptions in feeding, stress, etc., resulting in insignificant and discountable effects that do not rise to the level of take. Though scientific studies are scant on the effects of the proposed practices, we have used the available information on rates of injury or mortality to inform our approximation of the number of birds taken incidentally by the proposed action. By multiplying those rates (if possible specific to the practice or similar impact) by the number of birds exposed to that practice, we can approximate the number of birds (rounded to whole numbers) injured or harmed (Tables 6 and 7, column 8). Fencing was estimated in a similar manner but regional density was not considered, because of the difficulty in developing reasonable assumptions about length of fence, proximity of leks etc., Thus, incidental take was estimated by multiplying the strike rate for sage-grouse of 0.64 strikes per mile of marked fence.

The estimated annual incidental take of LPC from the proposed action in the future using the assumptions identified above is 282 birds, which is 1.1 percent of the average population estimate 25,462 from 2012-2014. Take will be monitored annually by practice and by ecoregion, but reinitiation of consultation will only be required if the total annual take estimated for all ecoregions and practices in Tables 6 and 7 exceeds 282. The amount of estimated annual take during the 30-year life of the project may be adjusted based on monitoring of contracts and research that provides additional information on rates of injury or mortality.

TABLE 6. Acreages of practices implementedthrough LPCI, LPC density (birds/acre) used to estimate numbers of individuals "at risk" of adverse effect, and estimated annual incidental take.

Practice	Ecoregion	Density (birds per Acre) per McDonald	Practice Acres	Practice acres doubled for future expansion	Number of birds exposed to Practice with future	Rate of injury or mortality for Practice	Total number of birds injured or killed[a]
Brush Management	Mixed Grass	0.0017	24,648	49,296	84	0.0048	1
	Shortgrass	0.0063	6,509	13,018	82	0.0048	1
	Shinnery-Oak	0.0016	47,520	95,040	152	0.0048	1
	Sandsage	0.0015	291	582	1	0.0048	1
Prescribed Burning	Mixed Grass	0.0017	23,800	47,600	81	0.0588	5
	Shortgrass	0.0063	13,589	27,178	171	0.0588	11
	Shinnery-Oak	0.0016	49	98	0	0.0588	1
	Sandsage	0.0015	2,208	4,416	7	0.0588	1
Prescribed Grazing	Mixed Grass	0.0017	203,526	407,052	692	0.0191	14
	Shortgrass	0.0063	55,539	111,078	700	0.0191	14
	Shinnery-Oak	0.0016	143,088	286,176	458	0.0191	9
	Sandsage	0.0015	65,126	130,252	195	0.0191	4

Range Planting	Mixed Grass	0.0017	1,556	3,112	5	0.0048	1
	Shortgrass	0.0063	1,807	3,614	23	0.0048	1
	Shinnery-Oak	0.0016	3,005	6,010	10	0.0048	1
	Sandsage	0.0015	2,527	5,054	8	0.0048	1
Forage Harvest Management[b]	Mixed Grass	0.0017	20,600	41,200	70	0.0048	1
	Shortgrass	0.0063	5,400	10,800	68	0.0048	1
	Shinnery-Oak	0.0016	2,000	4,000	6	0.0048	1
	Sandsage	0.0015	3,600	7,200	11	0.0048	1
Fence	Mixed Grass	0.0017	20 miles	40 miles		0.64 strikes/mi	26
	Shortgrass	0.0063	30 miles	60		0.64	39
	Shinnery-Oak	0.0016	4 miles	8		0.64	6
	Sandsage	0.0015	8 miles	16		0.64	11
TOTAL							**153.0**

[a]Totals based on assuming at least 1 incident of take occurs in cells where calculations resulted in take of a fraction (<1) of a bird.

[b] Acres identified for the Forage Harvest management conservation practice are future estimates. No acres were treated under this practice between 2010 and 2012.

TABLE 7. Acreages of practices implemented by landowners in LPC Action Area but not participating in LPCI, LPC density,numbers of individuals "at risk" of adverse effect, and estimated annual incidental take.

Practice	Ecoregion	Density (birds per Acre) per McDonald	Practice Acres	Practice acres doubled for future expansion	Number of birds exposed to Practice with future expansion	Rate of injury or mortality for	Total number of birds injured or killed[a]
Brush Management	Mixed Grass	0.0017	3,236	6,472	11	0.0048	1
	Shortgrass	0.0063	855	1,709	11	0.0048	1
	Shinnery-Oak	0.0016	6,239	12,478	20	0.0048	1
	Sandsage	0.0015	38	76	0	0.0048	1
Prescribed Burning	Mixed Grass	0.0017	13,029	26,058	44	0.0588	3
	Shortgrass	0.0063	7,439	14,878	94	0.0588	6
	Shinnery-Oak	0.0016	27	54	0	0.0588	1
	Sandsage	0.0015	1,209	2,418	4	0.0588	1
Prescribed Grazing	Mixed Grass	0.0017	114,430	228,859	389	0.0191	8
	Shortgrass	0.0063	31,226	62,452	393	0.0191	8
	Shinnery-Oak	0.0016	80,449	160,898	257	0.0191	5
	Sandsage	0.0015	36,616	73,232	110	0.0191	3
Range Planting	Mixed Grass	0.0017	893	1,786	3	0.0048	1
	Shortgrass	0.0063	1,037	2,074	13	0.0048	1
	Shinnery-Oak	0.0016	1,725	3,449	6	0.0048	1
	Sandsage	0.0015	1,450	2,9014	4	0.0048	1

Forage Harvest Management[b]	Mixed Grass	0.0017	20,600	41,200	70	0.0048	1
	Shortgrass	0.0063	5,400	10,800	68	0.0048	1
	Shinnery-Oak	0.0016	2,000	4,000	6	0.0048	1
	Sandsage	0.0015	3,600	7,200	11	0.0048	1
Fence	Mixed Grass	0.0017	20 miles	40		0.64 strikes/	26
	Shortgrass	0.0063	30 miles	60		0.64	39
	Shinnery-Oak	0.0016	4 miles	8		0.64	6
	Sandsage	0.0015	8 miles	16		0.64	11
TOTAL							**129.0**

[a]Totals based on assuming at least 1 incident of take occurs in cells where calculations resulted in take of a fraction (<1) of a bird.

[b] Acres identified for the Forage Harvest management conservation practice are future estimates. No acres were treated under this practice between 2010 and 2012.

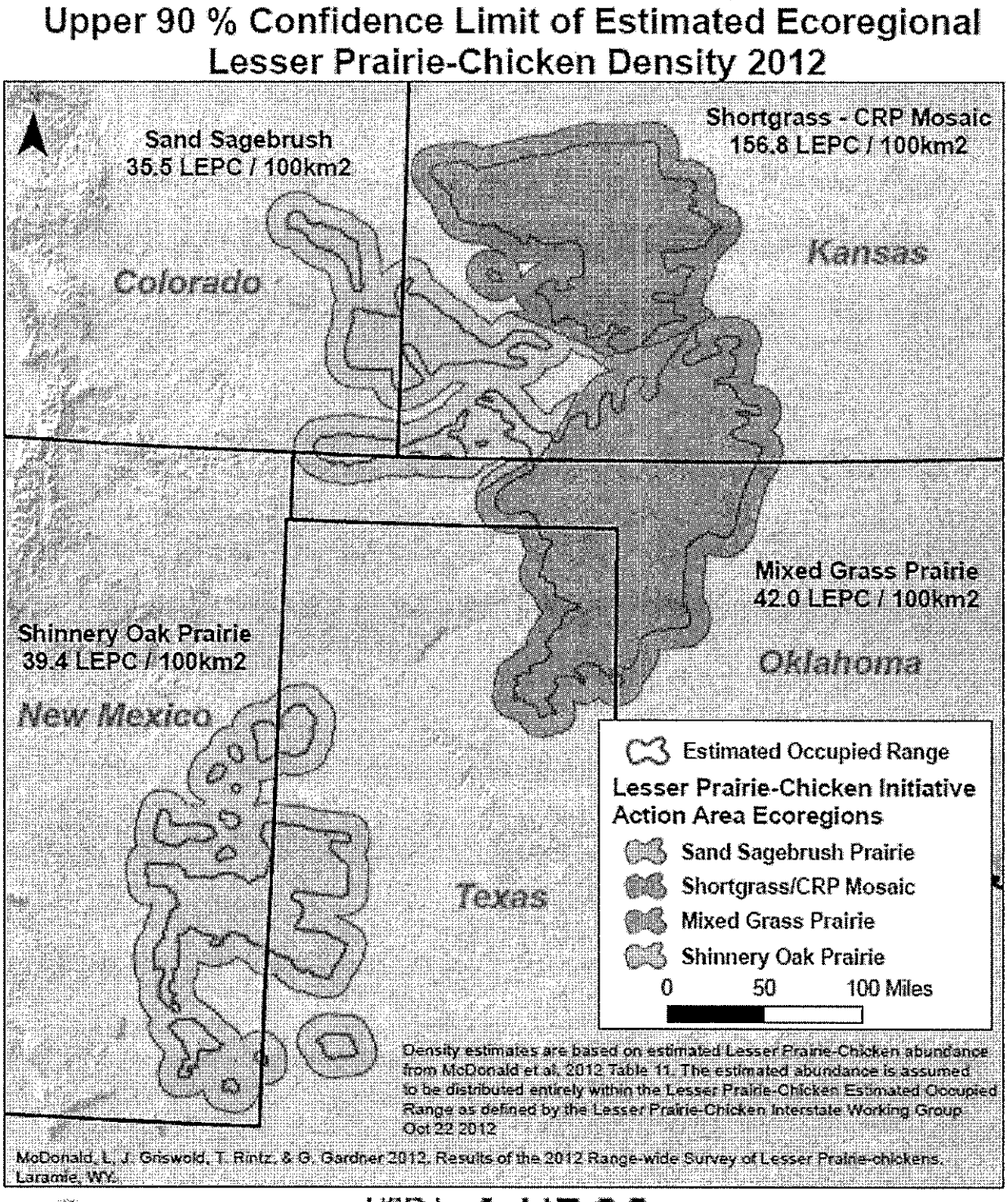
Monitoring Take

Take will be estimated using ongoing extrapolation per the calculations above as acreages (miles) of practices are implemented yearly and will be reported back to USFWS. Additionally, ongoing detailed research conducted by independent scientists will be evaluating the effectiveness of these practices with the use of radiomarked birds. Any mortality or nest loss of radiomarked birds associated with these practices will assist in further informing these extrapolated take estimates. Finally, as NRCS field staff conduct their annual field review of an LPCI contract with any of these practices, they will ask the landowner if they have observed any mortality or nest loss while implementing the practices as described in the Opinion.

Important considerations regarding take estimates

As mentioned earlier, the Service and NRCS recognize the assumptions inherent in these calculations, and that it likely creates a overestimate of birds taken. Additionally, the estimates are calculated to show numbers based on a "doubling" of the program. That doubling is not likely to occur in year 1 of the program, and thus the maximum estimates above represent take for a future point several years into the program. This is important to note, because as the program is implemented, the expectation is that the improved habitat will increase the success of LPC. Thus, even though we have reviewed that estimate relative to the current condition of the species, as we reach the extent of take estimated above in the future, the status of species across its range should be improving, reducing the overall effect of that take to the species as a whole.

Map 3. Lesser Prairie-Chicken Initiative (LPCI) Action Area and bird density.



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Effect of the Take

In the accompanying opinion, we have determined that the level of anticipated take is not likely to result in jeopardy to the LPC. The total number of acres treated annually under the six practices evaluated in this Opinion is not expected to exceed 1,252,766 acres and 62 miles of fence under LPCI and 662,994 acres and 62 miles of fence for landowners applying practices in the Action Area, but outside of LPCI. Using the existing bird densities and mortality/injury rates, we do not expect the total number of birds injured or killed to exceed 282 birds annually.

Although we anticipate some nests, eggs and chicks may be destroyed, second nesting attempts are likely when the first attempt is lost due to take. These renesting attempts likely will minimize these aforementioned adverse consequences on abundance of LPC throughout the Action Area. Most importantly, the Service concludes that implementation of the conservation practices as conditioned by the conservation measures should ultimately result in an overall increase of habitat quantity and quality in the long term. The expected improvements in habitat quantity and quality will result in concurrent increases in LPC abundance (through greater adult and juvenile survivorship, improved nest success, and recruitrnent rates) and distribution of LPCs in the action area. The anticipated increase in abundance of LPCs as a result of the LPCI (and to a lesser extent actions outside of the LPCI) should, in tum, result in a net reduction in the effect of anticipated take. Incidental take, therefore, is not expected to nullify the conservation benefits anticipated to accrue under the proposed action . Conversely, we expect the long-term benefits of the LPCI will greatly outweigh the anticipated short-tenn adverse effects of anticipated take.

REASONABLE AND PRUDENT MEASURES

The Service believes that the following reasonable and prudent measures and their implementing terms and conditions are necessary and appropriate for NRCS to minimize impacts of incidental take of LPC and other listed species identified in Table 3. In order to be exempt from the prohibitions of Section 9 of the ESA, the NRCS must ensure that implementation of the the LPCI complies with the following terms and conditions which implement the Reasonable and Prudent Measures.

The Service believes that the following Reasonable and Prudent Measures are necessary and appropriate to minimize impacts of incidental take of LPC:

Reasonable and Prudent Measure 1 - The NRCS shall report the estimated incidental take of LPC based on the acres/miles of conservation practices implemented annually within the Action Area.

Reasonable and Prudent Measure 2 - The NRCS shall report any mortality or nest loss resulting from implementation of the conservation practices described in this Opinion.

Term and Condition 1 for Reasonable and Prudent Measure 1

The NRCS shall conduct monitoring and reporting of incidental take as follows. By March 1 of each year for the term of the proposed action, the NRCS shall submit a report to the Service describing estimated incidental take of LPC in the Action Area during the previous fiscal year by ecoregion and conservation practice using the format in Table 6. The report will be submitted to the Assistant Regional Director for Ecological Services in Albuquerque, NM. The report will include actual practice units implemented and not any estimate of future implementation. Any revisions to bird density, the rate of injury or mortality, or the six conservation practices contained in Table 6 will be made in coordination with the Service.

Term and Condition 1 for Reasonable and Prudent Measure 2

Any observations or evidence of LPC mortality or nest loss resulting from implementation of LPCI conservation practices as reported by landowners, TSPs, NRCS, Service and State agency field staff, or researchers shall be included with the monitoring report from Term and Condition 1 for Reasonable and Prudent Measure 1. Within 90 days of receiving the monitoring report from NRCS, the Service will meet with NRCS to determine if changes to the calculation of incidental take or the practices included in the calculation of incidental take are necessary. This meeting will also be used to evaluate the progress, successes, and challenges of implementing the LPCI.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the ESA directs Federal agencies to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency actions. The Service offers the following conservation recommendations:

Develop an implementation process to ensure local NRCS and affected Service offices have the appropriate level of training and understanding of the conservation measures, the use of the monitoring elements as proposed, and other operational components identified in theis Biological Opinion. The Service's Partners for Fish and Wildlife Program will continue to closely coordinate with NRCS to help implement the LCPI and related conservation efforts.

As the science support and monitoring elements of the LPCI begin to produce information and data, NRCS will share this information with a wide range and diverse collection of partners (State Fish and Wildlife Agencies, Association of Fish and Wildlife Agencies, Western Association of Fish and Wildlife Agencies, Western Governors Association, and others) to further enhance the conservation outcomes of the LPCI.

Working lands easements such as the NRCS Farm and Ranchland Protection Program and the Grasslands Reserve Program would enhance current LPCI efforts by providing a mechanism for delivering long-term benefits to the LPC and sustainable ranching.

REINITIATION NOTICE

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

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AUG 13 2014

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List of Acronyms

CEAP – Conservation Effects Assessment Project
CHAT – Crucial Habitat Assessment Tool
CRP – Conservation Reserve Program
EQIP –Environmental Quality Incentives Program
ESA – Endangered Species Act
FSA - Farm Service Agency
GIS – Geographic Information System
LPC – Lesser Prairie-Chicken
LPCI – Lesser Prairie-Chicken Initiative
NGO – Non-Governmental Organization
NRCS – Natural Resources Conservation Service
NRI - Natural Resources Inventory
RMS – Resource Management System
SWAT – Strategic Watershed Action Teams
WHEG – Wildlife Habitat Evaluation Guide
WHIP – Wildlife Habitat Incentives Program

Appendices

I. NRCS –Endangered Species Act (ESA) policy
II. NRCS - Conservation Planning
III. LPCI Science Support Element
IV. Comprehensive Analysis of Each Conservation Practice Standard in the Conference Opinion
V. Listed, Candidate, and Proposed Species Occurring in the LPCI Action Area
VI. Environmental Evaluation Worksheet (NRCS-CPA-52)
V11. Flow Chart Demonstrating When Measures and Benefits of LPCI Conference Opinion Apply
VIII. Letter from USFWS Describing Conditions for Providing 30-year Predictability under Working Lands for Wildlife
IX. USFWS Technical White Paper on Conservation Needs of the LPC

APPENDIX I – NRCS Endangered Species Act (ESA) Policy

Section 7(a) (1)
NRCS, as required by ESA, is committed to the utilization of its authorities in furtherance of the ESA purposes by carrying out programs for the conservation of threatened and endangered species.

As appropriate, NRCS assists in the development of species recovery plans, develops National and State policy, and uses its conservation and technical assistance programs to conserve species and habitat protected by the ESA.

NRCS meets much of its Section 7(a)(1) responsibilities to carry out programs for the conservation of endangered and threatened species on a programmatic basis by involving Fish and Wildlife Service and NMFS in NRCS State Technical Committee meetings and in local work group meetings. Their participation with these groups augments other discussions that NRCS has with the Fish and Wildlife Service and NMFS regarding the conservation of specific protected species.

On a site-specific basis, NRCS also uses its authorities to support Section 7(a)(1) requirements by implementing conservation recommendations the Service makes during the Section 7(a)(2) consultation process.

Section 7(a)(2)
The following summarizes NRCS' consultation protocol under 2 scenarios: 1) Technical assistance only, and 2) in situations where NRCS in some way controls the action (includes financial assistance):

(1) NRCS Technical Assistance Only
There is no requirement to consult on a site-specific basis when NRCS provides technical assistance only. NRCS technical assistance activities provide information and advice to recipients regarding the utilization of their resources. In such cases, NRCS does not control the action that is ultimately taken, and therefore technical assistance does not fall within the parameters of an agency action subject to section 7(a) (2) consultation.

However, NRCS policy in GM 190 Part 410 B-410.22E(5)(i)(ii) requires consultation when NRCS technical assistance provides the basis for NRCS financial assistance, and the proposed action(s) may affect listed species and/or critical habitat.

When providing site-specific technical assistance, NRCS personnel must still refer to Section 2 of the Field Office Technical Guide, other existing maps, habitat criteria, and other available information to determine whether protected species or designated critical habitat are present. NRCS personnel must also refer to this information to determine whether proposed or State-listed species of concern or the habitats on which they depend, are also present.

Circumstances that may prompt discontinuation of service to a client: If NRCS determines that there may be an adverse impact on a listed species or designated critical habitat as a result of the

recipient voluntarily implementing a conservation system, NRCS will recommend an alternative conservation treatment that avoids the adverse impact. If the landowner pursues a conservation system that adversely affects a protected species, NRCS field staff will inform the client about their obligation to contact the Fish and Wildlife Service or NMFS, as appropriate, to determine whether there is a need for a Habitat Conservation Plan (HCP) (see Section 610.104) to avoid violating the ESA. NRCS will not provide assistance for those conservation practices or systems that will cause an adverse effect unless the landowner obtains an HCP and an incidental take permit.

(2) NRCS-Controlled Action (includes financial assistance)
If a proposed action funded by NRCS may affect a listed species or designated critical habitat, NRCS must initiate consultation with the Fish and Wildlife Service or NMFS, as applicable. A table of listed and candidate species that occur within the LPC Action Area is found in Appendix V.

Consultation may be formal or informal depending on the circumstances and shall be conducted whether the effect is beneficial or adverse. The consent of the landowner and land user shall be obtained before initiating site-specific consultation.

Circumstances that may prompt discontinuation of service to a client: If the landowner or land user is unwilling to consent to NRCS initiating the consultation process, and decides to implement conservation practices or measures that will result in adverse effects to listed species or will modify designated critical habitat, NRCS will not provide financial or technical assistance for those conservation practices or systems that will cause the adverse effects.

NRCS personnel are responsible for determining whether or not a proposed action will have an effect on listed species or designated critical habitats.

In making a determination, field staffs should utilize existing resources such as maps identifying protected species' ranges and designated critical habitats, information from the Fish and Wildlife Service and NMFS regarding listed species and designated critical habitats, and any other appropriate, reliable information. The "best scientific and commercial data" must be considered in making this determination.

Landowner Consent Form
Before initiating site specific consultation, NRCS must obtain the written consent of the landowner and land user, or just the land user when the land user provides written indication of having complete control over the land. This signed form along with all other pertinent correspondence relevant to the consultation should be maintained in the "administrative file" that is kept with the client's conservation plan.

Addressing Candidate Species
Candidate Species are not protected under the ESA, although the Fish and Wildlife Service and NMFS encourage the formation of partnerships to conserve candidate species. NRCS policy also suggests that States set priorities for addressing candidate species. Conferencing for actions that

may adversely impact a candidate species is optional. However, when considering impacts to candidate species it is important to note that:

Some candidate species may be protected by State or Tribal law; NRCS policy requires that when providing technical and financial assistance NRCS will recommend only alternative conservation treatments that will avoid or minimize adverse effects, and to the extent practicable, provide long-term benefit to the species. If the landowner chooses not to accept and implement alternative conservation measures that would avoid or minimize adverse effects, then NRCS will terminate technical and financial assistance. (General Manual 190 Part 410.22(E)(7)); and

If Conference or Biological Opinions exist between Fish and Wildlife Service and/or NMFS and NRCS that address candidate species in an area where NRCS may be asked for assistance, NRCS must follow and adhere to any conservation measures outlined in the Conference Opinion or Opinion. Should the client or landowner choose to apply conservation measures other than those outlined in the Conference Opinion or Opinion, NRCS will inform the client and landowner of the NRCS policy to adhere to Conference Opinion or Opinion conservation measures and shall terminate assistance for the action or portion of the action potentially affecting the candidate species, or NRCS may initiate a new Conference Opinion or Opinion with the appropriate Service(s).

