LESSER PRAIRIE CHICKEN

CRUDE OIL AND NATURAL GAS DEVELOPMENT

BEST PRACTICES FOR OKLAHOMA

INTRODUCTION

In Oklahoma, the Lesser Prairie Chicken (LEPC) and its habitat are located in areas where oil and gas (O&G) development is occurring. The U.S. Fish and Wildlife (USFWS) has determined that listing the LEPC as threatened under the Endangered Species Act (ESA) is warranted but precluded because of other higher priority species and has designated the LEPC as a candidate for listing. Recently, the USFWS released a proposed listing rule to list the LEPC as threatened, based on the five listing factors identified in the ESA which include: the present or threatened destruction, modification, or curtailment of habitat range; overutilization for commercial, recreational, scientific, or education purposes; disease or predation; the inadequacy of existing regulatory mechanisms; and other natural or manmade factors. To address the conservation needs of the LEPC, and to potentially preclude or remove any need to list the LEPC based on these factors, representatives from the O&G industry and the Oklahoma Department of Wildlife Conservation (ODWC) began a dialogue that included an exchange of information on the LEPC as well as O&G operations.

A number of meetings were held, and the parties agreed that the first step should be to develop Best Management Practices (BMP) that O&G operators could immediately implement to reduce or eliminate impacts to the LEPC. The need to develop O&G BMP's was also identified as a crucial conservation action in the recently completed Oklahoma Lesser Prairie Chicken Conservation Plan. This document is the result of those ongoing efforts.

PURPOSE

The purpose of this document is to identify BMP's that O&G operators can adopt to avoid or minimize potential impacts to the LEPC in Oklahoma. These measures, if implemented, will help by reducing or eliminating impacts that the USFWS has identified as threats to the species, and may help preclude or remove any need to list the LEPC under the ESA. Furthermore, these BMP's are consistent with the ODWC's ongoing efforts to conserve, restore, and increase the number of LEPC and amount of LEPC habitat within Oklahoma.

SPECIES INFORMATION

The LEPC is a species of prairie grouse endemic to the southern high plains of the United States, and currently occupies a five-state range that includes portions of Texas, New Mexico, Oklahoma, Kansas and Colorado. In western Oklahoma, LEPCs use sand sagebrush-bluestem grasslands as well as shinnery oak-bluestem grasslands dominated by sand bluestem, little bluestem, and sand dropseed. The LEPC is commonly recognized for its feathered feet, stout build, ground-dwelling habit, and elaborate breeding behavior. Plumage of the LEPC is characterized by a cryptic pattern of alternating brown and buff-colored barring, with body length ranging from 15-16 inches. LEPCs require large tracts of relatively intact native grasslands and prairies to survive. LEPCs, particularly nesting hens, avoid vertical structures

because many vertical structures are often used as perches by predators such as hawks, eagles and owls. LEPCs also exhibit a lek mating system. Males gather to display on leks beginning in late February and extending through early May. After mating, the hen selects a nest site, usually 0.6 - 2 miles from a lek, and lays an average clutch of 10 - 14 eggs.

The USFWS has determined the LEPC faces a number of threats within its range including habitat loss, modification, degradation, and fragmentation. The USFWS attributes habitat loss, modification, degradation, and fragmentation to a number of factors including livestock grazing, alternative energy development, oil and gas development, transmission lines, roads and highways, and conversion of native rangeland to cropland or non-native vegetation. For more detailed information on the LEPC, go to http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0AZ#status.

O&G Best Management Practices

The following information provides BMP's that O&G operators can implement to avoid and/or minimize potential impacts to the LEPC during O&G exploration and production activities in western Oklahoma. As previously stated, these practices were developed in coordination with the ODWC and industry representatives. Operators should pre-plan O&G development in areas where the LEPC and its habitat are located and implement the following measures, as appropriate.

Pre-planning site construction and exploration

• If new drilling operations will be located in western Oklahoma, determine if operations will be located in LEPC high importance habitat (colors 4-8 as noted on ODWC's map in Appendix D) by using planning tools such as the Oklahoma Lesser Prairie-Chicken Spatial Planning Tool. In addition, the Southern Great Plains Crucial Habitat Assessment Tool (see Appendix B) is also available to use. If drilling operations will be located in LEPC high importance habitat, operators should contact ODWC's staff.

