RENEWABLE ENERGY WILDLIFE | RESEARCH FUND

RESULTS SUMMARY

PUBLISHED APRIL 2025

Patterns in lek persistence and attendance by lesser prairie chicken *(Tympanuchus pallidicinctus)* near a wind energy facility in southern Kansas.

A study supported by the Renewable Energy Wildlife Research Fund (REWRF, the Fund) to monitor lesser prairie-chicken (LEPC) leks in the vicinity of wind turbines.

SUMMARY:

The lesser prairie-chicken (LEPC) is a ground-nesting, upland game bird that requires large tracts of undisturbed grass and shrubland habitat containing a high diversity of plant species. Due to range-wide habitat loss, LEPC are listed as threatened (northern population) and endangered (southern population) under the Endangered Species Act of 1973. Despite concerns about the role of wind energy development as a driver of habitat loss and fragmentation for LEPC, the scientific community's current understanding of the effects of wind energy development on LEPC population dynamics is based on a single study. Based on that study, effects of wind energy development on LPC movement and demographic rates are minimal when turbines are sited in cultivated cropland and grassland habitats are available nearby, but there are gaps in the overall understanding of how LPC populations respond to wind energy development over the long term. LEPC congregate at "leks" to perform courtship displays during the breeding season; this behavior provides a low-cost opportunity for long-term population monitoring. The research team conducted post-construction lek counts between 2017 and 2024 at the Cimmaron Bend Wind Resource Area (CBWRA) in southern Kansas, to evaluate trends in LPC lek persistence and attendance. This work builds on a telemetry-based study in the same area between 2017 and 2021.

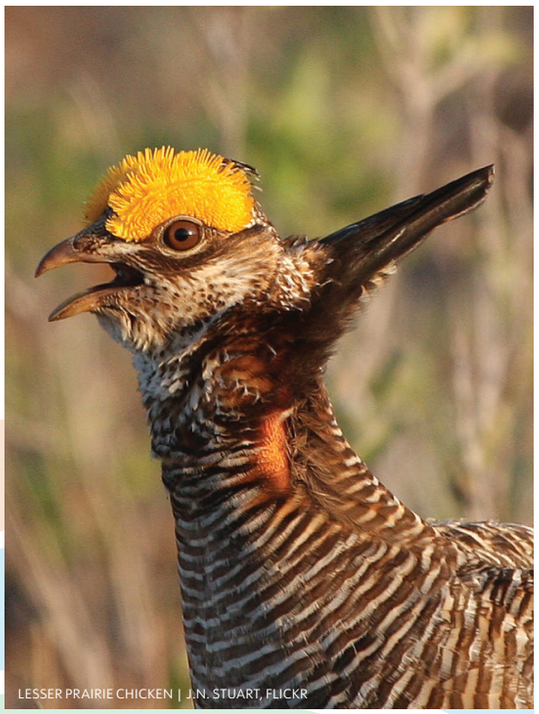
STUDY OBJECTIVES:

This study builds on prior work to investigate longer-term effects of wind energy development on LPCs. Objectives of this study were to:

1. Evaluate trends in lek attendance and persistence following the commissioning of a wind energy facility in 2020,
2. Determine if these trends can be explained by environmental characteristics, and
3. Compare findings on facility impacts to those of the antecedent study.

METHODS:

The research team conducted repeated, ground-based surveys in the early morning hours to record the location of leks, and number of individual LEPCs attending leks. This data along with environmental covariates identified in the prior telemetry study (LeBeau et al. 2023*a*) were used to model lek persistence and stability over time. Lastly, to assess the impacts of turbines on the annual LEPC count at the facility, the researchers modeled the sum of the maximum LEPC counts across all leks within each year.



LESSER PRAIRIE CHICKEN | J.N. STUART, FLICKR

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KEY PROJECT FINDINGS/TAKEAWAYS:

- **Results corroborated findings of the original study:** Careful siting of new wind energy facilities (i.e., concentrating turbines in cultivated croplands) in LEPC range is good minimization measure while balancing the societal need for renewable energy.
- **Turbine density is a consistent predictor of LPC lek persistence:** The density of wind turbines did affect lek persistence, but the magnitude of that effect was lower in areas with high proportion of grasslands.
- **Decisions around sitting matter:** Leks with greater proportion of grassland had lower probability of blinking out regardless of presence of wind turbines, and the abundance of LEPCs did not appear to be impacted by the presence of the wind turbines over the 8-year research study. This suggests that LEPC population persistence depended more on the availability of preferred habitat than the presence of wind turbines.

APPLICATION OF FINDINGS AND NEXT STEPS:

- The findings of this research contribute to a growing body-of-evidence that should inform future wind energy siting and development.
- While findings of this research are based 8 years of data, pre-construction data was not available, which limits the ability to compare LPC occupancy and abundance to pre-existing conditions. Replicating the study at a site where pre-construction data can be obtained and occurring in an area where available habitat differs would improve this body of research. However, findings from this study should be used within a body-of-evidence approach as one of many tools that should inform future wind energy development.

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CITATION:

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