If a candidate species becomes federally listed, proposed for listing, or the critical habitat is federally designated or proposed prior to the completion of an action, the project will be halted while the necessary consultation or conferencing requirements are met.

APPENDIX II – NRCS Conservation Planning

Local NRCS conservation planners develop conservation plans for clients that address environmental resource concerns on private, non-Federal, or Tribal lands. NRCS conservationists help individuals and communities to take a comprehensive approach to planning the proper use and protection of natural resources on these lands through a nine-step planning process described in the NRCS "National Planning Procedures Handbook" and illustrated in Figure 1.

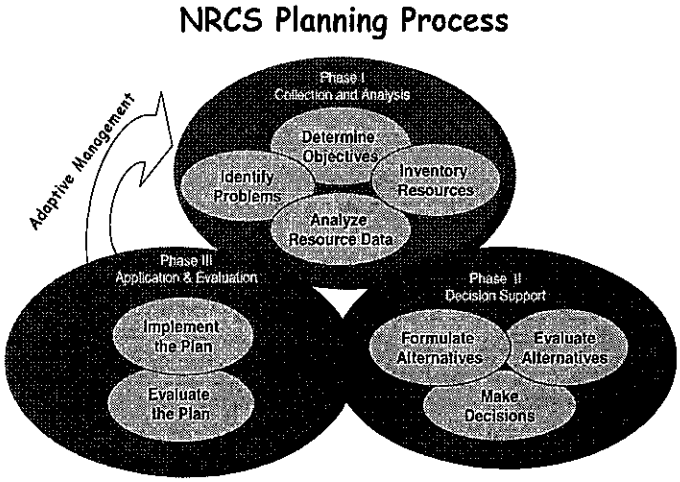

Figure 1. NRCS Planning Process

As part of this conservation planning effort, individual environmental reviews called Environmental Evaluations (EE) are completed which inform the conservation planning effort and assist the Agency's compliance with NRCS regulations that implement NEPA. See Environmental Evaluation Worksheet (NRCS-CPA-52) in Appendix VI. The EE is a concurrent part of the planning process in which the potential long-term and short-term impacts of an action on people, their physical surroundings, and the natural environment are, evaluated and alternative actions explored. The EEs and conservation plans are developed to assist the client in making decisions and implementing the conservation practices identified in the conservation plan. A Conservation plan is a record of the client's decision to implement of one or more conservation practices which prescribe the actions necessary to address the identified resource concerns in need of treatment.

Conservation Practices

NRCS provides technical and financial assistance by planning and designing conservation practices that achieve the identified conservation needs. Each conservation practice has an established standard, which is contained in the Field Office Technical Guide and includes the following elements:

- definition and purposes of the practice,
- conditions in which the practice applies,
- minimum criteria to be applied supporting each purpose,
- additional elements to be considered,

- required plans and specifications, and
- operation and maintenance requirements

See the conservation practices eligible for application in the LPCI area in Appendix IV.

NRCS practice standards are developed at the national level and establish the minimum level of acceptable quality for planning, designing, installing, operating, and maintaining a conservation practice. These standards are developed through a multi-disciplinary science-based process in order to maximize the success and minimize the risk of failure of the conservation practice. When a conservation practice standard is developed or revised at the national level, NRCS publishes a notice in the Federal Register of the availability of the standard for review and comment for a period of not less than 30 days from the date of publication. Standards from the "National Handbook of Conservation Practices" and interim standards are used and implemented by States, as needed, and may be modified to include additional requirements to meet Federal, State, Tribal, or local needs. Because of wide variations in soils, climate, and topography, States can revise these national standards and develop specifications to add special provisions or provide additional details in the conservation practice standards. State laws and local ordinances or regulations may also dictate more stringent criteria; in no case, however, are the criteria of the national conservation practice standard reduced. For the LPCI, conservation practices have been modified to include additional conservation measures necessary to mitigate impact and/or to assist in the recovery of the species. See Appendix IV for conservation measures associated with each practice.

Conservation planning in the LPCI Action Area

The LPC Habitat Flow Chart or other documentation shall be utilized to determine if there is potential LPC habitat or presence. If the potential for LPC habitat is determined (green box result on the LPC Habitat Flow Chart) conservation planning shall include all conservation measures identified in the conference opinion. If it is determined the affected acres are not and will not constitute LPC habitat and there is not a potential to affect this shall be documented and NRCS conservation planning/assistance may proceed without requiring the conservation measures outlined in the conference opinion.

Ecological Sites

An Ecological Site is a conceptual division of the landscape defined as "a distinctive kind of land with specific soil and physical characteristics that differs from other kinds of land in its ability to produce distinctive kinds and amounts of vegetation and in its ability to respond similarly to management actions and natural disturbances" (draft Interagency Ecological Site Handbook for Rangeland). The ecological site is used to define, quantify, and document relationships among local climate, landform, elevation, slope, aspect, parent material, soil, disturbance regimes, and vegetation. An ecological site description (ESD - hyperlinked) is a report containing the information and data associated with each ecological site.

The fundamental assumption underlying ecological sites is that soils, climate, and geomorphology can be correlated with sufficient precision to provide a site-specific basis for

successful ecological predictions and management decisions. Knowledge of how management and disturbance processes interact with abiotic and biotic factors is critical to understanding ecological processes and relationships. A state-and-transition model (STM) within each ESD is a diagram displaying those relationships (Townsend 2010).

STMs are descriptions of the vegetation dynamics occurring within specific ecological sites. STMs consist of a diagram and associated narratives that describe these dynamics. STMs are organized as a collection of alternative stable states that represent the potential vegetation communities an individual ecological site may support. A state is defined as a suite of community phases occurring on similar soils that interact with the environment to produce persistent functional and structural attributes associated with a characteristic range of variability. Each state contains one or more community phases representing dynamics within that state. Dynamics among community phases may be driven independently or in combination by natural events or human activities. States are separated by thresholds that can be induced by natural or human events. Thresholds represent conditions sufficient to modify ecosystem structure and function beyond the limits of ecological resilience. Ecological resilience being defined as the amount of change or disruption that is required to transform a system from being maintained by one set of mutually reinforcing processes and structure to a different set of processes and structures. Ecological resilience of states can be reduced by improper land management practices (e.g., fire suppression, reduction of soil protection, and species introduction) or extreme environmental conditions (e.g., multiyear drought, intense storm events, insect and disease outbreaks), either independently or in combination (Briske et al. 2008).

The STM summarizes the existing knowledge and hypotheses of an ecological site's functional and structural attributes and its responses to disturbances and stresses. STMs can be used as guides in developing management strategies to maintain desired states, enhance movement from one state to another state, and to identify indicators to be monitored for the purpose of maintaining or changing states.

Ecological sites and their descriptions provide a consistent framework for stratifying landscapes and describing soil, vegetation, and abiotic features; delineating units that share similar capabilities to respond to management activities and disturbance processes; and estimating ecosystem services that can be expected from particular soil/vegetation combinations (Townsend 2010).

Wildlife Habitat Evaluation Guides (WHEG)

Wildlife Habitat Evaluation Guides (WHEG) are tools that are developed at the NRCS state level, and utilized by field personnel, to assess existing habitat conditions and identify limiting habitat factors in the planning area. WHEGs are species-specific. The objective of the WHEG is to evaluate habitat conditions that provide for the life requisites of the wildlife species under consideration and to inform alternative formulation and effects analysis. It is NRCS policy for each state to have a wildlife habitat evaluation protocol to be used in planning the upland Wildlife Habitat Management Standard (645). The standard also requires that the alternatives address the limiting factors in their order of significance, as indicated by the habitat evaluation. The WHEG's are named in a manner that may use terminology such as "evaluation",

"appraisal"," assessment", or "habitat suitability model". They usually take a form similar to Habitat Suitability Index Models (F&WS Ecological Services Manual, Habitat as a Basis for Environmental Assessment, 1980) and often include variables that are relatively easy for non-biologist staff to collect while in the field. Many of these are species-specific for important wildlife common within each state, but there are also some "general" habitat assessment models that evaluate habitat on agricultural working lands where the landowner has not expressed an interest in a particular species.

Two WHEGs have been developed for evaluation of LPC habitat. These WHEGs are specific to the type of habitat being evaluated, one if for use in Sand Sage and short/mid grass habitats and the other if specific to Sand Shinnery in the southern reaches of the range. The appropriate WHEG will be completed whenever a completed LPC Habitat Flow Chart reaches the appropriate box indicating the presence or possible presence of LPC habitat.

The actual WHEGs are found at the following internet address:

http://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/programs/initiatives/?cid=nrcsdev11_023912

APPENDIX III – LPCI Science Support Element

Monitoring LPCI Effectiveness

Monitoring the effectiveness of LPCI will occur at multiple scales and will address both vegetation and population responses. Evaluation tools will be developed to monitor outcomes and effectiveness.

At the broad scale, the area affected by a particular treatment will be documented to the smallest unit possible without violating privacy rules of NRCS. Affected area will be recorded in acres (e.g., prescribed fire), linear feet (e.g., marked fence), or numbers of units (e.g., escape ramps). Preferably these metrics would be based on geographic units (i.e., a watershed), or priority areas (per the DSS) and not administrative units. This framework will more directly link these affected areas to populations.

Changes in lek attendance (i.e., male abundance) and/or lek distribution will be used to assess the effects of conservation actions in specific priority areas or geographic units.

Rigorously designed research projects will be developed such that fine scaled habitat and population vital rate responses can be measured in relation to various conservation practices, and then extrapolated to the total area affected by the practices.

Baseline assessments of vegetation will be collected at project areas consistent with NRCS LPCI habitat monitoring protocols to assess vegetation response at the individual ranch level. In turn, as multiple projects are completed a portfolio of habitat change can readily be quantified and linked back to changes in abundance and/or distribution of populations.

Science Needs

The LPCI seeks to reduce primary threat factors to LPC and minimize the uncertainty associated with NRCS Conservation Practices that will be used to address the threats. The LPCI envisions 9 potential studies (replicated across ecological zones) to better inform the outcomes and effectiveness of Conservation Practices. LPCI is seeking partners and funding resources to initiate the following studies.

1) Delineate high priority LPC habitats across the species range. State Fish and Wildlife Agencies and Playa Lake Joint Ventures (PLJVs) are developing habitat maps on behalf of the Western Governors' Association Decision Support System (DSS) program. The resulting maps will provide the context for targeting conservation practices and investments. Additionally, these maps will aid in the reporting spatially based threat reductions to the species.

2) Evaluate the benefits of Prescribed Grazing (645) to LPC populations. LPCI will seek opportunities to study the effects of prescribed grazing on LPC in mixed-grass prairies, sand sagebrush, and shinnery oak vegetation communities.

3) Evaluate the benefits of eastern red cedar control (and methods thereof) on LPC populations. LPCI will seek opportunities to study the effectiveness of various types of cedar control on vegetation communities as well as the local LPC population.

4) Fire suppression has altered vegetation communities throughout LPC range, resulting in changes in the proportion and age structure of woody plants. The application of prescribed burning to improve LPC habitat is largely untested. Thus, LPCI will seek opportunities to evaluate methods (e.g., spring vs. fall burning) of patch burning and proportions of the landscape that provide the greatest benefit for LPC.

5) Because of fire suppression, woody vegetation (i.e., sand sagebrush and/or shinnery oak) may have transitioned across ecological thresholds and are now in a "steady ecological state" in various portions of the range. Restoration of ecological states where herbaceous vegetation is dominant or co-dominant with woody vegetation is an important goal in the conservation of LPC. Thus, LPCI will seek opportunities to evaluate methods of brush management (i.e., mechanical, chemical, or fire) and proportions of the landscape in woody vegetation that provide the greatest benefit for LPC.

6) Assess the mortality risk of LPC strikes to fences and determine how to reduce threats by marking fences, and develop predictive models to identify where fences may pose the greatest threat to species.

7) Assess the risk to LPC populations of loss of acres enrolled in CRP that are converted back to annual crop production. Seek opportunities to develop predictive models of population persistence as pertains to changes in CRP acreages and landscape connectivity.

8) Identify those landscapes most at risk of conversion from agricultural land use (i.e., ranching and farming) to others uses and evaluate benefits of easements to keep those lands in production.

9) Work with National Resources Inventory (NRI) personnel in NRCS to ensure that NRI sampling and LPCI habitat assessments are comparable within respective floristic/ecological provinces.

APPENDIX IV – Comprehensive Analysis of Each Conservation Practice Standard

NOTE: For practices implemented through the Lesser Prairie-chicken Initiative (LPCI), the core practices Upland Wildlife Habitat Management (645) and Prescribed Grazing (528), when livestock are present, shall be used in all LPCI conservation plans in order to determine which, if any, facilitating conservation practices are needed, as well as the extent, location, and timing of facilitating practices to ensure that LPC habitat is maintained or improved following application.

The term *known leks*, when used in the following conservation measures, means leks that are occupied or have been recorded as active at least once within the previous five years.

If any modification of the conservation measures occur that could result in adverse effects or incidental take above what is anticipated in the associated Biological Opinion, contact the local Service Field Office to coordinate implementation and any additional compliance under the Act that may be needed.

Conservation Practice Standard: Upland Wildlife Habitat Management (645) (Core Management Practice)

Definition: Provide and manage upland habitats and connectivity within the landscape for wildlife.
Purpose: This core management practice will be applied or maintained annually to treat and manage wildlife, in particular LPC resource concerns identified during the conservation planning process. Application of this practice shall remove or reduce habitat limiting factors, in their order of significance, as indicated by results of the LPC wildlife habitat evaluation guide (see Appendix II) or other acceptable assessments. This practice alone, or in combination with facilitating practices, shall result in a conservation system that will enable the planning area to meet or exceed the minimum quality criteria for upland wildlife habitat.

Practice Application: This management practice will be implemented on up to 760,000 acres of land per year throughout the Action Area as indicated in the table below.

645 Upland Wildlife Habitat Management average anticipated usage

State	Total ac/yr
Colorado	50,000
Kansas	390,000
Oklahoma	30,000
Texas	69,000
New Mexico	50,000

Resource concern(s): Factors that reduce habitat quality or otherwise limit population growth of the targeted species.

Potential beneficial effect(s) to LPC: This core management practice will be used to restore, enhance or create, and manage for suitable habitat for the LPC; to improve habitat conditions for all life cycles, including breeding, nesting, brood-rearing, and over-wintering and to provide adequate food, cover and shelter, and address the effects of habitat fragmentation by creating, maintaining, or restoring landscape connectivity for movement.

Potential adverse effect(s) to LPC: This core management practice was developed for the primary purpose of improving wildlife habitat. When applied and managed to the standards and specification of the practice, this practice should not result in adverse conditions to the LPC or associated wildlife species.

Conservation Measures:
NRCS shall coordinate with the affected State Fish and Wildlife Agency and confer with the State Technical Committees to identify appropriate restrictions on the placement, extent, configuration, and timing of this conservation practice standard and the area where these practice restrictions would apply so as to avoid or minimize adverse effects to the LPC and supporting habitat conditions. If modification of the restrictions on the placement, extent, configuration, and timing of this conservation practice could increase the likelihood or extend to adverse effects, these modifications need to be further coordinated with the Service's local Field Office.

The best scientific data available will guide the development of this practice; to ensure effectiveness, adaptability and increased knowledge.

Utilize acceptable habitat evaluation tools and monitoring protocol such as the WHEG (see Appendix II) to evaluate habitat conditions, on a regular basis, to ensure the conservation plan is adapted to meet the habitat and wildlife needs.

Ensure all facilitating practices include critical non-disturbance dates to minimize their effects on leks and nesting periods, as appropriate to the practice.

This practice may be used to modify existing infrastructure to reduce or eliminate potential adverse effects resulting from those structures; including installation of wildlife escape ramps in open water sources or in open trenches/pits, and marking fence lines to prevent bird collision in critical areas. At the time of conference report development financial assistance for fence marking and escape ramps was provided as a component of conservation practice 645. A new conservation practice Fish and Wildlife Structures is being developed and once this practice is finalized and approved financial assistance for fence marking and escape ramps will be covered under this conservation practice.

NRCS shall ensure that plans and specifications for this practice are prepared by persons with adequate training in the fields of wildlife management, biology or range ecology.

For the purposes of the LPCI, NRCS will encourage the establishment of "permanent" photo points to serve as visual documentation of changing habitat conditions over a period of time for the life of the management system.

NRCS will work with conservation partners to implement strategies to determine habitat use by wildlife species and/or to determine estimates/indices of abundance where possible.

Conservation Practice Standard: Prescribed Grazing (528) (CORE SUPPORTING MANAGEMENT PRACTICE)

Definition: Managing the harvest of vegetation with grazing and/or browsing animals.

Purpose: When livestock grazing is present or planned, this practice is applied or maintained annually as a part of a conservation management system to achieve one or more of the following: (A) Improve or maintain desired species composition and vigor of plant communities. (B) Improve or maintain quantity and quality of forage for grazing and browsing animals' health and productivity. (C) Improve or maintain surface and/or subsurface water quality and quantity. (D) Improve or maintain riparian and watershed function. (E) Reduce accelerated soil erosion, and maintain or improve soil condition. (F) Improve or maintain the quantity and quality of food and/or cover available for wildlife. (G) Manage fine fuel loads to achieve desired conditions. (H) Promote economic stability through grazing land sustainability and continued livestock production.

In addition to the purposes above; within the LPCI, this conservation practice standard shall only be selected to support the goals and objectives of core Conservation Practice Standard Upland Wildlife Habitat Management (645). At the individual and landscape scale, the use of this practice standard under the LPCI is expected to produce a mosaic of vegetation structure and composition to benefit the LPC (e.g. create areas of greater forb and resulting insect production, create areas of higher residual cover for nesting birds, and maintain open lek habitat).

Practice Application: In creating a prescribed grazing plan, NRCS integrates landowner objectives, local resource inventories, habitat needs assessments of LPC, forage balance sheets, and ecological site description information to plan and design the practice. Further, this conservation practice standard is a management practice and it depends upon the proper application of the facilitative vegetative and structural conservation practice standards. Infrastructure improvements (fencing, pipeline, water facilities, etc.), and the implementation of other vegetative manipulation practices (forage harvest management, herbaceous weed control, prescribed fire, etc) may be implemented by NRCS to support the creation and use of a grazing management system.

Stocking rates of livestock is a fundamental component of developing a prescribed grazing plan. In additional to stocking rates, NRCS provides advice to landowners on other aspects of the management of livestock, including time of use, as well as grazing frequency, location, and duration on the property.

Using this practice standard, NRCS will work with the landowner to beneficially manage vegetation amount, structure, vigor, nutritional quality, and/or desired species composition. On-site grazing determination needs can address specific habitat targets immediately or as a part of a multi-year grazing system design which addresses long-term goals.

Throughout the Action Area, this practice will be implemented on up to 780,000 acres of land per year as indicated in the table below.

528 Prescribed Grazing average anticipated usage

State	Total ac/yr
Colorado	50,000
Kansas	390,000
Oklahoma	90,000
Texas	150,000
New Mexico	50,000

Resource concern(s): Resource concerns addressed by this practice are lack of diverse species composition and vigor of plant communities, low quantity and quality of forage for grazing and browsing animals, water quality and quantity, soil erosion, quantity and quality of food and/or cover available for wildlife, and economic stability for continued livestock production. Within the LPCI, an additional resource concern is the identification of limiting biological conditions for the LPC and the creation of a grazing management system to address the limiting biological conditions for the LPC.

Potential beneficial effect(s) to LPC: Practice assures that stocking rate is in balance with forage supply, season of use is rotated to ensure plants have adequate reproduction opportunity, and rangeland is monitored to inform adaptive management. These measures ensure that rangelands are managed sustainably to provide continued ecological processes, forage for livestock and wildlife, and habitat for wildlife, including LPC. Planned grazing systems within the LPCI are expected to increase residual cover of perennial grasses and forbs to improve the LPC nesting cover and success. Increased residual cover will also improve plant litter cover over the soil surface. Plant litter facilitates better moisture infiltration and produces more vegetative cover for nesting birds as well as increased forbs for brood habitat. Grazing system can also decrease the time any one pasture is exposed to grazing animals and people reducing the overall disturbance to individual birds.

Potential adverse effect(s) to LPC: Physical disturbance may be realized from livestock grazing or forage removal (short-term negative grazing impacts may temporarily cause birds to leave the immediate area or reduce availability of nesting cover). Additionally, mortality to individuals (adults, chicks, and/or eggs) is possible as a result of trampling and indirectly due to a flushing response of individual birds that may result in the subsequent mortality event due to the presence of a chance/opportunistic predator.

Conservation Measures:
Implementation of grazing management plans, to the extent practicable, will meet habitat conditions for each habitat type as recommended by the affected State Fish and Wildlife Agency.

Frequency- Grazing recurrence will occur at a rate necessary to create or maintain desired habitat structure. Grazing systems which prescribe high intensity or rapid forage removal will allow for adequate recovery time (non-grazed periods) to meet LPC habitat needs as recommended by the affected State Fish and Wildlife Agency.

Duration- Grazing periods (days, weeks, or months) for scheduled grazing events will be designed to address limiting habitat factors as identified by the habitat assessments for the LPC. Scheduled grazing periods will also be used to manipulate or create desired or targeted habitat conditions as recommended by the affected State Fish and Wildlife Agency.

Timing- Grazing events will be scheduled when possible to avoid potential disturbance to known breeding or lek sites.

Intensity- The amount of forage removed (or left) during any particular grazing cycle will be in keeping with the specific life cycle requirements (i.e. nesting, leking, brood rearing, etc.)

Conservation Practice Standard: Restoration and Management of Rare and Declining Habitats (643) (FACILITATING MANAGEMENT PRACTICE)

Definition: Restoring, conserving, and managing unique or diminishing native terrestrial and aquatic ecosystems.

Purpose: This facilitating management practice will be applied annually to those areas of unique or diminishing native terrestrial ecosystems; to restore their original or highest functioning condition. This practice will be used to improve the overall biodiversity of the LPC Action Area.