• If new drilling operations will occur in occupied habitat or near active leks, operators should contact ODWC's staff and implement alternatives to avoid or minimize impacts to the LEPC such as:

- Avoid all surface disturbances and development within a five (5) mile radius of known leks.
- Move the proposed well site to avoid disturbance of LEPC's breeding/nesting locations; or
- Avoid new O&G development between March 1 to July 1 to avoid disturbing the LEPC breeding/nesting time.
- When moving to a new location, cleaning vehicles and equipment to avoid any translocation of non-native seeds.

Site construction, exploration, production, and closure

In occupied or high importance LEPC habitat (colors 4-8 as noted on ODWC's map in Appendix D):

- Maximize the use of existing corridors for new infrastructure supporting new well development (e.g. roads, power lines, pipelines, flowlines, etc.) and combine multiple operations at one site (i.e. directional drilling) to minimize the disturbance / fragmentation of the LEPCs habitat.
- Minimize surface disturbance in order to decrease fragmentation.
    - Utilize frac water lines instead of constructing water pits
    - Spread down hole materials (i.e. mud) on agricultural land. Use closed loop system to recycle mud, if this will not result in an increased pad size, instead of constructing mud pits.
- Minimize the time needed to complete new construction and drilling operations, removing unnecessary equipment and infrastructure, and reclaiming all portions of well sites not needed for production operations and all portions of roads not needed for vehicle travel.
- Keep speeds at a minimum to reduce fugitive dust impacts on highly traveled gravel / dirt roads.
- Minimize detectability of structures in LEPC habitat.
    - Use low profile equipment near LEPC habitat.
    - Bury transmission lines, pipelines, well heads and flowlines.
    - Avoid placing equipment on ridgelines.
    - Choose paint that blends with natural surroundings.
- Avoid all activities (e.g. mud spreading) that would likely impact LEPC in nesting habitat (e.g little bluestem, sand sagerush, and shinnery oak).

- At well sites near active leks, avoid conducting early morning Activities (e.g. drilling, frac operations, well construction, etc.) between 5:00 am and 9:30 am during the mating season (March 1 to May 1).

- At well sites near active leks use noise control devices to muffle or control noise from facilities (pump jacks, brakes, compressors, etc.)
    - Not more than 85 dBA as measured at 50 feet.
    - Do not use horns, bells, or other noise making devices to announce shift changes.
    - Use electric engines instead of CNG or diesel engines.
        - Bury electrical transmission lines used for electric engines.
        - CNG or diesel engines must be equipped with hospital grade mufflers.

- All wastes will be containerized on-site.
    - Construct sufficiently impervious secondary containment (e.g. drip pans, containment dikes, etc.) around all qualifying equipment (i.e. tank batteries, chemical containers, and separating and treatment areas).
- Avoid constructing new fencing that is not associated with tank batteries or other equipment on Site. During construction of new fences limit the height of the top strand to below 40 inches, limit fencing to three strands, and install fence markers or other visually detectable avoidance mechanisms.

- Remediation practices
    - Practice interim reclamation (i.e. reshaping roads and well pads) to reduce the amount of bare ground during drilling operations.
        - Reclaim un-needed lease roads and other disturbed sites to be as close to native (pre-impact) state as possible after drilling operations are complete.
    - When reseeding disturbed areas in high importance habitat (colors 4-8 as noted on ODWC's map in Appendix C), use native grasses and forbs to promote natural habitat.
    - Remove all temporary equipment and infrastructure, from site as soon as possible. Keep site and associated access roads free from trash and debris at all times.

Appendix A

ODWC Staff Contacts for O&G Development

The principal contacts for O&G development are:

LEPC Issues:
Doug Schoeling
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Wildlife and Other Energy Issues:
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Appendix B