Practice Application: This practice will be implemented on up to 6,000 acres of land per year throughout the Action Area as indicated in the table below. This practice is commonly used to convert cropland and pastureland to native habitat.

643 Restoration & Management of Rare and Declining Habitats average anticipated usage

State	Applied During Breed/Nest Season ac/yr	Total ac/yr
Colorado	160	0640
Kansas	3,000	5,000
Oklahoma	350	500
Texas		750
New Mexico		500

Resource concerns: The loss or degradation of rare or declining native habitats.

Potential beneficial effect(s) to LPC: This practice will help to ensure a diversity of native habitat types/components, such as native grasses, forbs, and shrubs, for the LPC and other wildlife.

Potential adverse effect(s) to LPC: Short-term and occasional physical disturbance (including noise); temporary soil and vegetation disturbances; increased potential for invasive plants.

Conservation Measures:
The conservation measures identified under the core practice of Upland Wildlife Habitat Management (645) shall be used. In addition, any vegetative or structural facilitating practices used to implement this management practice will follow the conservation measures of the practice used.

NRCS shall coordinate with the affected State Fish and Wildlife Agency and confer with the State Technical Committees to identify appropriate restrictions on the placement, extent, configuration, and timing of this conservation practice standard and the area where these practice restrictions would apply so as to avoid or minimize adverse effects to the LPC and supporting habitat conditions.

Defer implementation of this conservation practice within 1/2 mile to known leks until all breeding and nesting activities are completed, typically March 1 through July 15, or as modified by State Fish and Wildlife Agency or State Technical Committee recommendations. When implementing this practice on cropland for the purpose of establishing perennial vegetation a number of activities, primarily planting, will need to take place during the primary breeding and nesting season. In these situations an effort shall be taken to complete activities with as little disturbance as possible to adjacent and surrounding existing LPC habitat. If a modification of the restrictions on the timing of this conservation practice could increase the likelihood or extend to adverse effects, these modifications need to be further coordinated with the Service's local Field Office.

Conservation Practice Standard: Access Control (472) (FACILITATING MANAGEMENT PRACTICE)

Definition: The temporary or permanent exclusion of animals, people, vehicles, and/or equipment from an area.

Purpose: Prevent, restrict, or control access to an area in order to maintain or improve the quantity and quality of natural resources.

Practice Application: This practice is applied or maintained annually as needed to protect a designated area from disturbance by animals and/or humans. For example, this practice can be utilized while vegetation is becoming established and either prior to or after another management practice, such as prescribed burning, or following a wild fire, to produce selected habitat

objectives. This practice will restrict access on up to 45,000 acres of land per year throughout the Action Area.

472 Access Control average anticipated usage

State	Total ac/yr
Colorado	1,000
Kansas	20,000
Oklahoma	2,500
Texas	350
New Mexico	0

Resource concern(s): Habitat improvement and/or protection from excessive vehicle, domestic animal or human activities.

Potential beneficial effect(s) to LPC: Practice can be an effective tool for reducing disturbance to LPCs and their habitats, such as lek areas. Access control in combination with prescribed grazing can be used to help improve vegetative structure and composition for nesting and brood rearing.

Potential Adverse Effects(s) to LPC: Reduced habitat quality may occur through long-term use of the practice without an active management strategy, which may include prescribed grazing or prescribed burning. Access control without active management could allow species such as Eastern Red Cedar, invasive shrubs and forbs, and non-native grasses to alter and degrade LPC habitat by altering species composition and structure. Practice may alter predator behavior and influence LPC survival or productivity.

Conservation Measures:
This practice standard will be designed to support other practices which will create the desired habitat conditions for the LPC as recommended by affected State Fish and Wildlife Agency. Routine follow-up will occur to monitor the effectiveness of the practice, at least annually.
If fence construction is needed to facilitate this practice, use Conservation Practice Standard 382 Fence for specific conservation measures.

Conservation Practice Standard: Forage Harvest Management (511) (FACILITATING MANAGEMENT PRACTICE)

Definition: The timely cutting and removal of forages from the field as hay, green-chop or ensilage.

Purpose: This practice may be applied annually during the forage growing season (summer), to optimize yield and quality of forage at the desired levels; to promote vigorous plant re-growth; to manage for the desired species composition; to remove soil nutrients through uptake and harvest of forage plant biomass; to control insects, diseases and weeds; and to maintain or improve LPC habitat by providing a vigorous plant community with the composition and structure needed for nesting and brood-rearing activities. This practice is most commonly used to manage the timing, frequency, and extent of forage harvest in order to maintain plant production, health and vigor. Within the range of LPC, this practice would primarily be associated with native grass hay production, but could also apply to hay crops such as alfalfa and annually planted forage species.

Practice Application: This practice will be implemented on up to 27,000 of land per year throughout the Action Area.

511 Forage Harvest Management average anticipated usage

State	Native ac/yr	Introduced Grass ac/yr	Alfalfa ac/yr	Total ac/yr
Colorado			2,000	2,000
Kansas	9,000	600		9,600
Oklahoma	8,500	6,000	500	15,000
Texas				05,000
New Mexico				0

Resource Concerns: Yield and quality of forage, plant vigor, and timing of harvest, insects, diseases and weeds are typical concerns addressed by this practice.

Potential beneficial effect(s) to LPC: This practice will be used to insure that hay fields and forages used by LPC are not cut, harvested, or otherwise disturbed during reproductive and nesting periods. The practice can also be used to designate areas that will annually remain un-harvested and to retain site specific minimum heights of residual vegetation for future use. Harvesting methods and techniques that allow LPCs to escape haying operations will also be incorporated into this practice. Finally, the practice can be used to maintain desirable plant composition and structure for food production, nesting cover, and brood rearing habitat.

Potential Adverse Effect(s) to LPC: Adverse impacts may result from cutting and harvesting forage during reproductive and nesting periods resulting in disturbance of breeding activities on lek sites and nesting hens, and the injury and mortality of hens, young brood, and eggs.

Conservation Measures:

Defer implementation of this conservation practice within ½ mile to known leks until all breeding and nesting activities are completed, typically March 1 through July 15, or as modified by State Fish and Wildlife Agency or State Technical Committee recommendations. If a modification of the restrictions on the timing of this conservation practice could increase the likelihood or extend to adverse effects, these modifications need to be further coordinated with the Service's local Field Office.

Operate machinery in a manner that allows wildlife to flush and escape by methods such as starting operations in the middle of field and working outward, and/or by modify equipment with flush bar attachments.

Leave corners, field borders, and odd areas un-harvested for supplemental cover and brood rearing habitat.

Conservation Practice Standard: Prescribed Burning (338) (FACILITATING MANAGEMENT PRACTICE)

Definition: Controlled fire applied to a predetermined area.

Purpose: Create the desired plant community phase consistent with the ecological site description that is preferable LPC habitat. Control undesirable vegetation or to manipulate desired vegetation. Prepare sites for planting or seeding. Reduce wildfire hazards. Improve wildlife habitat specifically enhance and produce desirable or needed plant communities for all phases of LPC life cycle. Improve forage production quantity and/or quality. Facilitate distribution of grazing to target the maintenance or creation of desired LPC habitat. Restore and/or maintain ecological sites.

Practice Application: This practice will be implemented on up to 66,000 acres of land per year throughout the Action Area as indicated in the table below. This practice is typically applied in spring on a 3-10 year interval as determined by ecological and wildlife habitat evaluations (see Appendix II). Prescribed burning will be used within the LPCI to address specific on-site concerns such as producing a vegetative response and structural development that will increase available habitat in combination with prescribed grazing. Further, prescribed burning shall be limited to sites specifically identified with prescribed grazing or wildlife habitat objective(s) to be reached by using this practice.

338 Prescribed Burning anticipated average usage

State	Juniper ac/yr	Shinnery Oak ac/yr	Sagebrush ac/yr	Mequite/Cactus ac/yr	Applied During Breed/Nesting Season ac/yr	Total ac/yr
Colorado	0500	0	02,000			2,500
Kansas	35,000		7,000		39,900	42,000
Oklahoma	10,200	1,200	3,0003,600	0	11,250	15,000

Texas	300	0	350	1,200		1,850
New Mexico						0

Resource Concerns: Lack of prescribed burning activities results in ecological sites which are vastly different from historic plant communities for LPC and grazing by large ungulates such as livestock. Plant productivity, health, and vigor have been reduced due to a lack of fire. Increased fire return intervals have created a plant community less responsive to prescribed fire and have allowed for invasion of undesirable species such as Eastern Red Cedar and non-native grass species.

Potential beneficial effect(s) to LPC: With the use of prescribed burning plant communities can be altered to create brood-rearing habitat, increasing forbs and legumes while improving insect populations and succulent forbs needed by LPC in early life stages. Prescribed burning is also important in maintaining or restoring plant communities as described in ecological site descriptions. Prescribed burning can be used to manipulate grazing activities for the purpose of restoring, creating, or manipulating plant communities to meet the LPC habitat needs. Target areas and defined objective(s) will be clearly stated with intended goals to be addressed for each client defined management unit.

Potential Adverse Effect(s) to LPC: Accidental injury or mortality of nesting hens, eggs, or brood may occur if the burn is conducted during the nesting or brood-rearing seasons. In addition, a temporary reduction of cover for LPC may occur for one to three years.

Conservation Measures:
NRCS shall coordinate with the affected State Fish and Wildlife Agency and confer with the State Technical Committees to identify appropriate restrictions on the placement, extent, configuration, and timing of this conservation practice standard and the area where these practice restrictions would apply so as to avoid or minimize adverse effects to the LPC and supporting habitat conditions.

This practice standard will be designed to support other practices which will create the desired habitat conditions for the LPC as recommended by affected State Fish and Wildlife Agency. Defer implementation of this conservation practice within 1/2 mile to known leks until all breeding and nesting activities are completed, typically March 1 through July 15, or as modified by State Fish and Wildlife Agency or State Technical Committee recommendations. If a modification of the restrictions on the timing of this conservation practice could increase the likelihood or extend to adverse effects, these modifications need to be further coordinated with the Service's local Field Office.

Conservation Practice Standards – Vegetative Practices

Conservation Practice Standard: Brush Management (314) (FACILITATING VEGETATIVE PRACTICE)

Definition: The management or removal of woody (non-herbaceous or succulent) plants including those that are invasive and noxious.

Purpose: To restore or enhance the desired native plant community which is consistent with the ecological site description, and which provides the most suitable habitat for the LPC and other wildlife species. Specifically, it may be used for the purpose of:

- Removing undesirable post-settlement conifers such as juniper, Eastern red cedar or deciduous species such as mesquite and black locust which have encroached into habitats being restored for LPC habitat.
- Improving the diversity of habitat to create a mosaic of irregular shaped grassland openings based on LPC home range, or to provide a release to allow for the native grass and forb community to be expressed.

Practice Application: This practice will be applied as needed on up to 53,000 acres of land per year throughout the Action Area (see table for acres treated by brush species). The practice is implemented by manual or mechanical means, such as: chainsaws, feller bunchers, hydrologic sheers, or masticators. Cut brush may be lopped-and-scattered, piled-and-burned, chipped, or hauled off. Brush will be felled unless other considerations necessitate leaving them standing, or dragging an anchor chain across the site (chaining). This practice is typically done on stands in later succession stages of encroachment where sagebrush and other native shrubs, grasses, and forbs are greatly reduced or absent, or herbicide application. When herbicides are applied for suppression of shinnery oak and sand sage, rates will be determined by desired ecological state for the LPC.

314 Brush Management anticipated average usage

State	Juniper ac/yr	Shinnery Oak ac/yr	Sagebrush ac/yr	Mesquite ac/yr	Applied During B/N Season ac/yr	Total ac/yr
Colorado	2,587		2,588			5,175
Kansas	2,675				1,500	2,675
Oklahoma	23,080	2,000	750	0	9,000	25,830
Texas	18,300	3,500	3,500			25,300
New Mexico		5,500		24.856		30,356

Resource concerns: Habitat fragmentation and loss of suitable habitat for the LPC.

Potential beneficial effect(s) to LPC: Removal of limiting habitat factor and creation of desired or targeted habitat conditions as recommended by the affected State Fish and Wildlife Agency.

Potential adverse effect(s) to LPC: Short-term effects may result from visual and physical disturbance (including noise) during implementation. Temporary soil and vegetation disturbances resulting from implementation and increased potential for invasive plants on disturbed areas. Increased fire hazard from equipment during implementation, or if slash remains on-site. There might be an increased potential for soil erosion, accidental mortality during implementation, and potential for damage to non-target shrub species during implementation.

Conservation Measures:
NRCS shall coordinate with the affected State Fish and Wildlife Agency and confer with the State Technical Committees to identify appropriate restrictions on the placement, extent, configuration, and timing of this conservation practice standard and the area where these practice restrictions would apply so as to avoid or minimize adverse effects to the LPC and supporting habitat conditions.

This practice standard will be designed to support other practices which will create the desired habitat conditions for the LPC as recommended by the affected State Fish and Wildlife Agency. Defer implementation of this conservation practice within 1/2 mile to known leks until all breeding and nesting activities are completed, typically March 1 through July 15, or as modified by State Fish and Wildlife Agency or State Technical Committee recommendations. If a modification of the restrictions on the timing of this conservation practice could increase the likelihood or extend to adverse effects, these modifications need to be further coordinated with the Service's local Field Office.

Minimize soil and vegetative disturbances during installation of conservation practices. Avoid disturbing the soil on sensitive areas with a high potential for soil erosion.

On disturbed areas, use site specific reclamation strategies developed using ecological site descriptions with consideration to LPC habitat needs.

Use the conservation measures provided for the facilitative practice of Critical Area Planting (342) in areas where reseeding disturbed areas is needed.

Regularly monitor the site after implementation to ensure erosion and weed issues are addressed quickly.

Evaluate the site's potential for soil erosion and invasion by undesirable plants during practice planning and design.

The practice will be designed to minimize or avoid unintentional damage to non-target plants. The implementation plan shall clearly identify any special resources that need to be avoided; such as riparian areas, wetlands/playas, leks, or habitat of other at-risk species.

Large brush (>5 ft.) will be felled unless other considerations necessitate leaving them standing.

Woody slash shall be treated if significant buildup of fuels occurs. Slash piles shall be burned when wildfire risk is low (usually when soils are frozen or saturated). Follow state forestry laws, when applicable, for treating slash to minimize wildfire risk.

Treated sites may be deferred from livestock grazing for a period of time determined to be adequate based on pre and post site conditions (i.e. brush densities, potential for erosion, potential for plant community to improve in health, vigor and cover). NRCS with input from the State Technical Committee and the affected State Fish and Wildlife Agency will identify appropriate deferment periods.

This practice does not apply to removal of woody vegetation to facilitate a land use change.

Conservation Practice Standard: Firebreak (394) (FACILITATING, VEGETATIVE PRACTICE)

Definition: A permanent or temporary strip of bare or vegetated land planned to retard fire.

Purpose: Reduce the spread of wildfire and contain prescribed burns to their targeted area.

Practice Application: This practice will be implemented on up to 85 acres or approximately 29 miles (12-24 feet wide strips typically exterior property lines or along fence lines) of land per year throughout the Action Area as needed based on the Prescribed Burn plan. This practice is typically completed in the fall prior to or immediately prior to a spring burn. Firebreak site preparation may include the use of tillage and/or mowing and/or vegetative techniques.

394 Firebreak anticipated average usage

State	Total ac/yr
Colorado	10
Kansas	10
Oklahoma	75
Texas	45
New Mexico	0

Resource Concerns: The primary concerns that a firebreak addresses are the spread of fire beyond the targeted prescribed burn area and the spread of wildfires, resulting in large-scale, temporary alteration of the landscape, including unintended harm to LPCs that may occur in the burn area

Potential beneficial effect(s) to LPC: Practice can help reduce the spread of wildfires thus reducing the risk of large-scale, habitat loss. Firebreaks can provide a food source for LPC by stimulating annual forb growth.

Potential Adverse Effects(s) to LPC: Short-term physical disturbances, such as disking or mowing, may cause LPC to leave the area temporarily. Disked or mowed firebreaks disturb soil and vegetation and result in a temporary reduction of cover over a small area. Soil disturbance may also allow invasive plants to grow and alter the community structure.

Conservation Measures:
Defer implementation of this conservation practice within 1/2 mile to known leks until all breeding and nesting activities are completed, typically March 1 through July 15, or as modified by State Fish and Wildlife Agency or State Technical Committee recommendations. If a modification of the restrictions on the timing of this conservation practice could increase the likelihood or extend to adverse effects, these modifications need to be further coordinated with the Service's local Field Office.

Disked firebreaks will be allowed to re-establish or be seeded to beneficial grasses, forbs and legumes to provide bugging or brood rearing habitat.

State-listed noxious and invasive plants will be identified and controlled following firebreak installation.

Firebreaks will only be installed as part of a grazing management or wildlife habitat plan. Operate machinery in a manner that allows wildlife to flush and escape by methods such as starting operations in the middle of field and working outward, and/or by modify equipment with flush bar attachments.

Conservation Practice Standard: Cover Crop (340) (FACILITATING VEGETATIVE PRACTICE)

Definition: Crops including grasses, legumes, and forbs for seasonal cover and other conservation purposes.

Purpose: This practice will reduce soil erosion from wind and water, increase soil organic matter content, capture and recycle or redistribute nutrients in the soil profile, promote biological nitrogen fixation, increase biodiversity, weed suppression, provide supplemental forage, soil moisture management, reduce particulate emissions into the atmosphere, minimize and reduce soil compaction. Cover crops are typically used to provide ground cover until the permanent vegetation can be established when converting cropland to grass.

Practice Application: Use of a tractor and mechanical means to plant seeds. This practice will be implemented on up to 9,000 acres of land per year throughout the Action Area.

340 Cover Crop anticipated average usage

State	Native ac/yr	Introduced Grass ac/yr	Alfalfa ac/yr	Applied During B/N Season	Total ac/yr

				ac/yr	
Colorado	2,000	500			2,500
Kansas	3,750			3,000	3,750
Oklahoma	2,250	250	0	0	2,500
Texas					1,500
New Mexico	2,000				2,000

Resource concerns: The primary resource concerns addressed with the LPCI are wind and water erosion between harvesting of the crop and planting of the native grass. Limited LPC brood rearing habitat between site preparation and full establishment can reduce brood survival.

Potential beneficial effect(s) to LPC: Multi-species cover crops planted on cropland adjacent to LPC nesting habitat for a full growing season or planted after small grain harvest can create and improve brood-rearing habitat. Cover crops planted until permanent vegetation is established can provide stability in the ecosystem by improving soil quality, preventing erosion and providing limited cover for birds.

Potential Adverse Effect(s) to LPC: Short-term and occasional physical disturbance (including noise); temporary soil and vegetation disturbances; increased potential for invasive plants.

Conservation Measures:
NRCS shall coordinate with the affected State Fish and Wildlife Agency and confer with the State Technical Committees to identify appropriate restrictions on the placement, extent, configuration, and timing of this conservation practice standard and the area where these practice restrictions would apply so as to avoid or minimize adverse effects to the LPC and supporting habitat conditions.

Defer implementation of this conservation practice within 1/2 mile to known leks until all breeding and nesting activities are completed, typically March 1 through July 15, or as modified by State Fish and Wildlife Agency or State Technical Committee recommendations. If a modification of the restrictions on the timing of this conservation practice could increase the likelihood or extend to adverse effects, these modifications need to be further coordinated with the Service's local Field Office. When implementing this practice on cropland for the purpose of establishing perennial vegetation a number of activities, primarily planting, will need to take place during the primary breeding and nesting season. In these situations an effort shall be taken to complete activities with as little disturbance as possible to adjacent and surrounding existing LPC habitat.

Evaluate the site's potential for soil erosion. Minimize soil and vegetative disturbances during installation of conservation practices. During installation, utilize soil erosion protection measures if potential for off-site soil erosion exists.

Monitor, evaluate and control State listed invasive and noxious plants during practice planning and design.

Machinery associated with the practice should be clean and free of vegetative debris prior to use to prevent the spread of invasive plant species.

Where practicable use of more than one cover crop species will provide greater benefit to LPC.

Conservation Practice Standard: Critical Area Planting (342) (FACILITATING VEGETATIVE PRACTICE)

Definition: Establishing permanent vegetation on sites that have, or are expected to have, high erosion rates, and on sites that have physical, chemical or biological conditions that prevent the establishment of vegetation with normal practices.

Purpose: This practice is applied as needed in order to stabilize erosion by the establishment of native and/or non-invasive vegetation in areas with disturbed soil from installation of other practices, such as grade stabilization structures or from long-term damage caused by oil and gas activities.

Practice Application: Use of a tractor and mechanical means to plant seeds. This practice will be implemented on up to 160 acres of land per year throughout the Action Area.

342 Critical Area Planting anticipated average usage

State	Applied During B/N Season ac/yr	Total ac/yr
Colorado		60
Kansas	70	100
Oklahoma	30	30
Texas		0
New Mexico		0

Resource concerns: Un-vegetated, disturbed soil creates sites for invasive plant species to colonize, promotes increased soil erosion, and reduces wildlife habitat quality.

Potential Beneficial Effect(s) to LPC: Establishment of permanent vegetation can provide stability in the ecosystem by improving soil quality, preventing erosion and providing limited cover for birds.

Potential Adverse Effect(s) to LPC: Short-term and occasional physical disturbance (including noise); temporary soil and vegetation disturbances; increased potential for invasive plants.

Conservation Measures:
NRCS shall coordinate with the affected State Fish and Wildlife Agency and confer with the State Technical Committees to identify appropriate restrictions on the placement, extent, configuration, and timing of this conservation practice standard and the area where these practice restrictions would apply so as to avoid or minimize adverse effects to the LPC and supporting habitat conditions.

Defer implementation of this conservation practice within 1/2 mile to known leks until all breeding and nesting activities are completed, typically March 1 through July 15, or as modified by State Fish and Wildlife Agency or State Technical Committee recommendations. If a modification of the restrictions on the timing of this conservation practice could increase the likelihood or extend to adverse effects, these modifications need to be further coordinated with the Service's local Field Office.