ODWC LPC Spatial Planning Tool

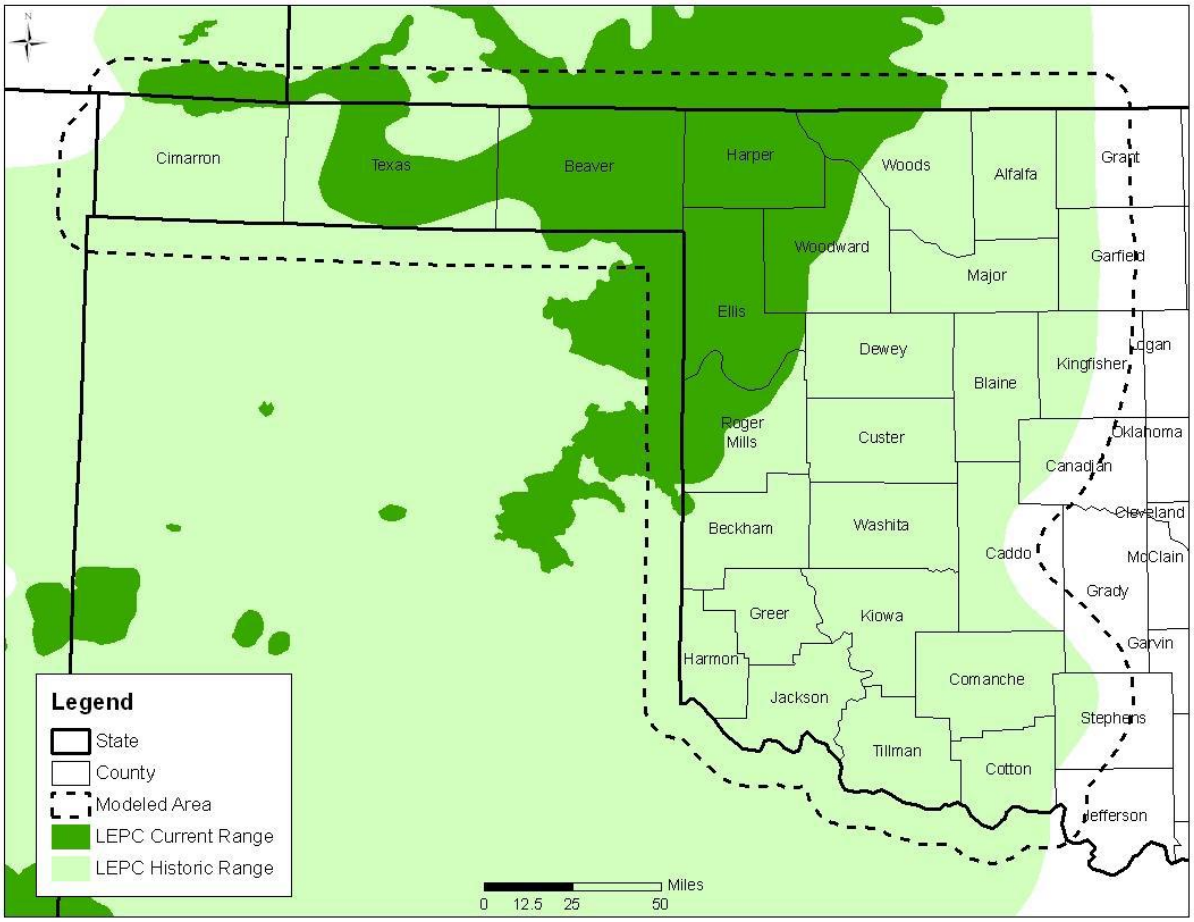
The Oklahoma Lesser Prairie-Chicken Spatial Planning Tool (OLEPCSPT 2010) is a spatially explicit model designed to assist development planning by avoiding, minimizing and mitigating negative effects of development on the lesser prairie-chicken in Oklahoma. The model and all associated products are specific to the lesser prairie-chicken and Oklahoma. The following is a web link to ODWC's LPC development planning webpage:
http://www.wildlifedepartment.com/lepcdevelopmentplanning.htm

The Southern Great Plains Crucial Habitat Assessment Tool (SGP CHAT) is another tool intended to provide useful information during the early planning stages of development projects, conservation opportunities, and environmental review. Developed by the Western Governors Association, the Southern Great Plains Crucial Habitat Assessment Tool is the result of phase one of a three-year WGA Wildlife Council project, led by the Oklahoma Department of Wildlife Conservation and the Kansas Department of Wildlife, Parks and Tourism. The SGP CHAT models LPC crucial habitat throughout its historical range create an online tool usable by conservation managers, industry, and the public that identifies priority habitat, including connecting corridors that can be used in the early stages of development or conservation planning.
The following is a web link to the SGP CHAT webpage: http://www.kars.ku.edu/maps/sgpchat/

Appendix C

LEPC in Oklahoma

LEPC Estimated Occupied Range
Source: ODWC LEPC Spatial Planning Tool info



Appendix D

ODWC LEPC Spatial Planning Tool

Relative Values of LEPC Habitat in Oklahoma

Source:

http://wildlifedepartment.com/spatial_planning/OK_LEPC_Model_Description_02222010.pdf