Evaluate the site's potential for soil erosion. Minimize soil and vegetative disturbances during installation of conservation practices. During installation, utilize soil erosion protection measures if potential for off-site soil erosion exists.

Use site specific reclamation strategies developed using ecological site descriptions. Native species will be used whenever possible to meet practice objectives with preference to forbs, grasses and grass-like plants preferred by the LPC as well as those plants that reflect the potential of the specific ecological site to optimize LPC habitat needs. Seed mixes should be State-certified, meeting the appropriate State certification criteria as being free of state declared noxious and invasive vegetative material.

Monitor, evaluate and control State listed invasive and noxious plants during practice planning and design.

Machinery associated with the practice should be clean and free of vegetative debris prior to use to prevent the spread of invasive plant species.

Timing of planting and post-establishment vegetation management will be designed as per local site conditions to meet NRCS practice specifications.

Regularly monitor the site after implementation to ensure erosion and weed issues are addressed quickly.

Conservation Practice Standard: Forage and Biomass Planting (512) (FACILITATING VEGETATIVE PRACTICE)

Definition: Establishing adapted and/or compatible species, varieties, or cultivars of herbaceous species suitable for pasture, hay, or biomass production.

Purpose: This practice may be applied as needed to improve or maintain livestock nutrition and health, to provide or increase forage supply during periods of low forage production, to reduce soil erosion, improve soil and water quality, and to produce feedstock for bio-fuel or energy production. Within the Action Area, this practice is typically used to convert croplands to perennial grass and legume mixtures to increase forage hay production and grazing for livestock. More recently, some plantings have been established for the purpose of producing and harvesting biomass for fuels and energy.

Practice Application: Use of a tractor and mechanical means to plant forage and biomass. This practice will be implemented on up to 3,200 acres of land per year throughout the Action Area. Average field size of plantings under this practice is less than 160 acres. Forage and biomass plantings in the Action Area primarily consist of warm season grass plantings that are established February through June. Some cool season grasses are planted under this practice such as wheatgrass, ryegrass, and brome grass from August through September. As indicated above, most of the plantings occur on old cropland fields that require only limited amounts of site preparation before plantings are made.

512 Forage and Biomass Planting anticipated average usage

State	Native Grass ac/yr	Introduced Grass ac/yr	Alfalfa ac/yr	Total ac/yr	Applied During B/N Season ac/yr
Colorado		500	150	650	
Kansas				0	
Oklahoma	1,500	1,000	0	2,500	1,000
Texas				0	
New Mexico				0	

Resource Concerns: This practice is most commonly used to convert cropland fields to permanent vegetative cover to prevent soil loss, improve soil conditions, improve wildlife cover, and improve water quality and quantity. This practice also address needs for adequate food for livestock and within the LPCI will provide adequate food for the LPC.

Potential Beneficial Effect(s) to LPC: Many of these plantings can provide good quality nesting and brood-rearing habitat if haying and grazing are properly managed. The corresponding increase in available forage for livestock can also remove grazing pressure on existing native rangelands and lead to improved range condition.

Potential Adverse Effect(s) to LPC: Short-term adverse impacts may result from installing the practice during reproductive and nesting periods. However, this practice is typically implemented on cropland fields with limited prior value to LPC, so disturbance impacts would be minimal.

Conservation Measures:
NRCS shall coordinate with the affected State Fish and Wildlife Agency and confer with the State Technical Committees to identify appropriate restrictions on the placement, extent, configuration, and timing of this conservation practice standard and the area where these practice restrictions would apply so as to avoid or minimize adverse effects to the LPC and supporting habitat conditions.

Defer implementation of this conservation practice within 1/2 mile to known leks until all breeding and nesting activities are completed, typically March 1 through July 15, or as modified by State Fish and Wildlife Agency or State Technical Committee recommendations. If a modification of the restrictions on the timing of this conservation practice could increase the likelihood or extend to adverse effects, these modifications need to be further coordinated with the Service's local Field Office. When implementing this practice on cropland for the purpose of establishing perennial vegetation a number of activities, primarily planting, will need to take place during the primary breeding and nesting season. In these situations an effort shall be taken to complete activities with as little disturbance as possible to adjacent and surrounding existing LPC habitat.

Use site specific reclamation strategies developed using ecological site descriptions. Native species will be used whenever possible to meet practice objectives with preference to forbs, grasses and grass-like plants preferred by the LPC as well as those plants that reflect the potential of the specific ecological site to optimize LPC habitat needs. Seed mixes should be State-certified, meeting the appropriate State certification criteria as being free of state declared noxious and invasive vegetative material.

Timing of planting and post-establishment vegetation management will be designed as per local site conditions to meet NRCS practice specifications and NRCS biologist or State Fish and Wildlife Agency recommendations.

Monitor, evaluate and control State listed invasive and noxious plants during practice planning and design.

Machinery associated with the practice should be clean and free of vegetative debris prior to use to prevent the spread of invasive plant species.

Operate machinery in a manner that allows wildlife to flush and escape by methods such as starting operations in the middle of field and working outward, and/or by modify equipment with flush bar attachments.

Control livestock access as needed to allow for initial establishment of new vegetative plantings and control weeds through flash grazing.

Conservation Practice Standard: Range Planting (550) (FACILITATING VEGETATION PRACTICE)

Definition: Establishment of adapted perennial or self-sustaining vegetation such as grasses, forbs, legumes, shrubs and trees.

Purpose: Applied to restore the native plant community to a condition similar to the ecological site description reference state for the site, provide or improve forages for livestock and browse or cover for wildlife, reduce erosion by wind and/or water, improve water quality and quantity, and increase carbon sequestration. This practice is used to restore important native habitats by converting cropland to grasslands, to meet habitat requirements for LPC.

Practice Application: Use of a tractor and mechanical means to plant permanent native vegetation. This practice will be implemented on up to 12,000 acres of land per year throughout the Action Area.

550 Range Planting anticipated average usage

State	Native Grass ac/yr	Applied During B/N Season ac/yr	Total ac/yr
Colorado	2,000	1,000	2,000
Kansas	5,000	4,000	5,000
Oklahoma	2,500	1,750	2,500
Texas	1,750		2,500
New Mexico	2,000		2,000

Resource concerns: This practice is most commonly used to convert cropland fields to permanent vegetative cover to prevent soil loss, improve soil conditions, and improve water

quality and quantity and create habitat for LPC. Cropland sites typically provide inadequate food and cover for LPC and other grassland species.

Potential Beneficial Effect(s) to LPC: Practice increases habitat quality for LPC and restores diverse, permanent, native plant communities.

Potential Adverse Effect(s) to LPC: Short-term and occasional physical disturbance (including noise); temporary soil and vegetation disturbances; increased potential for invasive plants.

Conservation Measures:
NRCS shall coordinate with the affected State Fish and Wildlife Agency and confer with the State Technical Committees to identify appropriate restrictions on the placement, extent, configuration, and timing of this conservation practice standard and the area where these practice restrictions would apply so as to avoid or minimize adverse effects to the LPC and supporting habitat conditions.

Defer implementation of this conservation practice within 1/2 mile to known leks until all breeding and nesting activities are completed, typically March 1 through July 15, or as modified by State Fish and Wildlife Agency or State Technical Committee recommendations. If a modification of the restrictions on the timing of this conservation practice could increase the likelihood or extend to adverse effects, these modifications need to be further coordinated with the Service's local Field Office. When implementing this practice on cropland for the purpose of establishing perennial vegetation a number of activities, primarily planting, will need to take place during the primary breeding and nesting season. In these situations an effort shall be taken to complete activities with as little disturbance as possible to adjacent and surrounding existing LPC habitat.

When converting existing vegetation to an improved cover there will likely be a need for activities to take place during the primary nesting season. In these situations individual on-site determinations will be needed to plan the best course of action. Initial preparations such as mowing or burning may need to be completed prior to the nesting/leking season to eliminate potential activity in the area to be seeded. If there are situations where avoidance is not fully possible consultation may be necessary.

Evaluate the site's potential for soil erosion and invasion by undesirable plants during practice planning and design. Minimize soil and vegetative disturbances during installation of conservation practices. Utilize soil erosion protection measures, if potential for soil erosion exists (silt fences etc.).

Use site specific reclamation strategies developed using ecological site descriptions. Native species will be used whenever possible to meet practice objectives with preference to forbs, grasses and grass-like plants preferred by the LPC as well as those plants that reflect the potential of the specific ecological site to optimize LPC habitat needs. Seed mixes should be State-certified, meeting the appropriate State certification criteria as being free of state declared noxious and invasive vegetative material.

Timing of planting and post-establishment vegetation management will be designed as per local site conditions to meet NRCS practice specifications and NRCS biologist or State Fish and Wildlife Agency recommendations.

Monitor, evaluate and control State listed invasive and noxious plants during practice planning and design.

Machinery associated with the practice should be clean and free of vegetative debris prior to use to prevent the spread of invasive plant species.

Control livestock access as needed to allow for initial establishment of new vegetative plantings and control weeds through flash grazing.

Conservation Practice Standard: Herbaceous Weed Control (315) (FACILITATING VEGETATIVE PRACTICE)

Definition: The removal or control of herbaceous weeds including invasive, noxious and prohibited plants.

Purpose: This practice may be applied to control or remove invasive and noxious weeds through chemical, biological, or mechanical means in order to restore native or desired plant communities and habitat for LPC consistent with the ecological site description. It secondarily protects soils, controls erosion, reduces fine-fuels fire hazards, and improves air quality.

Practice Application: Specifically, this practice may be applied to control or remove invasive and noxious weeds through chemical, biological, or mechanical means in order to restore native or desired plant communities and habitat for LPC consistent with the ecological site. NRCS may apply up to 12,100 acres of herbaceous weed control annually in Action Area. This practice is applied during the growing season which will vary depending on species and method of control. For chemical applications, a tractor or ATV with a sprayer is typical. Mechanical application normally requires using a tractor and mower or disk. Biological application in LPC habitat will be limited to grazing animals at the best time of year to control the targeted weeds.

315 Herbaceous Weed Control anticipated average usage

State	ac/yr
Colorado	2,500
Kansas	2,100
Oklahoma	5,000
Texas	1500
New Mexico	0

Resource concerns: Invasive and noxious weeds degrade ecological sites by increasing competition with native and desirable plant species. This results in decreased sustainability and resiliency of the ecological sites and leads to reduced habitat quality and quantity for wildlife, including LPC.

Potential Beneficial Effect(s) to LPC: Practice implementation removes or reduces invasive or other weed species that directly or indirectly limit LPC habitat quality and productivity. Practice can beneficially influence the vigor and establishment of native or desirable vegetation required to provide LPC habitat.

Potential Adverse Effect(s) to LPC: Temporary physical disturbance (including noise), soil and vegetation disturbance and increased potential for invasive plants. Destruction of nesting habitat and loss of nests and/or young when mechanical treatment coincides with nesting season. Temporary reduction of forage and prey availability for young birds.

Conservation measures:
NRCS shall coordinate with the affected State Fish and Wildlife Agency and confer with the State Technical Committees to identify appropriate restrictions on the placement, extent, configuration, and timing of this conservation practice standard and the area where these practice restrictions would apply so as to avoid or minimize adverse effects to the LPC and supporting habitat conditions.

Defer implementation of this conservation practice within 1/2 mile to known leks until all breeding and nesting activities are completed, typically March 1 through July 15, or as modified by State Fish and Wildlife Agency or State Technical Committee recommendations. If a modification of the restrictions on the timing of this conservation practice could increase the likelihood or extend to adverse effects, these modifications need to be further coordinated with the Service's local Field Office. Spot treatment should be utilized where practicable.

Use site specific reclamation strategies developed using ecological site descriptions. Native species will be used whenever possible to meet practice objectives with preference to forbs, grasses and grass-like plants preferred by the LPC as well as those plants that reflect the potential of the specific ecological site to optimize LPC habitat needs. Seed mixes should be State-certified, meeting the appropriate State certification criteria as being free of state declared noxious and invasive vegetative material.

Monitor, evaluate and control State listed invasive and noxious plants during practice planning and design.

Machinery associated with the practice should be clean and free of vegetative debris prior to use to prevent the spread of invasive plant species.

Use the conservation measures provided for the facilitative practice of Critical Area Planting (342) in areas where reseeding disturbed areas is needed.

Operate machinery in a manner that allows wildlife to flush and escape by methods such as starting operations in the middle of field and working outward, and/or by modify equipment with flush bar attachments.

Conservation Practice Standard: TREE/SHRUB ESTABLISHMENT (612) (FACILITATING VEGETATIVE PRACTICE)

Definition: Establishing woody plants by planting seedlings or cuttings, direct seeding, or natural regeneration.

Purpose: To restore or enhance the desired native shrub community that is consistent with the ecological site description and as recommended by the affected State Fish and Wildlife Agency that identifies the most suitable habitat for the LPC and other wildlife species. Specifically, CPS 612 may be used for the purpose of:

1) Providing vertical and thermal cover.
2) Improving the diversity of habitat to create a wider suite of food options that are available throughout the LPC's life cycle.
3) Increasing food availability during heavy snow events.

Practice Application: The following practice application guidelines shall pertain only to CPS 612 implementation through LPCI contracts within the LPC Action Area. The practice is implemented by:
1) Planting scattered plots of native shrub species that are beneficial to LPC as determined by the affected State Fish and Wildlife Agency. Shrub species will be planted using manual or mechanical means including: tree planters, hand planting, or seeding.
2) Plots will be designed to avoid creating linear features that can function as predator corridors.
3) The length of a plot should be no more than twice the width.
4) Individual plots will be up to one acre in size, at least 500 feet apart, and involve a maximum of 5 percent of the LPCI contracted acres within each state.
5) A plot is defined as the area encompassing a localized planting of shrub species either as thickets, clumps, or individual plantings. In the presence oflivestock, only the area from which livestock have been excluded by a perimeter fence will be considered to be a portion of the plot.

612 Tree and Shrub establishment anticipated average usage

State	Total ac/yr
Colorado	50
Kansas	10
Oklahoma	0
Texas	25
New Mexico	0

Resource concerns: Wildlife habitat, specifically increased over-winter food, vegetative structure, and thermal cover for LPC.

Potential beneficial effect(s) to LPC: While implementation of this practice may cause limited short term adverse impacts, the long term benefits achieved will far exceed any short term detriments associated with this practice. The practice will ameliorate a limiting habitat factor and create desired or targeted habitat conditions as recommended by the affected State Fish and Wildlife Agency. Benefits include increased availability of food during heavy snowfall events, diversity of cover beneficial for thermal regulation in winter and summer, and enhanced pollinator habitat, which will increase available food potential for broods.

Potential adverse effect(s) to LPC: Short-term effects may result from visual and physical disturbance (including noise) during implementation. Temporary soil and vegetation disturbances resulting from implementation and increased potential for invasive plants on disturbed areas. There might be an increased potential for soil erosion or accidental mortality during implementation, especially from overland vehicle travel.

Conservation Measures:
The following conservation measures shall apply to ALL CPS 612 shrub planting implemented within the LPC Action Area, without regard to participation in an LPCI contract:

NRCS shall coordinate with the affected State Fish and Wildlife Agency and confer with the State Technical Committees to identify appropriate restrictions on the placement, extent, configuration, and timing of shrub planting under this conservation practice standard and the area where these practice restrictions would apply so as to avoid or minimize adverse effects to the LPC and supporting habitat conditions.

This practice standard will be designed to support other practices that will create the desired habitat conditions for the LPC as recommended by the affected State Fish and Wildlife Agency.

Defer site preparation for this conservation practice within 1/2 mile to known leks until all breeding and nesting activities are completed, typically March 1 through July 15, or as modified by State Fish and Wildlife Agency or State Technical Committee recommendations. If a modification of the restrictions on the timing of this conservation practice could increase the likelihood or extend to adverse effects, these modifications need to be further coordinated with the Service's local Field Office. Minimize soil and vegetative disturbances during installation of conservation practices. Avoid disturbing the soil on sensitive areas with a high potential for soil erosion.

Evaluate and minimize the site's potential for soil erosion and invasion by undesirable plants during practice planning and design.

Regularly monitor the site after implementation to ensure erosion and undesirable plant issues are addressed quickly.
Machinery associated with the practice should be clean and free of vegetative debris prior to use to prevent the spread of invasive plant species.

The implementation plan shall clearly identify any special resources that need to be avoided; such as riparian areas, wetlands/playas, leks, or habitat of other at-risk species.

When livestock are present, plots must be deferred from livestock grazing for a period of time determined to be adequate based on recommendations in the 612 Standard and Specification. (See also the plot definition in Practice Application guidelines for participants in LPCI contracts.)

Species planted must be ecologically appropriate, arranged to minimize predator impacts, and beneficial to LPC. For LPCI, plot locations should not be in close proximity to permanent vertical structures when possible. There may be circumstances when locating plots next to certain vertical structures will provide LPC habitat benefits which offset the negative effects associated with the vertical structure.

Within the LPC Action Area, all practice 612 shrub plantings shall be completed in coordination with the local biologist (Service, NRCS, Joint Farm Bill Biologists, or State Wildlife Agency) who will sign off on the planting as either providing LPC habitat (LPCI requirement) or not negatively impacting LPCs.

Conservation Practice Standard: Woody Residue Treatment (384) (FACILITATING VEGETATIVE PRACTICE)

Definition: The treatment of residual woody material that is created due to management activities or natural disturbances.

Purpose: improve access to forage for livestock and wildlife

Practice Application: On all lands, except active cropland, where woody residue requires treatment.
This practice will be utilized as a follow up practice to 314 Brush Management or following a prescribed or wild fire event. The most common species to be treated with 384 will be Mesquite and Eastern Red Cedar although other species may necessitate treatment also dependent upon local site conditions.

384 Woody Residue Treatment anticipated average usage

State	acres/yr
Colorado	2,000
Kansas	
Oklahoma	
Texas	
New Mexico	

Resource concerns: The standing dead carcasses of woody species remaining after chemical, fire, or other control methods continue to present a barrier to LPC area use. These carcasses

present roost areas for predator species, visual obstructions, and flight obstructions. It is important these carcasses are removed to provide an opportunity for LPC to recolonize acres where brush management has been completed. Treatments must be accomplished by methods allowing for the safe and proper removal of residue carcasses.

Potential beneficial effect(s) to LPC: Use of this practice in conjunction with and as a supporting practice for 314 Brush Management will allow for the opportunity for LPC to recolonize acres where tall woody vegetation has presented a habitat concern for LPC. Proper removal will allow herbaceous vegetation to quickly recover providing habitat for LPC and grazing for livestock.

Potential adverse effect(s) to LPC: bShort-term and occasional physical disturbance (including noise) and temporary soil and vegetation disturbance during implementation. There could also be an increased potential for invasive plants in the disturbed soil post installation. Direct mortality can occur due to removal methods and decreased vegetative cover in the time period immediately following implementation.

Conservation Measures:
NRCS shall coordinate with the affected State Fish and Wildlife Agency and confer with the State Technical Committees to identify appropriate restrictions on the placement, extent, configuration, and timing of this conservation practice standard and the area where these practice restrictions would apply so as to avoid or minimize adverse effects to the LPC and supporting habitat conditions.

Defer implementation of this conservation practice within 1/2 mile to known leks until all breeding and nesting activities are completed, typically March 1 through July 15, or as modified by State Fish and Wildlife Agency or State Technical Committee recommendations. If a modification of the restrictions on the timing of this conservation practice could increase the likelihood or extend to adverse effects, these modifications need to be further coordinated with the Service's local Field Office.

Evaluate the site's potential for soil erosion and invasion by undesirable plants during practice planning and design. Minimize soil and vegetative disturbances during installation of conservation practices. Utilize soil erosion protection measures, if potential for soil erosion exists (silt fences etc.).

Consider air quality regulations, state and local burning regulations, and safety if utilizing prescribed burning as a treatment.

Design conservation practice to minimize or avoid loss of shrubs during practice installation. If access for operation and maintenance is required, limit access to one side of disturbance and limit access to one vehicle width.

Use site specific reclamation strategies developed using ecological site descriptions. Native species will be used whenever possible to meet practice objectives with preference to forbs, grasses and grass-like plants preferred by the LPC as well as those plants that reflect the potential

of the specific ecological site to optimize LPC habitat needs. Seed mixes should be State-certified, meeting the appropriate State certification criteria as being free of state declared noxious and invasive vegetative material.

Monitor, evaluate and control State listed invasive and noxious plants during practice planning and design.

Machinery associated with the practice should be clean and free of vegetative debris prior to use to prevent the spread of invasive plant species.

Timing of planting and post-establishment vegetation management will be designed as per local site conditions to meet NRCS practice specifications.

Regularly monitor the site after implementation to ensure erosion and weed issues are addressed quickly.

Limit duration of construction period to the minimum practicable.

Conservation Practice Standard: Conservation Cover (327) (FACILITATING VEGETATION PRACTICE)

Definition: Establishing and maintaining permanent vegetative cover.

Purpose: This practice shall be applied to reduce soil erosion and sedimentation, improve water quality, improve air quality, enhance wildlife habitat and pollinator habitat, improve soil quality, and manage plant pests. Special considerations will be given to planting species mixes that will provide LPC habitat requirements.

Practice Application: Use of a tractor and mechanical means to plant permanent native vegetation.

327 Conservation Cover anticipated average usage

State	Native Grass ac/yr	Total ac/yr
Colorado		
Kansas		
Oklahoma		
Texas		7,500
New Mexico		

Resource concerns: This practice is most commonly used to convert cropland fields to permanent vegetative cover to prevent soil loss, improve soil conditions, and improve water

quality and quantity and create habitat for LPC. Cropland sites typically provide inadequate food and cover for LPC and other grassland species.

Potential Beneficial Effect(s) to LPC: Practice increases habitat quality for LPC and restores diverse, permanent, native plant communities.

Potential Adverse Effect(s) to LPC: Short-term and occasional physical disturbance (including noise); temporary soil and vegetation disturbances; increased potential for invasive plants.

Conservation Measures:
NRCS shall coordinate with the affected State Fish and Wildlife Agency and confer with the State Technical Committees to identify appropriate restrictions on the placement, extent, configuration, and timing of this conservation practice standard and the area where these practice restrictions would apply so as to avoid or minimize adverse effects to the LPC and supporting habitat conditions.

Defer implementation of this conservation practice within 1/2 mile to known leks until all breeding and nesting activities are completed, typically March 1 through July 15, or as modified by State Fish and Wildlife Agency or State Technical Committee recommendations. If a modification of the restrictions on the timing of this conservation practice could increase the likelihood or extend to adverse effects, these modifications need to be further coordinated with the Service's local Field Office.

When implementing this practice on cropland for the purpose of establishing perennial vegetation a number of activities, primarily planting, will need to take place during the primary breeding and nesting season. In these situations an effort shall be taken to complete activities with as little disturbance as possible to adjacent and surrounding existing LPC habitat.

When converting existing vegetation to an improved cover there will likely be a need for activities to take place during the primary nesting season. In these situations individual on-site determinations will be needed to plan the best course of action. Initial preparations such as mowing or burning may need to be completed prior to the nesting/leking season to eliminate potential activity in the area to be seeded. If there are situations where avoidance is not fully possible consultation may be necessary.

Evaluate the site's potential for soil erosion and invasion by undesirable plants during practice planning and design. Minimize soil and vegetative disturbances during installation of conservation practices. Utilize soil erosion protection measures, if potential for soil erosion exists (silt fences etc.).

Use site specific reclamation strategies developed using ecological site descriptions. Native species will be used whenever possible to meet practice objectives with preference to forbs, grasses and grass-like plants preferred by the LPC as well as those plants that reflect the potential of the specific ecological site to optimize LPC habitat needs. Seed mixes should be State-certified, meeting the appropriate State certification criteria as being free of state declared noxious and invasive vegetative material.

Timing of planting and post-establishment vegetation management will be designed as per local site conditions to meet NRCS practice specifications and NRCS biologist or State Fish and Wildlife Agency recommendations.
Monitor, evaluate and control State listed invasive and noxious plants during practice planning and design.

Machinery associated with the practice should be clean and free of vegetative debris prior to use to prevent the spread of invasive plant species.

Control livestock access as needed to allow for initial establishment of new vegetative plantings and control weeds through flash grazing.

Conservation Practice Standards – Facilitating Structural Practices

Conservation Practice Standard: Watering Facility (614) (FACILITATING STRUCTURAL PRACTICE)

Definition: A permanent or portable device to provide an adequate amount and quality of drinking water for livestock and or wildlife.

Purpose: To provide access to drinking water for livestock and/or wildlife in order to meet daily water requirements and improve animal distribution. This practice will be applied in the Action Area to facilitate prescribed grazing (528) in order to provide access to drinking water for livestock in order to meet daily water requirements and improve animal distribution to conserve or enhance important LPC habitat.

Practice Application: Watering facilities are commonly designed using concrete, fiberglass, metal, or rubber tires. Each tank is typically fed by a pipeline and also contains an overflow for excess water. Winter tanks are routinely buried or covered to prevent freezing and have small drinking areas exposed. Up to 330 individual facilities will be installed each year throughout the Action Area.

614 Watering Facility anticipate average usage

State	#/yr
Colorado	45
Kansas	200
Oklahoma	75
Texas	15
New Mexico	20

Resource Concerns: The inability to provide adequate water supplies and to properly locate water supplies throughout grazing units can reduce the opportunity to manage livestock grazing distribution. As a result, forage may be over or under-utilized with resulting impacts on range

health, livestock production and associated wildlife habitat. Livestock may be disproportionately concentrated near a water source and overgraze the surrounding area to the point where food producing forbs and legumes are eliminated, residual grasses are inadequate for nesting cover, and protective cover provided by shrubs is reduced due to heavy browsing. Conversely, areas more distant from a water supply may be underutilized and in the absence of disturbance, the health and vigor of grasses for livestock grazing and the value of the habitat for LPC may be diminished through plant succession.

Potential Beneficial Effect(s) to LPC: Use of this practice can facilitate prescribed grazing by livestock and can provide water for some wildlife species, including LPC. This benefit may be especially pronounced during drought conditions.

Potential Adverse Effect(s) to LPC: Short-term and occasional physical disturbance (including noise) and temporary soil and vegetation disturbance during installation. There could also be an increased potential for invasive plants in the disturbed soil post installation. Direct mortality can occur due to drowning and increased predation.

Conservation measures:
NRCS shall coordinate with the affected State Fish and Wildlife Agency and confer with the State Technical Committees to identify appropriate restrictions on the placement, extent, configuration, and timing of this conservation practice standard and the area where these practice restrictions would apply so as to avoid or minimize adverse effects to the LPC and supporting habitat conditions.

Defer implementation of this conservation practice within 1/2 mile to known leks until all breeding and nesting activities are completed, typically March 1 through July 15, or as modified by State Fish and Wildlife Agency or State Technical Committee recommendations. If a modification of the restrictions on the timing of this conservation practice could increase the likelihood or extend to adverse effects, these modifications need to be further coordinated with the Service's local Field Office.

Evaluate the site's potential for soil erosion and invasion by undesirable plants during practice planning and design. Minimize soil and vegetative disturbances during installation of conservation practices. Utilize soil erosion protection measures, if potential for soil erosion exists (silt fences etc.).

Design conservation practice to minimize or avoid loss of shrubs during practice installation. If access for operation and maintenance is required, limit access to one side of disturbance and a limit access to one vehicle width.

Use site specific reclamation strategies developed using ecological site descriptions. Native species will be used whenever possible to meet practice objectives with preference to forbs, grasses and grass-like plants preferred by the LPC as well as those plants that reflect the potential of the specific ecological site to optimize LPC habitat needs. Seed mixes should be State-certified, meeting the appropriate State certification criteria as being free of state declared noxious and invasive vegetative material.

Monitor, evaluate and control State listed invasive and noxious plants during practice planning and design.

Machinery associated with the practice should be clean and free of vegetative debris prior to use to prevent the spread of invasive plant species.
Timing of planting and post-establishment vegetation management will be designed as per local site conditions to meet NRCS practice specifications.

Regularly monitor the site after implementation to ensure erosion and weed issues are addressed quickly.

Install wildlife escape ramps.

Limit duration of construction period to the minimum practicable.

Conservation Practice Standard: Spring Development (574) (FACILITATING STRUCTURAL PRACTICE)

Definition: Collection of water from springs or seeps to provide water for a conservation need.

Purpose: Spring developments will be applied to improve the quantity and quality of water for livestock and wildlife or other agricultural uses. This practice will be used to facilitate prescribed grazing to improve water quality, reduce erosion, protect sensitive areas, and/or improve mesic habitat quality for LPC and broods.

Practice Applications: Natural springs are developed to provide a clean source of water for livestock. Additionally, development of springs may protect the spring's water source from degradation caused by unrestricted livestock use and increase livestock distribution. The actual development of the spring includes installation of a collection point and pipeline for water delivery to a watering facility for livestock use. Light earth-moving equipment may be used implement this practice. Pipeline flow is achieved by gravity or pumping conditions. Up to 80 of these structures will be installed each year throughout the Action Area. Affected area is usually less than 1/8 acre.

574 Spring Development anticipate average usage

State	Total #/yr
Colorado	5
Kansas	80
Oklahoma	0
Texas	0
New Mexico	0

Resource Concerns: The inability to provide adequate water supplies and to properly locate water supplies throughout grazing units can reduce the opportunity to manage livestock grazing distribution. As a result, forage may be over or under-utilized with resulting impacts on range health, livestock production and associated wildlife habitat. Livestock may be disproportionately concentrated near a water source and overgraze the surrounding area to the point where food producing forbs and legumes are eliminated, residual grasses are inadequate for nesting cover, and protective cover provided by shrubs is reduced due to heavy browsing. Conversely, areas more distant from a water supply may be underutilized and in the absence of disturbance, the health and vigor of grasses for livestock grazing and the value of the habitat for LPC may be diminished through plant succession.

Potential Beneficial Effect(s) to LPC: Practice may facilitate improved livestock grazing management, which allows for creation, enhancement or maintenance of nesting and brood-rearing habitat for LPC, and can provide improved water quality and water availability for other wildlife.

Potential Adverse Effect(s) to LPC: Temporary noise and minimal physical disturbance may occur during construction along with short-term reduction of cover that can result in invasive species and erosion problems. Affected area is usually less than 1/8 acre.

Conservation Measures:
NRCS shall coordinate with the affected State Fish and Wildlife Agency and confer with the State Technical Committees to identify appropriate restrictions on the placement, extent, configuration, and timing of this conservation practice standard and the area where these practice restrictions would apply so as to avoid or minimize adverse effects to the LPC and supporting habitat conditions.

Defer implementation of this conservation practice within 1/2 mile to known leks until all breeding and nesting activities are completed, typically March 1 through July 15, or as modified by State Fish and Wildlife Agency or State Technical Committee recommendations. If a modification of the restrictions on the timing of this conservation practice could increase the likelihood or extend to adverse effects, these modifications need to be further coordinated with the Service's local Field Office.

Evaluate the site's potential for soil erosion and invasion by undesirable plants during practice planning and design. Minimize soil and vegetative disturbances during installation of conservation practices. Utilize soil erosion protection measures, if potential for soil erosion exists (silt fences etc).

Use site specific reclamation strategies developed using ecological site descriptions. Native species will be used whenever possible to meet practice objectives with preference to forbs, grasses and grass-like plants preferred by the LPC as well as those plants that reflect the potential of the specific ecological site to optimize LPC habitat needs. Seed mixes should be State-certified, meeting the appropriate State certification criteria as being free of state declared noxious and invasive vegetative material.

Monitor, evaluate and control State listed invasive and noxious plants during practice planning and design.

Machinery associated with the practice should be clean and free of vegetative debris prior to use to prevent the spread of invasive plant species.

Timing of planting and post-establishment vegetation management will be designed as per local site conditions to meet NRCS practice specifications.
Regularly monitor the site after implementation to ensure erosion and weed issues are addressed quickly.

Ingress/egress routes will avoid nesting/brood-rearing/lek areas as mortality may occur on routes resulting from bird-vehicle collisions.

Conservation Practice Standard: Pumping Plant (533) (FACILITATING STRUCTURAL PRACTICE)

Definition: A facility that delivers water at a designed pressure and flow rate. Includes the required pump(s), associated power unit(s), plumbing, appurtenances, and may include on-site fuel or energy source(s), and protective structures.

Purpose: This practice can achieve delivery of water to livestock watering facilities to facilitate prescribed grazing of livestock in a way that promotes rangeland sustainability and improves wildlife and LPC habitat.

Practice Application: Pumping plants installed in Action Area consist of a pump, with solar or fuel generated power sources. It is normally mounted on concrete or pilings. This practice is one part of a watering system that includes the following additional practices: well, pipeline, (to move the water to the desired location), and watering facility (tank/trough where livestock drink the water). NRCS will install up to 180 pumping plants per year in Action Area. This practice can be applied any time of the year when weather conditions allow. A pumping plant takes several days to install because the concrete needs time to cure.

533 Pumping Plant anticipated average usage

State	#/yr
Colorado	40
Kansas	150
Oklahoma	15
Texas	5
New Mexico	10

Resource Concerns: The inability to provide adequate water supplies and to properly locate water supplies throughout grazing units can reduce the opportunity to manage livestock grazing distribution. As a result, forage may be over or under-utilized with resulting impacts on range health, livestock production and associated wildlife habitat. Livestock may be disproportionately concentrated near a water source and overgraze the surrounding area to the point where food producing forbs and legumes are eliminated, residual grasses are inadequate for nesting cover, and protective cover provided by shrubs is reduced due to heavy browsing. Conversely, areas more distant from a water supply may be underutilized and in the absence of disturbance, the health and vigor of grasses for livestock grazing and the value of the habitat for LPC may be diminished through plant succession.

Potential Beneficial Effect(s) to LPC: Practice may facilitate improved livestock grazing management, which allows for creation, restoration or enhancement of nesting and brood-rearing habitat for LPC, and can provide water availability for other wildlife.

Potential Adverse Effect(s) to LPC: Temporary noise and minimal physical disturbance may occur during construction along with short-term reduction of cover that can result in invasive species and erosion problems. Large pumping plants may serve as a raptor perch. When a pumping plant is fuel-powered, there is the possibility of increased noise, human disturbance, and hazardous material spills.

Conservation measures:
NRCS shall coordinate with the affected State Fish and Wildlife Agency and confer with the State Technical Committees to identify appropriate restrictions on the placement, extent, configuration, and timing of this conservation practice standard and the area where these practice restrictions would apply so as to avoid or minimize adverse effects to the LPC and supporting habitat conditions.

Defer implementation of this conservation practice within 1/2 mile to known leks until all breeding and nesting activities are completed, typically March 1 through July 15, or as modified by State Fish and Wildlife Agency or State Technical Committee recommendations. If a modification of the restrictions on the timing of this conservation practice could increase the likelihood or extend to adverse effects, these modifications need to be further coordinated with the Service's local Field Office.

Monitor, evaluate and control State listed invasive and noxious plants during practice planning and design.

Machinery associated with the practice should be clean and free of vegetative debris prior to use to prevent the spread of invasive plant species.

Limit construction and access footprint and future vehicle traffic access to one vehicle width. New windmills for pumping or power generation will not be used within the Action Area (unless individually approved by the Service).

Design solar panel mounting pole as short as possible to avoid use as raptor perch.

Minimize noise levels of fuel- powered plants to less than 40dbA.

Conservation Practice Standard: Water Well (642) (FACILITATING STRUCTURAL PRACTICE)

Definition: A hole drilled, dug, driven, bored, jetted or otherwise constructed to an aquifer for water supply.

Purpose: This practice will be applied to provide water for livestock to facilitate proper use of vegetation through grazing distribution and to provide alternative sources of livestock water to meet the daily animal requirements. The water provided by the well is also used as a part of a watering system that includes watering facilities, pipeline and pumping plant.

Practice Application: Up to 250 of these structures will be installed each year throughout the Action Area. Most water wells within the range of the LPC are dug with rotary drilling rigs where the disturbed site is confined to a small area (less than ¼ acre). Depending on the geology of the site and depth to water, it takes a few days to a few weeks to drill water wells. Well locations are primarily based on proximity to a reliable aquifer and secondly on the water distribution needs of livestock within the grazing units. Water wells can be constructed at any time of the year.

642 Water Well anticipated average usage

State	#/yr
Colorado	20
Kansas	150
Oklahoma	30
Texas	5
New Mexico	5

Resource Concerns: The inability to provide adequate water supplies and to properly locate water supplies throughout grazing units can reduce the opportunity to manage livestock grazing distribution. As a result, forage may be over or under-utilized with resulting impacts on range health, livestock production and associated wildlife habitat. Livestock may be disproportionately concentrated near a water source and overgraze the surrounding area to the point where food producing forbs and legumes are eliminated, residual grasses are inadequate for nesting cover, and protective cover provided by shrubs is reduced due to heavy browsing. Conversely, areas more distant from a water supply may be underutilized and in the absence of disturbance, the health and vigor of grasses for livestock grazing and the value of the habitat for LPC and other wildlife may be diminished through plant succession. These potential impacts on livestock grazing and wildlife habitat need to be considered when planning wells and other water supply sources.

Potential Beneficial Effect(s) to LPC: If properly designed and installed, this practice can be implemented in a manner that will facilitate improved distribution of livestock grazing and result

in improved vegetative diversity and structure of LPC habitat. The practice can also provide a supplemental water source for LPC and other wildlife. The disturbed area around the water well installation may re-vegetate with early succession forbs and legumes that can provide food and brood-rearing habitat for LPCs.

Potential Adverse Effect(s) to LPC: Adverse impacts may result from digging or drilling the water well during reproductive and nesting periods. These impacts could include disturbance of breeding activities on lek sites, disturbance of nesting hens, or physical destruction of nests and eggs. High profile pumping devices, housing structures, and electric poles/lines could provide vertical structure for raptor perch sites. These potential perch sites could contribute to habitat fragmentation by causing LPC to avoid areas around the structures that what would otherwise provide suitable habitat. Undesirable plants may become established on disturbed soils which could reduce the quality and quantity of LPC habitat. If improperly located and implemented without a grazing management plan, the increased water availability and distribution could alter livestock grazing patterns and change plant composition and structure with negative impacts on LPC habitat.

Conservation Measures:
NRCS shall coordinate with the affected State Fish and Wildlife Agency and confer with the State Technical Committees to identify appropriate restrictions on the placement, extent, configuration, and timing of this conservation practice standard and the area where these practice restrictions would apply so as to avoid or minimize adverse effects to the LPC and supporting habitat conditions.

Defer implementation of this conservation practice within 1/2 mile to known leks until all breeding and nesting activities are completed, typically March 1 through July 15, or as modified by State Fish and Wildlife Agency or State Technical Committee recommendations. If a modification of the restrictions on the timing of this conservation practice could increase the likelihood or extend to adverse effects, these modifications need to be further coordinated with the Service's local Field Office.

Install low profile pumping devices and housings and use solar pumps whenever practicable, as the power source for wells rather than electric lines.

Place wells and infrastructure as close as possible to existing structures rather than creating new vertical structure in areas presently devoid of such features. These measures will reduce the presence of raptor perch sites and prevent habitat fragmentation by allowing continued use of suitable habitat.

Design the water well to minimize or avoid the loss of desirable shrubs during practice installation.

Use the conservation measures provided for the facilitative practice of Critical Area Planting (342) in areas where reseeding disturbed areas is needed.

Design solar panel mounting pole as short as possible to avoid use as raptor perch.

Conservation Practice Standard: Pipeline (516) (FACILITATING STRUCTURAL PRACTICE)

Definition: Pipeline having an inside diameter of 8 inches or less.

Purpose: The purpose of this practice is to convey water from a source of supply to points of use for livestock, wildlife, or recreational purposes. Typically, the water conveyed by a pipeline originates from a well, spring, or in some cases, ponds and streams. The practice is most commonly used to facilitate proper use of vegetation through grazing distribution, to meet the daily water requirements of livestock, or to provide alternative sources of livestock water away from streams and aquatic habitats.

Practice Applications: Up to 160,000 linear feet of pipelines will be installed each year throughout the Action Area. Pipelines are typically installed by laying steel or plastic pipe within a trench excavated by trenching machines or by bulldozer ripping. The pipe is buried below the frost line in order to avoid freezing and to prevent damage to the line. The combined width of the trench and area of soil disturbance is relatively narrow (typically less than 6 feet).

516 Pipeline anticipated average usage

State	ft/yr
Colorado	200,000
Kansas	20,000
Oklahoma	65,000
Texas	70,000
New Mexico	75,000

Resource Concerns: The inability to provide adequate water supplies and to properly locate water supplies throughout grazing units can reduce the opportunity to manage livestock grazing distribution. As a result, forage may be over or under-utilized with resulting impacts on range health, livestock production and associated wildlife habitat. Livestock may be disproportionately concentrated near a water source and overgraze the surrounding area to the point where food producing forbs and legumes are eliminated, residual grasses are inadequate for nesting cover, and protective cover provided by shrubs is reduced due to heavy browsing. Conversely, areas more distant from a water supply may be underutilized and in the absence of disturbance, the health and vigor of grasses for livestock grazing and the value of the habitat for LPC may be diminished through plant succession.

Potential Beneficial Effect(s) to LPC: Practice may facilitate improved livestock grazing management, which allows for creation, maintenance or enhancement of nesting and brood-rearing habitat for LPC, and can provide water availability for other wildlife. The disturbed area created by construction activities along the pipeline route may support early succession forbs and legumes that can provide food and brood-rearing habitat for LPCs.

Potential Adverse Effect(s) to LPC: Temporary noise and minimal physical disturbance may occur during construction along with short-term reduction of cover that can result in invasive species and erosion problems. Adverse impacts may result from constructing and installing the pipeline during reproductive and nesting periods. Undesirable plants may become established on disturbed soils which could reduce the quality and quantity of LPC habitat. Beneficial shrubs such as sand sagebrush and shinnery oak could be removed during construction.

Conservation Measures:
NRCS shall coordinate with the affected State Fish and Wildlife Agency and confer with the State Technical Committees to identify appropriate restrictions on the placement, extent, configuration, and timing of this conservation practice standard and the area where these practice restrictions would apply so as to avoid or minimize adverse effects to the LPC and supporting habitat conditions.

Defer implementation of this conservation practice within 1/2 mile to known leks until all breeding and nesting activities are completed, typically March 1 through July 15, or as modified by State Fish and Wildlife Agency or State Technical Committee recommendations. If a modification of the restrictions on the timing of this conservation practice could increase the likelihood or extend to adverse effects, these modifications need to be further coordinated with the Service's local Field Office.

Use site specific reclamation strategies developed using ecological site descriptions. Native species will be used whenever possible to meet practice objectives with preference to forbs, grasses and grass-like plants preferred by the LPC as well as those plants that reflect the potential of the specific ecological site to optimize LPC habitat needs. Seed mixes should be State-certified, meeting the appropriate State certification criteria as being free of state declared noxious and invasive vegetative material.

Design the pipeline route to minimize or avoid the loss of desirable shrubs during practice installation.

Monitor, evaluate and control State listed invasive and noxious plants during practice planning and design.

Machinery associated with the practice should be clean and free of vegetative debris prior to use to prevent the spread of invasive plant species.

Timing of planting and post-establishment vegetation management will be designed as per local site conditions to meet NRCS practice specifications.

Regularly monitor the site after implementation to ensure erosion and weed issues are addressed quickly.

Use the conservation measures provided for the facilitative practice of Critical Area Planting (342) in areas where reseeding disturbed areas is needed.

Conservation Practice Standard: Grade stabilization structure (410) (FACILITATING STRUCTURAL PRACTICE)

Definition: A structure used to control the grade and head cutting in natural or artificial channels.

Purpose: This practice may be applied to stabilize the grade and control erosion in natural or artificial channels; to prevent the formation or advance of gullies, restore associated hydrology to surrounding lands, and to enhance environmental quality by reducing siltation or pollution hazards. Up to 10 of these structures will be installed each year throughout the Action Area.

Practice Application: When used to restore hydrology to a degraded site: the water table in the incised channels and ditches will be elevated using a variety of approaches to reestablish the natural hydrology. The practice may include one or more of the following: (1) depositing and compacting appropriate fill material (soil) into these incised channels; (2) installation of hard structure (plastic sheet pile, rock, brush, or gabion structures) (3) planting of native or non-invasive introduced vegetation according to the 342 CPS will be used for vegetating any disturbed areas in association with the installation of grade stabilization structure.

410 Grade Stabilization Structure anticipated average usage

State	#/yr
Colorado	5
Kansas	0
Oklahoma	5
Texas	0
New Mexico	0

Resource concerns: Erosion control.

Potential Beneficial Effect(s) to LPC: This practice can control erosion that if left unchecked can result in habitat loss or degradation.

Potential Adverse Effect(s) to LPC: Temporary physical disturbance (including noise), soil and vegetation disturbance and increased potential for invasive plants. Individual mortality risk from vehicle strikes.

Conservation measures:
NRCS shall coordinate with the affected State Fish and Wildlife Agency and confer with the State Technical Committees to identify appropriate restrictions on the placement, extent, configuration, and timing of this conservation practice standard and the area where these practice restrictions would apply so as to avoid or minimize adverse effects to the LPC and supporting habitat conditions.

Defer implementation of this conservation practice within 1/2 mile to known leks until all breeding and nesting activities are completed, typically March 1 through July 15, or as modified by State Fish and Wildlife Agency or State Technical Committee recommendations. If a modification of the restrictions on the timing of this conservation practice could increase the likelihood or extend to adverse effects, these modifications need to be further coordinated with the Service's local Field Office.

Evaluate the site's potential for soil erosion. Minimize soil and vegetative disturbances during installation of conservation practices. During installation, utilize soil erosion protection measures if potential for off-site soil erosion exists.

Use site specific reclamation strategies developed using ecological site descriptions. Native species will be used whenever possible to meet practice objectives with preference to forbs, grasses and grass-like plants preferred by the LPC as well as those plants that reflect the potential of the specific ecological site to optimize LPC habitat needs. Seed mixes should be State-certified, meeting the appropriate State certification criteria as being free of state declared noxious and invasive vegetative material.

Monitor, evaluate and control State listed invasive and noxious plants during practice planning and design.
Machinery associated with the practice should be clean and free of vegetative debris prior to use to prevent the spread of invasive plant species.

Timing of planting and post-establishment vegetation management will be designed as per local site conditions to meet NRCS practice specifications.

Regularly monitor the site after implementation to ensure erosion and weed issues are addressed quickly.

Ingress/egress routes will avoid nesting/brood-rearing/lek areas as mortality may occur on routes.

Use the conservation measures provided for the facilitative practice of Critical Area Planting (342) in areas where reseeding disturbed areas is needed.

Conservation Practice Standard: Fence (382) (FACILITATING STRUCTURAL PRACTICE)

Definition: A constructed barrier to animals or people.

Purpose: This practice facilitates the accomplishment of conservation objectives by providing a constructed means to control movement of animals and people, including vehicles. The need and extent of this practice is determined based on the particular management practice it facilitates, such as prescribed grazing or access control.

Practice Application: Up to 500 miles of fence will be installed each year throughout the Action Area. The practice application includes construction of barbed wire and electric fence.

382 Fence anticipated average usage

State	mi/yr
Colorado	34
Kansas	76
Oklahoma	4
Texas	4
New Mexico	6

Resource Concerns: The concerns typically addressed by a constructed fence are plant health and vigor, soil erosion and condition, livestock health and vigor and wildlife habitat needs.

Potential Beneficial Effect(s) to LPC: This practice can be an effective tool for managing wild and domestic animal disturbance to LPC habitat, including reseeded or reclaimed sites. Fence is typically used to facilitate prescribed grazing, to areas targeted for creation or protection of specific habitat needs.

Potential Adverse Effects(s) to LPC: Noise and physical disturbance during implementation; invasive plants following implementation; incidental damage or removal of desirable shrub during or prior to implementation; accidental mortality by way of collisions by flying LPC after implementation, and potentially altering predator routes during and after implementation.

Conservation Measures:
NRCS shall coordinate with the affected State Fish and Wildlife Agency and confer with the State Technical Committees to identify appropriate restrictions on the placement, extent, configuration, and timing of this conservation practice standard and the area where these practice restrictions would apply so as to avoid or minimize adverse effects to the LPC and supporting habitat conditions.

Defer implementation of this conservation practice within 1/2 mile to known leks until all breeding and nesting activities are completed, typically March 1 through July 15, or as modified by State Fish and Wildlife Agency or State Technical Committee recommendations. If a modification of the restrictions on the timing of this conservation practice could increase the likelihood or extend to adverse effects, these modifications need to be further coordinated with the Service's local Field Office.

Alternatives to fencing will be evaluated prior to fence installation (e.g., water placement, placement of minerals, prescribed burning to achieve the desired outcome.

Machinery associated with the practice should be clean and free of vegetative debris prior to use to prevent the spread of invasive plant species.

Shrub removal will only occur in a < 20 ft. wide swath where fences are being constructed.

Mark fences within 1/4 mile of a known lek when construction can't be avoided or relocated

.

Temporary electric fencing may be used in some cases to minimize potential collision fatalities.

Permanent interior fence requires a maximum of 4 strands of wire < 44 inches high.

Permanent exterior fencing must meet local fence laws and insurance liability clauses.

Use the conservation measures provided for the facilitative practice of Critical Area Planting (342) in areas where reseeding disturbed areas is needed.

Conservation Practice Standard: Obstruction Removal (500) (FACILITATING STRUCTURAL PRACTICE)

Definition: Removal and disposal of buildings, structures, other works of improvement, vegetation, debris or other materials.

Purpose: This practice may be applied to remove and dispose of unwanted obstructions in order to apply conservation practices or facilitate the planned land use. The practice will be used to decrease availability of predator nests, dens, and perches, and reduce habitat fragmentation.

Practice Application: Specifically, NRCS will use obstruction removal to remove unneeded fences, windmills, power poles, and buildings. Typical building site removals are less than 0.5 acres each. It is anticipated NRCS will remove 50,000 linear feet of fences and remove 30 of these other obstructions per year over the Action Area. Heavy machinery, chainsaws, haul trucks and hand labor are used to facilitate obstruction removal. This can occur any time of the year when weather conditions allow access to the site.

500 Obstruction Removal anticipated average usage

State	
Colorado	5 ac/yr structures 7,500 lf
Kansas	25,000 linear ft/yr and 20 structures/yr
Oklahoma	10,000 linear ft/yr and 3 structures/yr
Texas	10,000 LF and 5 structures
New Mexico	20,000 linear ft/yr

Resource concerns: Structures, including buildings, power poles, and fences can provide predator perches and nesting sites and can increase predation rates for wildlife including LPC and may cause wildlife to decrease use of otherwise suitable habitats. Additionally, these structures, particularly fences, can cause accidental mortality from collisions and can contribute to habitat fragmentation for LPC.

Potential Beneficial Effect(s) to LPC: Practice will benefit LPC by removing unnecessary fences that contribute to fragmentation and direct mortality due to collisions; removing unneeded power poles or infrastructure that provides predator perches; and removing structures that serve as mammalian predator habitat and/or visual/psychological obstructions that cause LPC to partially or completely abandon otherwise suitable habitat.

Potential Adverse Effect(s) to LPC: Temporary physical disturbance (including noise), soil and vegetation disturbance and increased potential for invasive plants. Collisions with vehicles or other motorized equipment may result in individual mortality to LPC.

Conservation measure(s):
Defer implementation of this conservation practice within 1/2 mile to known leks until all breeding and nesting activities are completed, typically March 1 through July 15, or as modified by State Fish and Wildlife Agency or State Technical Committee recommendations. If a modification of the restrictions on the timing of this conservation practice could increase the likelihood or extend to adverse effects, these modifications need to be further coordinated with the Service's local Field Office.

Evaluate the site's potential for soil erosion. Minimize soil and vegetative disturbances during installation of conservation practices. During installation, utilize soil erosion protection measures if potential for off-site soil erosion exists.
Use site specific reclamation strategies developed using ecological site descriptions. Native species will be used whenever possible to meet practice objectives with preference to forbs, grasses and grass-like plants preferred by the LPC as well as those plants that reflect the potential of the specific ecological site to optimize LPC habitat needs. Seed mixes should be State-certified, meeting the appropriate State certification criteria as being free of state declared noxious and invasive vegetative material.

Monitor, evaluate and control State listed invasive and noxious plants during practice planning and design.

Machinery associated with the practice should be clean and free of vegetative debris prior to use to prevent the spread of invasive plant species.

Regularly monitor the site after implementation to ensure erosion and weed issues are addressed quickly.

Ingress/egress routes will avoid nesting/brood-rearing/lek areas as mortality may occur on routes. Use the conservation measures provided for the facilitative practice of Critical Area Planting (342) in areas where reseeding disturbed areas is needed.

Conservation Practice Standard: Pond (378) (FACILITATING STRUCTURAL PRACTICE)

Definition: A water impoundment made by constructing an embankment or by excavating a pit or dugout. In this standard, ponds constructed by the first method are referred to as embankment ponds, and those constructed by the second method are referred to as excavated ponds. Ponds constructed by both the excavation and the embankment methods are classified as embankment ponds if the depth of water impounded against the embankment at the auxiliary spillway elevation is 3 feet or more.

Purpose: The purpose of this practice is to provide water for livestock, fish and wildlife, recreation, fire control, and other related uses and to maintain or improve water quality.

Practice Application: Within the range of the LPC, ponds are typically installed by constructing embankments across upland drains and storing periodic runoff water for use by livestock. In some situations, pit ponds are excavated to collect runoff water or to expose the water table and allow for use by livestock. The average surface area of ponds within LPC range is 1 to 2 acres. This practice will be used very infrequently. The five participating states estimate that less than 10 structures per year will be constructed within the Action Area.

378 Pond anticipated average usage

State	#/yr
Colorado	5
Kansas	1
Oklahoma	5
Texas	0
New Mexico	0

Resource Concerns: The inability to provide adequate water supplies and to properly locate water supplies throughout grazing units can reduce the opportunity to manage livestock grazing distribution. As a result, forage may be over or under-utilized with resulting impacts on range health, livestock production and associated wildlife habitat. Livestock may be disproportionately concentrated near a water source and overgraze the surrounding area to the point where food producing forbs and legumes are eliminated, residual grasses are inadequate for nesting cover, and protective cover provided by shrubs is reduced due to heavy browsing. Conversely, areas more distant from a water supply may be underutilized and in the absence of disturbance, the health and vigor of grasses for livestock grazing and the value of the habitat for LPC may be diminished through plant succession.

Potential Beneficial Effect(s) to LPC: This practice facilitates improved distribution of livestock grazing and result in improved vegetative diversity and structure of LPC habitat. This practice can also provide a supplemental water source for some wildlife species.

Potential Adverse Effect(s) to LPC: Potentially there will be a small amount (10-20 acres per year cumulatively) of prairie-chicken nesting, brood-rearing, and foraging habitat permanently lost. Adverse impacts may result from constructing the pond during reproductive and nesting periods. Potential LPC habitat consisting of grasses and shrubs would be permanently replaced with water. Pond construction could result in the concentration of livestock activity near the pond which could make the habitat less attractive to LPCs. Undesirable plants, including woody vegetation may become established on disturbed soils which could reduce the quality and quantity of LPC habitat.

Conservation Measures:
NRCS shall coordinate with the affected State Fish and Wildlife Agency and confer with the State Technical Committees to identify appropriate restrictions on the placement, extent, configuration, and timing of this conservation practice standard and the area where these practice restrictions would apply so as to avoid or minimize adverse effects to the LPC and supporting habitat conditions.

Defer implementation of this conservation practice within 1/2 mile to known leks until all breeding and nesting activities are completed, typically March 1 through July 15, or as modified by State Fish and Wildlife Agency or State Technical Committee recommendations. If a modification of the restrictions on the timing of this conservation practice could increase the likelihood or extend to adverse effects, these modifications need to be further coordinated with the Service's local Field Office.

Use site specific reclamation strategies developed using ecological site descriptions. Native species will be used whenever possible to meet practice objectives with preference to forbs, grasses and grass-like plants preferred by the LPC as well as those plants that reflect the potential of the specific ecological site to optimize LPC habitat needs. Seed mixes should be State-certified, meeting the appropriate State certification criteria as being free of state declared noxious and invasive vegetative material.

Monitor, evaluate and control State listed invasive and noxious plants during practice planning and design.

Machinery associated with the practice should be clean and free of vegetative debris prior to use to prevent the spread of invasive plant species.

Use the conservation measures provided for the facilitative practice of Critical Area Planting (342) in areas where reseeding disturbed areas is needed.

This practice will only be applied where needed to meet the daily water requirements of livestock and to facilitate prescribed livestock grazing distribution.

Conservation Practice Standard: Heavy Use Area Protection (561) (FACILITATING STRUCTURAL PRACTICE)

Definition: The stabilization of areas frequently and intensively used by people, animals, or vehicles by establishing vegetative cover, surfacing with suitable materials, and/or installing needed structures.
Purpose: To provide a stable, non-eroding surface for areas frequently used by animals, people, or vehicles and to protect and improve water quality.

Practice Application: This practice will be implemented in conjunction with Conservation Practice 614 Watering Facility. Use of 561 Heavy Use Area Protection will consist of the following when implemented with watering facilities; The area around watering facilities shall be protected from undermining by constructing an apron around the facility using gravel, concrete, pavement or other cementitious materials.

The practice will be utilized only in conjunction with and as a supporting practice for Conservation Practice 614 Watering Facility and is planned to be utilized 330 times per year as indicated in the table below.

561 Heavy Use Area Protection anticipated average usage

State	Total ac/yr
Colorado	45
Kansas	200
Oklahoma	75
Texas	10
New Mexico	10

Resource concerns: The inability to provide adequate water supplies and to properly locate water supplies throughout grazing units can reduce the opportunity to mange livestock grazing distribution. As a result, forage may be over or under-utilized with resulting impacts on range health, livestock production and associated wildlife habitat. Livestock may be disproportionately concentrated near a water source and overgraze the surrounding area to the point where food producing forbs and legumes are eliminated, residual grasses are inadequate for nesting cove r, and protective cover provided by shrubs is reduced due to heavy browsing. Conversely, areas more distant from a water supply may be underutilized and in the absence of disturbance, the health and vigor of grasses for livestock grazing and the value of the habitat for LPC may be diminished through plant succession. Without proper protection in the area immediately surrounding the tank this area will become prone to erosion and water quality concerns.

Potential beneficial effect(s) to LPC: Use of this practice in conjunction with and as a supporting practice for watering facilities can facilitate prescribed grazing by livestock to

conserve or enhance important LPC habitat and can provide water for some wildlife species, including LPC. These benefits may be especially pronounced during drought conditions.

Potential adverse effect(s) to LPC: Short-term and occasional physical disturbance (including noise) and temporary soil and vegetation disturbance during installation. There could also be an increased potential for invasive plants in the disturbed soil post installation. Direct mortality can occur due to drowning and increased predation at the watering facility.

Conservation Measures:
NRCS shall coordinate with the affected State Fish and Wildlife Agency and confer with the State Technical Committees to identify appropriate restrictions on the placement, extent, configuration, and timing of this conservation practice standard and the area where these practice restrictions would apply so as to avoid or minimize adverse effects to the LPC and supporting habitat conditions.

Defer implementation of this conservation practice within 1/2 mile to known leks until all breeding and nesting activities are completed, typically March 1 through July 15, or as modified by State Fish and Wildlife Agency or State Technical Committee recommendations. If a modification of the restrictions on the timing of this conservation practice could increase the likelihood or extend to adverse effects, these modifications need to be further coordinated with the Service's local Field Office.

Evaluate the site's potential for soil erosion and invasion by undesirable plants during practice planning and design. Minimize soil and vegetative disturbances during installation of conservation practices. Utilize soil erosion protection measures, if potential for soil erosion exists (silt fences etc.).

Design conservation practice to minimize or avoid loss of shrubs during practice installation. If access for operation and maintenance is required, limit access to one side of disturbance and limit access to one vehicle width.

Use site specific reclamation strategies developed using ecological site descriptions. Native species will be used whenever possible to meet practice objectives with preference to forbs, grasses and grass-like plants preferred by the LPC as well as those plants that reflect the potential of the specific ecological site to optimize LPC habitat needs. Seed mixes should be State-certified, meeting the appropriate State certification criteria as being free of state declared noxious and invasive vegetative material.

Monitor, evaluate and control State listed invasive and noxious plants during practice planning and design.

Machinery associated with the practice should be clean and free of vegetative debris prior to use to prevent the spread of invasive plant species.

Timing of planting and post-establishment vegetation management will be designed as per local site conditions to meet NRCS practice specifications.

Regularly monitor the site after implementation to ensure erosion and weed issues are addressed quickly.

Limit duration of construction period to the minimum practicable.

Conservation Practice Standard: Well Decommissioning (351) (FACILITATING STRUCTURAL PRACTICE)

Definition: The sealing and permanent closure of a water well no longer in use.

Purpose: This practice is applied to prevent entry of animals, debris or other foreign substances into well or well bore hole; to eliminate the physical hazard of an open hole to people, animals, and farm machinery; prevent entry of contaminated surface water into well and migration of contaminants into unsaturated (vadose) zone or saturated zone; prevent commingling of chemically or physically different ground waters between separate water bearing zones; eliminate possibility of well being used for any other purpose; conserve yield and hydrostatic head of aquifers; and restore, as far as feasible, hdrogeologic conditions that existed before well was constructed.

Practice Application: This practice applies to any drilled, dug, driven, bored, or otherwise constructed vertical water well determined to have no further beneficial use. This practice does not apply to water wells that were used for waste disposal, petroleum wells or geothermal wells.

351 Well Decommissioning anticipated average usage

State	#/yr
Colorado	
Kansas	
Oklahoma	
Texas	5
New Mexico	

Resource Concerns: This practice will be applied to abandoned water wells on rangeland sites in LPC range. Failure to properly decommission a water well could cause resource concerns related to water quality, grazing animals, and human activity.

Potential Beneficial Effect(s) to LPC: This practice when accompanied by a properly designed and constructed water well or other water development facility will facilitate improved distribution of livestock grazing and result in improved vegetative diversity and structure of LPC habitat.

Potential Adverse Effect(s) to LPC: Adverse impacts may result from disturbance around the abandoned water well during reproductive and nesting periods. These impacts could include disturbance of breeding activities on lek sites, disturbance of nesting hens, or physical

destruction of nests and eggs. Undesirable plants may become established on disturbed soils which could reduce the quality and quantity of LPC habitat.

Conservation Measures:
NRCS shall coordinate with the affected State Fish and Wildlife Agency and confer with the State Technical Committees to identify appropriate restrictions on the placement, extent, configuration, and timing of this conservation practice standard and the area where these practice restrictions would apply so as to avoid or minimize adverse effects to the LPC and supporting habitat conditions.

Defer implementation of this conservation practice within 1/2 mile to known leks until all breeding and nesting activities are completed, typically March 1 through July 15, or as modified by State Fish and Wildlife Agency or State Technical Committee recommendations. If a modification of the restrictions on the timing of this conservation practice could increase the likelihood or extend to adverse effects, these modifications need to be further coordinated with the Service's local Field Office.

Use the conservation measures provided for the facilitative practice of Critical Area Planting (342) in areas where reseeding disturbed areas is needed.

APPENDIX V –Listed and Candidate Species Occurring in the LPCI Action Area

Taxon: Fishes
Common Name: Arkansas Darter
Scientific Name: *Etheostoma cragini*
Federal Status: Candidate
Threats: Water depletion from groundwater pumping, drying of spring-fed streams and marshes, and stream dewatering reduces available habitat. Groundwater depletion (irrigation) and water quality degradation are tied to agricultural practices, such as CAFOs. Water quality parameters include nutrient enrichment and turbidity, which decreases dissolved oxygen and increases water temperatures. Declining peak flows cause vegetation encroachment into formerly un-vegetated portions of the stream channel. Sedimentation from crop field runoff and over-grazing of riparian areas impacts spawning habitat and water quality. Rapid urban and suburban development affects hydrology, and increases sedimentation, chemical pollution, and physical habitat destruction. Dams and their resulting reservoirs act as barriers to emigration upstream and downstream through the reservoir pool. Increased or protracted drought related to climate change also could exacerbate these impacts.
Conservation Measures: (1) Assist in implementing salt cedar control programs. (2) Avoid any LPCI practice that removes ground water or causes drying of surface water in the immediate area occupied by the species.
References: U.S. Fish and Wildlife Service – Species Assessment and Listing Priority Form – Arkansas Darter – October 22, 2010

Taxon: Fishes
Common Name: Arkansas River Shiner
Scientific Name: *Notropis girardi*
Federal Status: Threatened
Threats: Some agricultural practices have contributed to water quality degradation because such practices contribute excess nutrients, sediments, chemicals, and other types of non-point source pollutants through runoff from range, pastureland, and/or tilled fields.
Conservation Measures: (1) Protect and enhance riparian and stream habitat with riparian buffers, exclusion of livestock from streams, and control of salt cedar and other non-native vegetation. (2) Avoid any practice that removes ground water or causes drying of surface water occupied by the species.
References: U.S. Fish and Wildlife Service – Spotlight Species Action Plan, August 6, 2009

Taxon: Mammals
Common Name: Black-footed Ferret
Scientific Name: *Mustela nigripes*
Federal Status: Endangered/ Endangered Experimental Population
Threats: Prairie dog occupied habitat is highly fragmented and repeatedly impacted by poisoning and/or disease, with few complexes of a size adequate to support black-footed ferrets. The quality of the remaining black-footed ferret habitat has been adversely impacted by the presence of disease, poisoning, and recreational prairie dog shooting resulting in the loss of prey base. Additionally, several other diseases, including coccidiosis, cryptosporidiosis, and

hemorrhagic syndrome sometimes affect captive populations. Climate change and the genetic fitness of black-footed ferrets are continuing threats.
Conservation Measure: Avoid any vegetative management practices, such as planting, that would make the habitat potentially unsuitable for prairie dogs, and thus for black-footed ferrets. Note that habitat restoration, prescribed grazing, brush management, and access control may have beneficial effects to the black-footed ferret.
References: U.S. Fish and Wildlife Service – Black-footed Ferret (*Mustela nigripes*) 5-Year Status Review: Summary and Evaluation – November 2008

Taxon: Reptiles
Common Name: Dune sagebrush lizard
Scientific Name: *Sceloporus arenicolus*
Federal Status: At-Risk Species of special interest, as of 2012 it is no longer a Candidate species
Threats: Large-scale habitat destruction is the major threat to the continued existence of *S. arenicolus* in southeastern New Mexico (Painter 2004). Widespread uses of herbicide for shinnery oak control and activities associated with oil/gas extraction have the greatest potential to cause significant Sand Dune Lizard population extinction or reduction (Peterson and Boyd 1998, Painter 2004). The short-term effect of these activities is lizard population decline resulting from development of a grassland habitat that is unsuitable for the lizard (unless this new habitat retains large blowouts, in which case it is capable of supporting very small populations of *Sceloporus arenicolus* for at least ten years after treatment; e.g., see Snell et al. 1993, Gorum et. al., 1995). The long-term effect of these habitat modifications are unknown, but increased habitat fragmentation results in increased probability of extinction of individual populations (Painter 2004). In the mid-1990s, the BLM Roswell Resource Area placed a moratorium on chemical treatment of shinnery oak - sand dune habitat. However, the long-term future of this moratorium is uncertain. Other activities with the potential for habitat destruction (i.e., ORV use, livestock grazing, and fire) have been little studied or are considered of lesser importance (Painter 2004).
Conservation Measures: (1) Avoid implementation of conservation practices during the critical periods of March 1st through July 15th to avoid disturbances. (2) Avoid brush control treatments to large blocks or strips and no more than 50 percent of an individual management unit (pasture) will be treated during any two year period. (3) Establish a grazing plan that ensures: stocking rates are in balance with the forage supply; season of use is rotated through pastures to ensure plants have adequate reproduction opportunity; and that the plan is implemented to increase residual cover of perennial grasses and forbs.
References: Candidate Conservation Agreement for the Lesser Prairie Chicken and the Dunes Sagebrush Lizard in New Mexico 2008 and The Texas Conservation Plan for the Dunes Sagebrush Lizard 2011;
http://www.iucnredlist.org/apps/redlist/details/64087/0

Taxon: Plants
Common Name: Gypsum Wild Buckwheat
Scientific Name: *Eriogonum gypsophilum*
Federal Status: Threatened with Critical Habitat
Threats: *Eriogonum gypsophilum* was originally known from only one locality on BLM and BOR land (Seven River Hills, Eddy County). In 1988, two additional populations (Black River and Ben Slaughter Draw) were documented. Population abundance has remained stable since this species was first listed. Threats include off-road-vehicle (ORV) use, trampling and grazing by cattle, road improvements, oil and gas development, mineral extraction, and water level management in Brantley Reservoir.
Threats Citation: U.S Fish and Wildlife Service - Gypsum Wild Buckwheat (*Eriogonum gypsophilum*) Recovery Plan 1984
Conservation Measure: Protection of habitat (gypsum soils and outcrops) and individual plants is the highest priority for the conservation of this species.
References: U.S. Fish and Wildlife Service - Gypsum Wild Buckwheat (Eriogonum gypsophilum) Recovery Plan 1984 and Gypsum Wild Buckwheat (*Eriogonum gypsophilum*) 5-Year Review: Summary and Evaluation 2007

Taxon: Birds
Common Name: Interior Least Tern
Scientific Name: *Sterna antillarum athalassos*
Federal Status: Endangered
Threats: Many nesting areas have been permanently flooded by reservoirs and channelization projects. Unpredictable water discharge patterns below dams flood nesting areas. Overgrowth of brush and trees also eliminates remaining habitat. This prevents terns from using these areas as nesting sites. The recreational use of sandbars by humans is a major threat to the tern's reproductive success.
Conservation Measures: (1) Protect and enhance riparian and stream habitat with riparian buffers, exclusion of livestock from streams, and control of salt cedar and other non-native vegetation. (2) Identify areas infested by saltcedar or Russian olive and assess which conservation measures would be the most practical and effective for restoring historic levels of base flows. (3) Reduce perching sites and habitat for potential predators.
References: Kevin Stubbs, Fish and Wildlife Biologist, U.S. Fish & Wildlife Service

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Taxon: Snails
Common Name: Koster's Springsnail
Scientific Name: *Juturnia kosteri*
Federal Status: Endangered
Threats: The loss or alteration of spring habitat continues to be the main threat with potential failure of spring flow due to excessive groundwater pumping or drought or both, which would result in total habitat loss for the species. Water contamination, particularly from oil and gas operations, is a significant threat. Fire suppression is largely restricted to established roads due to the safety hazards of transporting equipment over karst terrain, which severely limits the ability to quickly suppress fires that threaten fragile aquatic habitats. Springsnails and

amphipods are a food source for other aquatic animals, such as crayfish, fish, and aquatic snails. Seeps and springs currently occupied have been perennial, even during times of drought, suggesting that these springs are relatively resilient to drought. However, climate change may test that resiliency.
Conservation Measures: (1) Protect water quality and improve land management practices surrounding occupied habitat. (2) Restrict access to occupied habitat. (3) Avoid use of prescribed burning to control invasive vegetation in occupied habitat. (4) Avoid any practice that removes ground water or causes drying of surface water in the immediate area occupied by the species.
References: U.S. Fish and Wildlife Service - Four Bitter Lake Invertebrates 5-Year Review, December 28, 2010

Taxon: Plants
Common Name: Kuenzler's Hedgehog Cactus
Scientific Name: *Echinocereus fendleri var. kuenzleri*
Federal Status: Endangered
Threats: *Echinocereus fendleri* var. *kuenzleri* was originally known from only two locations (Rio Hondo and Rio Penasco drainages) in Lincoln, Otero, and Chaves Counties. Threats include collecting for private and commercial use, road improvement and maintenance, and incompatible livestock grazing.
Conservation Measure: Protection of habitat (pinon-juniper savanna) and individual plants is the highest priority for the conservation of this species.
References: U.S. Fish and Wildlife Service - Kuenzler's Hedgehog Cactus (*Echinocereus fendleri* var. *kuenzleri*) Recovery Plan 1985 and Kuenzler's Hedgehog Cactus (*Echinocereus fendleri* var. *kuenzleri*) 5-Year Review 2005

Taxon: Crustaceans
Common Name: Noel's Amphipod
Scientific Name: *Gammarus desperatus*
Federal Status: Endangered
Threats: The loss or alteration of spring habitat continues to be the main threat with potential failure of spring flow due to excessive groundwater pumping or drought or both, which would result in total habitat loss for the species. Fire suppression is largely restricted to established roads due to the safety hazards of transporting equipment over karst terrain, which severely limits the ability to quickly suppress fires that threaten fragile aquatic habitats. Springsnails and amphipods are a food source for other aquatic animals, such as crayfish, fish, and aquatic snails. Seeps and springs currently occupied have been perennial, even during times of drought, suggesting that these springs are relatively resilient to drought.
Conservation Measures: (1) Protect water quality and improve land management practices surrounding occupied habitat. (2) Restrict access to occupied habitat. (3) Avoid use of prescribed burning to control invasive vegetation in occupied habitat. (4) Avoid any practice that removes ground water or causes drying of surface water in the immediate area occupied by the species.

References: U.S. Fish and Wildlife Service - Four Bitter Lake Invertebrates 5-Year Review, December 28, 2010

Taxon: Birds
Common Name: Northern Aplomado Falcon
Scientific Name: *Falco femoralis septentrionalis*
Federal Status: Endangered
Threats: Brush encroachment, catastrophic channelization of desert streams that would have provided wetland communities for avian prey species, pesticide contamination, and collecting were cited as reasons for decline in the Recovery Plan. Currently, long-term drought, shrub encroachment in areas of Chihuahuan Desert grasslands, and the increased presence of the great horned owl, which preys upon the falcon, may be limiting recovery of this subspecies.
Conservation Measures: (1) Protection and restoration of pesticide- and lead-free grassland and wetland communities and associated forest, woodland, and thorn scrub. (2) Restrict access to known or suspected nesting areas. (3) Avoid any practice that removes ground water or causes drying of surface water in the immediate area occupied by the species.
References: U.S. Fish and Wildlife - Aplomado Falcon Recovery Plan 1990. Department of Defense and Department of Interior Fact Sheet: Northern Aplomado Falcon (*Falco femoralis septentrionalis*) July 2007. Keddy-Hector, Dean P. 2000. Aplomado Falcon (*Falco femoralis*), and The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/bna/species/549

Taxon: Snails
Common Name: Assiminea *pecos*
Scientific Name: *Assiminea pecos*
Federal Status: Endangered
Threats: The loss or alteration of spring habitat continues to be the main threat with potential failure of spring flow due to excessive groundwater pumping or drought or both, which would result in total habitat loss for the species. Fire suppression is largely restricted to established roads due to the safety hazards of transporting equipment over karst terrain, which severely limits the ability to quickly suppress fires that threaten fragile aquatic habitats. Springsnails and amphipods are a food source for other aquatic animals, such as crayfish, fish, and aquatic snails. Seeps and springs currently occupied have been perennial, even during times of drought, suggesting that these springs are relatively resilient to drought. However, climate change may test that resiliency.
Conservation Measures: (1) Secure conservation on additional lands surrounding occupied habitat to protect water quality and improve land management practices. (2) Restrict access to occupied habitat. (3) Avoid use of prescribed burning to control invasive vegetation. (4) Avoid any practice that removes ground water or causes drying of surface water in the immediate area occupied by the species.
References: U.S. Fish and Wildlife Service - Four Bitter Lake Invertebrates 5-Year Review, December 28, 2010

Taxon: Fishes
Common Name: Pecos Bluntnose Shiner
Scientific Name: *Notropis simus pecosensis*
Federal Status: Threatened
Threats: Reduced flow and associated altered riparian habitats and hydrographs remain the primary threats to the species. Dams have many downstream effects, including habitat fragmentation, a reduction in lateral channel migration, channel scouring, blockage of fish passage, channel narrowing, changes in the riparian community, diminished peak flows, changes in the timing of high and low flows, and a loss of connectivity between the river and its flood plain. Aerial and terrestrial piscivores may also threaten the species. The spread golden algae, the increased potential for drought, salinization, and nutrient concentrations over time are reasons for concern.
Conservation Measure: The highest priority to facilitate recovery for the Pecos bluntnose shiner is maintaining a continuous river flow from the confluence of Taiban Creek to Brantley Reservoir and to continue habitat restoration projects that create favorable habitat for Pecos bluntnose shiner.
References: U.S. Fish and Wildlife Service - Pecos Bluntnose Shiner (*Notropis simus pecosensis*) 5-Year Review Summary and Evaluation – May 2010

Taxon: Fishes
Common Name: Pecos Gambusia
Scientific Name: *Gambusia nobilis*
Federal Status: Endangered
Threats: The species is facing extinction because of one or both of two major threats: (1) Loss of habitat and (2) the inability to interact successfully with nonnative fish species, especially mosquitofish. The species has become confined to spring-fed areas because it cannot compete with fish species nonnative to its habitat. Loss of habitat has occurred through water withdrawals for irrigation and dam construction. A total of five major dams and at least three lesser dams are on the mainstream Pecos River.
Conservation Measure: Avoid any practice that removes ground water or causes drying of surface water in the immediate area occupied by the species.
References: U.S. Fish and Wildlife Service - Pecos Gambusia Recovery Plan 1983

Taxon: Plants
Common Name: Pecos Sunflower
Scientific Name: *Helianthus paradoxus*
Federal Status: Threatened
Threats: Loss and/or alteration of wetland habitat are the primary threat to Pecos sunflower, primarily by surface water diversion and wetland filling for agriculture and recreational uses, and groundwater pumping and aquifer depletion for municipal uses. In addition, the species is

potentially out competed by nonnative invasive vegetation (tamarisk), and impacted by land management activities (unsuitable grazing systems, mowing, etc.).
Conservation Measures: (1) Groundwater use in the surrounding area should be managed in a way to assure adequate spring flows. (2) When developing a grazing system in occupied habitat, ensure grazing season, frequency, intensity and duration will provide the conservation of the species.
References: U.S. Fish and Wildlife Service - Pecos Sunflower (*Helianthus paradoxus*) September 2005. U.S. Fish and Wildlife Service - Pecos_Sunflower_FINAL_Recovery_Plan_Fact_Sheet.pdf

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Taxon: Birds
Common Name: Piping Plover
Scientific Name: *Charadrius melodus*
Federal Status: Endangered, Threatened
Threats: Reservoirs, channelization of rivers, and modification of river flows may result in reduction in sandbar riverine habitat, the flooding of remaining breeding habitat during the nesting season, and vegetation growth on sandbars that are rarely scoured by high flows. Other threats include commercial sand and gravel mining, freshening of alkali lakes, invasive exotics, particularly salt cedar, and even native species that are declining overall along channelized rivers, because flows are rarely sufficient to scour them from riverine islands. Oil spills in the wintering range may be a threat, but it does not address the potential impacts of oil and gas development on the breeding grounds. Oil development on the breeding grounds has increased dramatically since the 1988 and remains a threat today. The potential impacts of wind farms on piping plovers are unknown but may be significant. Impacts may occur through direct collision with turbines, or indirectly if plovers avoid previously used areas that now contain wind farms.
Conservation Measures: (1) Create, manage, or protect nesting and foraging habitats (relatively barren, unvegetated salt flats, river sandbars and islands). (2) Land use practices that may adversely affect stream flows, channel morphology, and sediment transport should be avoided. (3) Protect nesting and rearing habitats from human disturbance. (4) Exclude livestock from streams. (5) Control salt cedar and other non-native vegetation. (6) Identify areas infested by saltcedar or Russian olive and assess which conservation measures would be the most practical and effective for restoring historic levels of base flows. (6) Reduce perch sites and habitat for potential predators.
References: U.S. Fish and Wildlife Service - Piping Plover 5-Year Review, September 2009. Kevin Stubbs, Fish and Wildlife Biologist, US Fish & Wildlife Service, and Pompei V.D. and F.J. Cuthbert. 2007. Spring and Fall Distribution of Piping Plovers in North America: Implications for Migration Stopover Conservation. University of Minnesota. St. Paul, Minnesota. 28 p.

Taxon: Fishes
Common Name: Rio Grande Silvery Minnow
Scientific Name: *Hybognathus amarus*

Federal Status: Endangered, Endangered Experimental Population
Threats: Silvery minnow's decline has been attributed to decreased and interrupted stream flows caused by impoundments, water diversion for agriculture, and stream channelization. It may also be affected by interactions with non-native fish and decreasing water quality in its native streams. It is believed that diversion dams on the middle Rio Grande act as barriers and prevent the silvery minnow from movement upstream of the diversion dams. Historically, after periods of low or no flow the silvery minnow may have been able to repopulate downstream habitat the following year by the drift of eggs from upstream populations. However, when the present-day middle Rio Grande dries and dams prevent upstream movement, the silvery minnow can become trapped in some areas and die in isolated pools before the river becomes wetted again. The inability of the population to find adequate refugia during prolonged periods of low or no flow and to repopulate extirpated reaches creates a very unstable population.
Conservation Measures: (1) Restore and protect the habitats used by the species. (2) Protect and expand existing populations by means of the following: strategic habitat modifications to provide proper habitat at low flows; new strategies to provide water needed by the species; habitat restoration activities; and a comprehensive program of propagation and augmentation. (3) Ensure that water withdrawals will not reduce quality of aquatic or riparian habitat.
References: U.S. Fish and Wildlife Service - Rio Grande Silvery Minnow Questions and Answers April 2002

Taxon: Snails
Common Name: Roswell Springsnail
Scientific Name: *Pyrgulopsis roswellensis*
Federal Status: Endangered
Threats: The loss or alteration of spring habitat continues to be the main threat with potential failure of spring flow due to excessive groundwater pumping or drought or both, which would result in total habitat loss for the species. Water contamination, particularly from oil and gas operations, is a significant threat. Fire suppression is largely restricted to established roads due to the safety hazards of transporting equipment over karst terrain, which severely limits the ability to quickly suppress fires that threaten fragile aquatic habitats. Springsnails and amphipods are a food source for other aquatic animals, such as crayfish, fish, and aquatic snails. Seeps and springs currently occupied have been perennial, even during times of drought, suggesting that these springs are relatively resilient to drought. However, climate change may test that resiliency.
Conservation Measures: (1) Secure conservation on additional lands surrounding occupied habitat to protect water quality and improve land management practices. (2) Restrict access to occupied habitat. (3) Avoid use of prescribed burning to control invasive vegetation. (4) Avoid any practice that removes ground water or causes drying of surface water in the immediate area occupied by the species.
References: U.S. Fish and Wildlife Service - Four Bitter Lake Invertebrates 5-Year Review, December 28, 2010

Taxon: Birds
Common Name: Southwestern Willow Flycatcher
Scientific Name: *Empidonax traillii extimus*
Federal Status: Endangered
Threats: The reasons for the decline of the southwestern willow flycatcher and current threats it faces are numerous, complex, and inter-related. Riparian ecosystems have declined from reductions in water flow, interruptions in natural hydrological events and cycles, physical modifications to streams, modification of native plant communities by invasion of exotic species, and direct removal of riparian vegetation. Habitat has been lost to fire, agricultural development, and urbanization. Unsuitable livestock grazing and recreation are also continuing threats (direct impacts to individuals as well as changes to habitat).
Conservation Measures: (1) Protection, manage and restore riparian habitat. (2) Remove livestock from the riparian areas to enhance riparian habitat and prevent destruction of nests (although some light to moderate grazing during the winter in riparian areas is acceptable) and (3) Restrict human access to habitat during the breeding season.
References: U.S. Fish and Wildlife Service -Final Recovery Plan Southwestern Willow Flycatcher (*Empidonax traillii extimus*) – August 2002

Taxon: Clams
Common Name: Texas Hornshell
Scientific Name: *Popenaias popeii*
Federal Status: Candidate
Threats: The decline in freshwater mussel populations in New Mexico and Texas, including the Texas hornshell, can be directly attributed to human actions that modify physical conditions in streams, such as dams, water impoundment and diversion, certain flood control practices, water pollution, increased siltation and sedimentation, and climate change. The release of pollutants into streams from point and non-point sources has immediate impacts on water quality. Oil and gas industry operations (exploration, transfer, storage, and refining) are known to contaminate ground- and surface-waters. The potential effects of future climate change could reduce overall water availability and compound the threat of declining flows. Introduction of exotic bivalves and water soluble toxins produced by the invasive golden alga are also a threat.
Conservation Measures: (1) To avoid impacts to the species, ensure that water withdrawals will not reduce quality of aquatic or riparian habitat. (2) Restrict access to Texas hornshell beds.
References: U.S. Fish and Wildlife Service – Species Assessment and Listing Priority Form - Texas Hornshell – October 22, 2010

Taxon: Birds
Common Name: Whooping Crane
Scientific Name: *Grus americana*
Federal Status: Endangered
Threats: Ongoing and anticipated development of wind resources in the migration corridor of the AWBP is unprecedented and could place thousands more wind turbines, associated

transmission lines, and other appurtenances in the Central Flyway path of the species in the coming decade. The whooping crane is a species with a low reproductive rate and limited genetic material derived from the 15 whooping cranes that remained in the 1940s. As more wind energy facilities are built, including turbines, transmission lines, power stations, and roads, it is incumbent on the industry, Federal action agencies, and U.S. Fish and Wildlife Service to provide the highest level of protection possible to whooping cranes, and to closely monitor the number of these birds killed and deterred from using preferred stopover locations. Other major threats to whooping cranes in the wild are the potential of a hurricane or contaminant spill destroying their wintering habitat on the Texas coast. The primary threats to captive birds are disease and parasites.

Conservation Measures: (1)To conserve whooping cranes, limit activity within 0.5-miles of wetlands suitable as stopover sites during spring and fall migration periods. To determine what suitable whooping crane habitat is, look for shallow wetlands in open, non-wooded areas free from human disturbance, such as nearby roads or buildings with at least some water area less than 18 inches deep. This will include marshes, small ponds, lake edges, or rivers. (2) Avoid any practice that removes ground water or causes drying of surface water in the immediate area of possible stopover sites. Note: other LPCI practices that may be beneficial to the whooping crane include watering facilities to provide livestock with reliable water resources outside of stopover sites, planting, and pond development.

References: Whooping Cranes and Wind Development – An Issue Paper – By Regions 2 and 6, U. S. Fish and Wildlife Service – December 2008. Also
http://www.fws.gov/northflorida/WhoopingCrane/whoopingcrane-fact-2001.htm

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Taxon: Plants
Common Name: Wright's Marsh Thistle
Scientific Name: *Cirsium wrightii*
Federal Status: Candidate

Threats: *Cirsium wrightii* faces threats primarily from natural and human-caused modifications of its habitat due to ground and surface water depletion, drought, invasion of *Phragmites australis*, and from the inadequacy of existing regulatory mechanisms. The species occupies relatively small areas of seeps, springs, and wetland habitat in an arid region plagued by drought and ongoing and future water withdrawals. The species' highly specific requirements of saturated soils with surface or subsurface water flow make it particularly vulnerable. Long-term drought, in combination with ground and surface water withdrawal, pose a current and future threat to *C. wrightii* and its habitat.

Conservation Measures: (1) To conserve this species, grazing exclosures could be built in riparian areas to support protection and expansion of extant populations. (2) Avoid any practice that removes ground water or causes drying of surface water in the immediate area occupied by the species particularly the springs and cienagas in southeastern New Mexico.

References:
http://www.fws.gov/southwest/es/arizona/Documents/SpeciesDocs/WrightsThistle/FR_12-month_Wright's_marsh_thistle.pdf

APPENDIX VI – NRCS Planning Tools: Environmental Evaluation Worksheet (NRCS-CPA-52)

U.S. Department of Agriculture NRCS-CPA-52 Natural Resources Conservation Service 10-03 **Environmental Evaluation Worksheet**	**A.** Client:	
	B. Plan ID No:	
	C. CMU/Fields:	
	D. Client's objective	**E.** Purpose and need for action

F. Resource Considerations	**H.** Alternatives and Effects (Attach additional pages as necessary)			
	Proposed Action	No Action	Alt 1	Alt 2
SOIL				
Erosion				
Condition				
Deposition				
WATER				
Quantity				
Quality				
AIR				
Quality				
Condition				
PLANT				
Suitability				
Condition				
Management				
ANIMAL				
Habitat				
Management				

G. Economic and Social Considerations	**I.** Effects			
	Proposed Action	No Action	Alt 1	Alt 2
Land use				
Capital				
Labor				
Management level				
Profitability				
Risk				

J. Special Environmental Concerns (See "Evaluation Procedure Guide Sheets")	**K. Effects: Not Applicable (NA), Positive (+), Adverse/Potentially Adverse (--), Neutral (0)**			
	Proposed Action	No Action	Alt 1	Alt 2
NRCS ENVIRONMENTAL COMPLIANCE HANDBOOK (NECH).				
CLEAN WATER				

ACT/WATERS of U.S.				
***COASTAL ZONE MANAGEMENTAREAS**				
***CULTURAL RESOURCES** Filling out CPA-052 for NEPA				
***ENDANGERED THREATENED SPECIES** eFOTG Section II				
ENVIRONMENTAL JUSTICE Executive Order				
***FISH AND WILDLIFE COORDINATION** (Stream channelization, impoundment etc)				
FLOODPLAIN MANAGEMENT Executive Order 11988				
INVASIVE SPECIES Executive Order 13112				
MIGRATORY BIRDS Executive Order 13186				
NATURAL AREAS National Natural Landmarks				
PRIME and UNIQUE FARMLANDS				
RIPARIAN AREAS				
SCENIC BEAUTY				
WETLANDS				
***WILD and SCENIC RIVERS** Minnesota				

* These items may require consultation or coordination between the lead agency/RFO and another governmental unit.

L. Easements, permissions, or permits.

_____

_____

M. Mitigation

_____

_____

_____

_____

N. The information recorded above is based on the best available information:

_____ _____ _____

Signature Title Date

O. Agencies, persons, and references consulted

P. Findings. Indicate which of the alternatives from Section H is the preferred alternative.

I have considered the effects of this action and the alternatives on the Resource, Economic, and Social Considerations; the Special Environmental Concerns; and the extraordinary circumstances criteria in the instructions for form NRCS-CPA-52. I find, for the reasons stated in (Q) below, that the selected alternative:

_____ is **not a Federal action** (NA, +, 0). No additional analysis is required.

_____ is **categorically excluded** from further environmental analysis and there are no extraordinary circumstances (see instructions). No additional analysis is required.

_____ has been **sufficiently analyzed** in an existing NRCS environmental document. No additional analysis is required.

_____ may require preparation of an EA or EIS or formal consultation with another governmental unit (--). The action will be referred to the State Office.

Q. Rationale supporting the finding

R. _____ _____ _____

Signature Title Date

Instructions for Completing Form NRCS-CPA-52, "Environmental Evaluation Worksheet"

The form NRCS-CPA-52 is the instrument used to summarize the effects of conservation practices and systems. It also provides summary documentation of the environmental evaluation (EE) of the planned actions. The EE is "a concurrent part of the planning process in which the potential long-term and short-term impacts of an action on people, their physical surroundings, and nature are evaluated and alternative actions explored". The EE applies to all assistance provided by NRCS (GM190 Part 410.5). The following are instructions for completing form **NRCS-CPA-52**:

A Record the client's name.

B Enter the conservation plan identification number.

C Enter the conservation management unit to which this evaluation applies. This may be done by field, pasture, tract, landuse (i.e. cropland, rangeland, woodland etc.), by resource area (i.e. riparian corridor or wetland area) or any other suitable geographic division.

D Briefly summarize the client's objective(s).

E Briefly identify the purpose and need for action. Reference the resource concern(s) to be addressed.

F, G Use the provided resource, economic, and social considerations or list considerations identified during scoping or by any existing area wide, watershed or other resource document appropriate for the planning area. The list of considerations may be expanded by listing subcategories, such as wind erosion, sheet erosion, gully erosion etc. Refer to the applicable quality criteria.

H, I Briefly summarize the practice/system of practices being proposed, as well as any alternatives being considered. Document the effects of the proposed action for the considerations listed in E and F. Reference applicable quality criteria, information in the CPPE, and quantify effects whenever possible. Consider both long-term and short-term effects. Consider any effects which may be individually minor but cumulatively significant at a larger scale or over an extended time period. At the request of the client, additional alternatives may be developed and their effects evaluated. This may be done in order to more fully inform the client about the decision to be made. In these cases, briefly describe alternatives to the proposed action, including the "no action" alternative. The no action alternative is the predicted future condition if no action is taken. Clearly define the differences between proposed action, no action, and the other alternatives if applicable.

J, K See the Special Environmental Concerns Evaluation Procedure Guide Sheets. Completion of Help Sheets is not required, but may provide additional documentation that the appropriate processes have been followed. Complete section J by documenting the effects of each alternative on the special environmental concerns listed in I. Quantify effects whenever possible. Consider both long-term and short-term effects. Consider any effects, which may be individually minor but cumulatively significant at a larger scale or over an extended time period. Indicate whether the practice affect will be; Positive (+), Neutral (0), or Adverse/ Potentially Adverse (--).

L List any necessary easements, permissions, or permits (i.e. 404, ESA section 10, State or county permits or requirements).

M Describe mitigation to be applied that will offset any adverse impacts. Attach documentation from other agencies.

N The individual responsible for completing the CPA-52 must sign and date the Form indicating they have used the best available information. This signature is particularly important when a TSP is completing the CPA-52 or when NRCS is providing technical assistance on behalf of another agency.

O Document contact and communications with USFWS, NOAA Fisheries, COE, EPA, NRCS State Biologist, State Environmental Agencies, or any others consulted. Include public participation activities, if applicable.

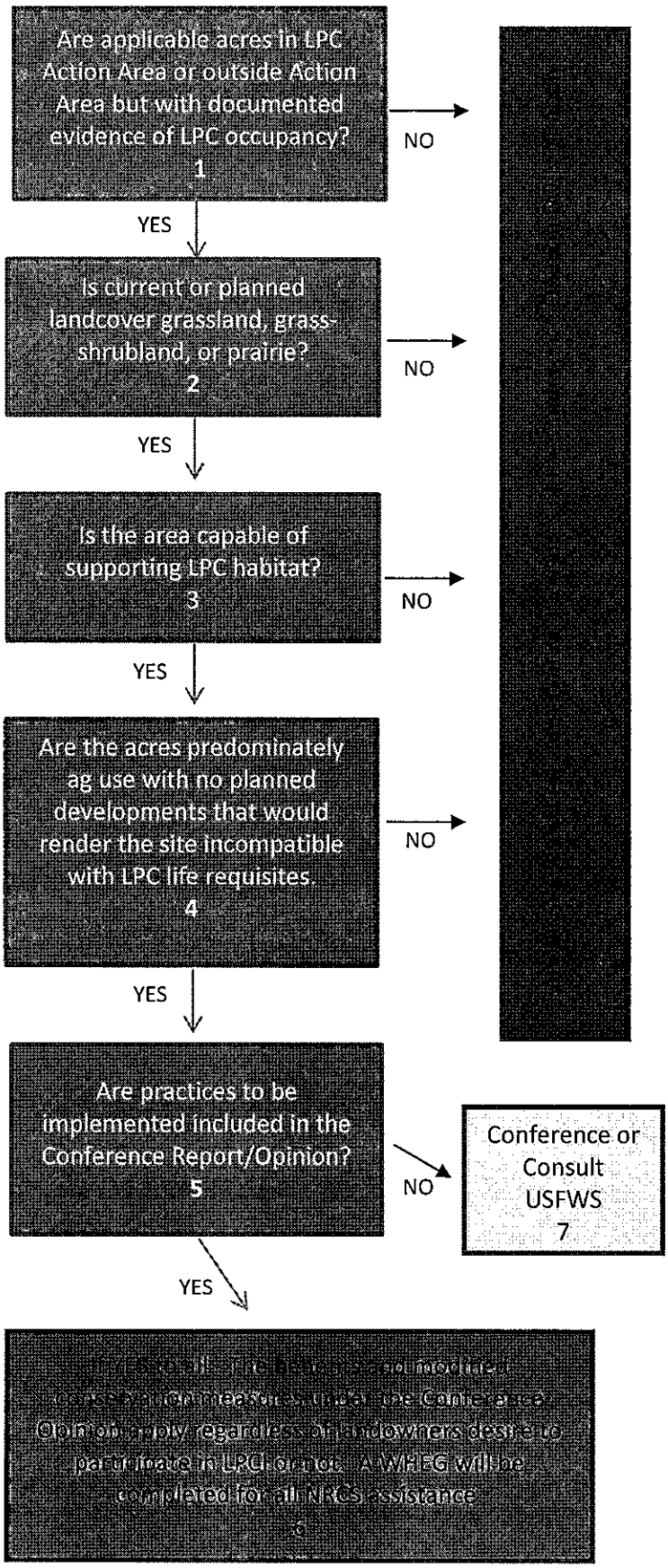
P Check the applicable finding being made.

The practice is **not a Federal action** if all effects are Positive (+), Not Applicable (NA) or Neutral (0).
The practice **may require preparation of an EA, EIS or require formal consultation with another governmental unit** if any effect is Adverse/Potentially Adverse (--).

Q Explain the reasons for making the finding identified in P. Cite any references, analysis, data, or documents which support the finding. Add additional pages as necessary. To find that an action has been sufficiently analyzed in an existing NRCS environmental document, the document must cover the area in which the action is being implemented.

R NRCS responsible official must sign and date for NRCS actions. The FSA or other Federal agency responsible official must sign and date for FSA or other agency funded activities.
CRITERIA FOR IDENTIFYING
CATEGORICAL EXCLUSIONS AND
EXTRAORDINARY CIRCUMSTANCES
NRCS Categorical Exclusions
1. Soil Survey
2. Snow Survey and Water Supply Forecasts
3. Plant Materials for Conservation
4. Inventory and Monitoring
5. River Basin Studies under Section 6 of Public Law (PL) 83–566 as amended
Extraordinary circumstances usually involve impacts on environmental concerns such as wetlands, floodplains, or cultural resources. The circumstances that may lead to a determination of extraordinary circumstances are the same factors used to make determinations of significance and include
1. Impacts that may be both beneficial and adverse and that significantly affect the quality of the human environment.
2. The degree to which the proposed action affects public health or safety.
3. Unique characteristics of the area, such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.
4. The degree to which the effects on the quality of the human environment are likely to be controversial.
5. The degree to which the possible effects on the quality of the human environment are highly uncertain or involve unique or unknown risks.
6. The degree to which the action may establish a precedent for future actions with significant effects or represent a decision in principle about a future consideration.
7. Individually insignificant but cumulatively significant activities that have not been analyzed on a broader level, such as on a program-wide or priority area basis.
8. Adverse effects on areas listed in or eligible for listing in the National Register of Historic Places, or that may result in loss or destruction of significant scientific, cultural, or historical resources.
9. Adverse effects on an endangered or threatened species or its designated critical habitat.
10. Circumstances threatening the violation of Federal, State or local law or requirements imposed for the protection of the environment.
If one or more extraordinary circumstances are found to apply to the proposed action, determine whether the proposal can be modified to mitigate the adverse effects and prevent the extraordinary circumstances. If this can be done and the client agrees to the change, then the proposed action may be modified and categorically excluded. If the proposed action cannot be modified or the client refuses to accept a proposed change, prepare an EA or EIS as indicated above.
If none of the extraordinary circumstances are determined to apply to the proposed action (or modified action), then it may be categorically excluded. Document the rationale for the determination in Q.

APPENDIX VII. Flow chart demonstrating when measures and benefits of LPCI Conference Opinion would apply



Evaluation Criteria to determine when the predictability and conservation measures of the LPCI Conference Opinion are applied to NRCS assistance	
☐ **YES** ☐ **NO**	Box 1.
☐ **YES** ☐ **NO**	Box 2.
☐ **YES** ☐ **NO**	Box 3.
☐ **YES** ☐ **NO**	Box 4.
☐ **YES** ☐ **NO**	Box 5.
☐ **YES** ☐ **NO**	Box 6.
☐ **YES** ☐ **No**	Box 7.

Date: _____

Compiled by: _____

Use of this flow chart is recommended for all NRCS assistance (TA and FA) within the Action Area as defined by the Conference Report/Opinion or any area outside the Action Area where there is documented Lesser Prairie-chicken activity or occupation. A completed flow chart can serve as NRCS documentation of LPC habitat and the need to follow the associated conservation measures of the Conference Report/Opinion in order to provide the assisted producer the regulatory predictability provided through this document. For any assistance provided where the end result of this flow chart ends up in the green box shall be completed with a properly completed Wildlife Habitat Evaluation Guide (WHEG) for the proper associated habitat type. A situation which ends up in the red box can serve as NRCS documentation the proposed assistance has no potential to affect the LPC. A copy of this completed flow chart shall remain in the producers conservation case file as proper documentation of the decision reached. Should a field office choose other methods for documenting their decisions that documentation shall be retained in the producers case file.

Please check the correct yes or no box for each numbered box based on the local field conditions. Document the evidence utilized to reach your decision in the associated numbered box – additional sheets/photos/etc. may be attached supporting your conclusions.

The following guidance is provided to assist field staff with completion of this flow chart. The examples associated with each box are provided as possible sources of documentation and items to consider when completing the flow chart. These are not all inclusive but are provided for use by field staff as possible considerations. These and other considerations may be utilized where appropriate. It is important a third party can look at your completed flow chart/documentation and ascertain how your reached your final conclusion.

Box 1 – Evidence of LPC occupancy may include (but is not limited to) documentation from state Fish and Wildlife agency, sighting by a reputable source including the land owner/operator, or physical evidence of LPC use within the last three years.

Box 2 – Current land cover percentages/dispersal. Planned land cover if restoring habitat or changing land use.
CRP plant cover may be providing LPC habitat/use even if a monoculture or species not normally associated with LPC habitat use.
If changing land use from grassland or prairie to non-grassland or prairie, and the conversion is not covered under any other programmatic conferencing, individual conferencing must be initiated. If an NRCS action NRCS shall initiate conferencing with permission of landowner.

Box 3 – Consider:
Size of habitat unit being considered, including adjacent habitats. Consider composition of landuse in the area, will the size and landscape position of the evaluated area provide necessary habitat in relationship to adjacent habitats.
Fragmentation of habitat unit. Is there permanent or long standing fragmentation present?
Soils – is the site capable of supporting LPC habitat. Is it an ESD (or range site) determined as an important LPC habitat type.

There is some planner interpretation necessary in this step and detailed documentation is critical to decisions. Provide a detailed justification of why you made a decision.

Box 4 – Other extenuating circumstances which could preclude habitat considerations such as construction of wind energy/transmission power lines/development. Consider development which would cause fragmentation to the point habitat becomes incompatible with LPC use. Considerations should be situations which are impending based on planner knowledge. The intent is not to consider possible scenarios which are not currently in place to be implemented. Again, provide documentation of circumstances considered.

Box 5 – If this box is reached and the practices are not included in the conference report/opinion there is a potential to affect and NRCS must initiate an individual conference with the USFWS with the permission of the landowner.

Box 6 – If this box is reached all NRCS assistance must include completion of the Wildlife Habitat Evaluation Guide (WHEG) and all conservation measures in the opinion shall be followed. For assistance through the LPCI the most limiting factor identified in the WHEG must be addressed initially. For all other assistance the WHEG shall serve as a tool to provide planning considerations.

Box 7 – Consultation will be initiated by NRCS, with written permission of the landowner, for any NRCS financial assistance program. For technical assistance only we are not required to consult. The Farm Service Agency (FSA) is responsible for conferencing on CRP contracted land.

Appendix VIII – Letter from USFWS describing conditions for providing 30-year predictability under Working Lands for Wildlife

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Washington, D.C. 20240

AUG - 3 2012

In Reply Refer To:
FWS/AES/52307

Mr. Dave White
Chief, Natural Resources Conservation Service
1400 Independence Ave., SW, Room 5105-A
Washington, DC 20250

Dear Dave:

Thank you for your letter dated August 2, 2012 about the Working Lands for Wildlife (WLFW) partnership, which is successfully leveraging the capabilities and resources of our two agencies. We greatly appreciate the collaboration between the Natural Resources Conservation Service (NRCS) and U.S. Fish and Wildlife Service (Service) staff, and the leadership that you have shown to strategically target funding for working lands and sensitive species. This effort clearly demonstrates that productive working rural lands are compatible with the needs of wildlife and their habitats, achieving the missions of both NRCS and the Service.

The purpose of this letter is to describe the Service's approach to candidate conservation under the Endangered Species Act (ESA) and predictability for landowners who participate in WLFW. As referenced in your letter, the Service has recently completed conference opinions for three of the four candidate species involved in WLFW, including lesser prairie chicken, the eastern portion of the gopher tortoise's range, and New England cottontail. In addition, the Service had previously completed an effective conference report for the greater sage grouse, the fourth candidate species involved in WLFW. In these documents, the Service analyzed the effects to these species from the implementation of specific conservation practices by landowners who choose to participate in WLFW. These conservation practices and associated conservation measures were developed in partnership by our agencies to benefit the species and their habitats and be fully compatible with working lands.

The Service will be determining in the future whether to list each of these candidate species as threatened or endangered under the ESA. In the event that any of the species are listed, the Service is committed to validating the conference report and opinions as biological opinions for NRCS under section 7 of the ESA, and exempting any incidental take as described in the biological opinions associated with implementing the specified conservation practices. As a result, the predictability for landowners is clear. They will know that the conservation practices will continue to benefit wildlife for as long as they are implemented, and that any ESA issues associated with their implementation have been already addressed in full.

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You also asked how we might encourage landowners to continue to implement these beneficial conservation practices beyond the term of their program contract with NRCS. The Service also recognizes the value of landowners voluntarily choosing to continue implementing the conservation practices after each individual program contract with NRCS under WLFW ends. These contracts can extend from one to fifteen years in length, depending on the species involved and the conservation practices employed. Continuing the implementation of the conservation practices beyond this period would advance the longer-term goals of WLFW and both agencies' missions.

Should any of the candidate species in WLFW be listed in the future, the Service intends to exempt through section 7 any incidental take that is anticipated to occur from the implementation of the conservation practices if a landowner with a WLFW program contract voluntarily chooses to continue implementing the practices after the program contract ends. The Service will review the effects of implementing the specified conservation practices to these species over a 30-year period and exempt any incidental take anticipated to occur from their implementation. Each landowner involved in WLFW will have the sole discretion whether or not to continue implementing the conservation practices at the end of the contract with NRCS. If a landowner chooses, however, to continue implementing the conservation practices defined through our WLFW partnership, they will have predictability and the confidence in knowing that any ESA issues associated with their implementation over a 30-year period will have already been addressed in full. By taking this step, the Service hopes to encourage the long-term implementation of the conservation practices and associated conservation measures.

The Service also notes that two other species included in WLFW are already listed under the ESA, the Southwest willow flycatcher and the bog turtle. For these two species, the Service has completed biological opinions and exempted any incidental take anticipated in the biological opinions to occur from implementation of the conservation practices. In addition, the western portion of the gopher tortoise's range is currently listed (the eastern portion of the range is currently a candidate species as noted above), and the Service has completed a biological opinion and exempted any incidental take anticipated in the biological opinion to occur from implementation of the practices in this portion of the range. Furthermore, the golden-winged warbler is also included in WLFW. This species is neither currently listed under the ESA nor a candidate species for listing. Should the species status change in the future and the potential need for listing be considered, the Service intends to follow the same approach to ESA predictability for NRCS and landowners that has been used for the other species in WLFW.

As WLFW moves forward, we will have the opportunity to gauge the success of the conservation practices over time, and potentially gain information that will allow us to refine them and achieve even better results for landowners, NRCS, and the Service. The Service is committed to this approach of learning and adaptive management in partnership with NRCS and the landowners participating in WLFW. Any refinements to the conservation practices would be developed in full collaboration with NRCS, using information gained from on-the-ground implementation of WLFW.

The Service is also committed to developing more tools for landowners. We are particularly interested in pursuing partnerships using Candidate Conservation Agreements with Assurances with landowners, which can provide long term conservation options and regulatory certainty.

Thank you again for your leadership in working lands conservation. If you have any questions, please contact Gary Frazer, Assistant Director for Endangered Species, at (202) 208-4646.

Sincerely,

DIRECTOR

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

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

Introduction

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

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

Challenges to Lesser Prairie-Chicken Conservation

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

Second, there is a high degree of habitat fragmentation within occupied habitat patches and across the entirety of the species' historical range. Habitat fragmentation occurs when some form of disturbance, usually habitat alteration or loss, results in the separation or splitting apart of larger, previously contiguous, functional components of habitat into smaller, often less valuable, non-contiguous parcels (Wilcove *et al.* 1986, p. 237; Johnson and Igl 2001, p. 25; Franklin *et al.* 2002, entire). Lesser prairie-chickens are impacted by habitat fragmentation and

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

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

Management Recommendations for Lesser Prairie-Chicken Conservation

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

Strongholds

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

What Constitutes a Lesser Prairie-Chicken Stronghold?

The components of a stronghold must be defined within the context of a short-term conservation strategy stipulating immediate needs. As stated above, the Service recommends the prompt establishment of at least four strongholds distributed across the landscape as informed by population goals in order to reduce the risk of extinction in the short term. The establishment of

lesser prairie-chicken strongholds requires spatial consideration, temporal consideration, adequate jurisdiction, biological security, and management certainty.

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

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

A stronghold must also be secure in its biological function due to the lesser prairie-chickens' lek mating system. Leks are characterized by sparse vegetation and are generally located on elevated features such as ridges or grassy knolls (Giesen 1998, p. 4). Giesen (1998, p. 9) reported that hens typically nest and rear broods within 3 km (1.7 mi) of leks and nest near a lek

other than the one on which they mated. Therefore, a stronghold must provide a variety of habitat components to serve its biological function. Lastly, an area will not constitute a stronghold unless there is a high level of certainty that the quantity and quality of the habitat within the site will be maintained or improved.

Connectivity

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

Implementation

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

Certainty

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

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

Moving Forward with Lesser Prairie-Chicken Conservation

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

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

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