Wind Wildlife Research Fund

RESULTS SUMMARY

April 13, 2020

Placement of Wind Energy Infrastructure Matters: A Quantitative Study Evaluating Response of Lesser Prairie-Chicken to a Wind Energy Facility

A study supported by the Wind Wildlife Research Fund investigates the effects of wind energy infrastructure on lesser prairie-chickens over three years at a wind energy facility in Kansas.

Lesser prairie-chickens (LEPC), endemic to the North American Great Plains, have experienced range-wide population declines as habitat has been lost or fragmented due to landscape changes. Because they require large intact tracts of prairie, LEPC are considered an "umbrella" species where their conservation is expected to also benefit other grassland species.

Wind energy infrastructure (WEI) has the potential to contribute to loss and fragmentation of LEPC habitat. The purpose of this study was to investigate the effects of WEI on multiple LEPC population parameters. This is the first study that directly quantifies LEPC population response to WEI development.

The full report is available online at www.awwi.org/resources/wwrf-lesser-prairie-chicken-2019.

STUDY OBJECTIVES

This three-year study focused on the Cimarron Bend Wind Energy Facility and surrounding area, located in the Central Great Plains in Clark County, Kansas, and aimed to identify:

- Whether LEPC were being displaced from seasonal habitats by WEI
- The effects of WEI on nest and individual survival
- Whether wind turbines acted as a barrier to LEPC movements

KEY TAKEAWAYS

- This study found no negative effects of WEI on LEPC habitat selection or survival.
- The wind facility in this study was built in a previously disturbed landscape (mostly from agriculture). Results suggest that impacts to local LEPC populations from wind energy facilities might be minimized by placing infrastructure in previously disturbed habitats.
- There is no pre-construction data for this site and the full extent of impacts may not be fully realized over the relative short (3-year) duration of this study. A longer-term dataset would help in fully understanding the effects of the wind energy facility on this LEPC population and draw more definitive conclusions for other LEPC populations.

NEXT STEPS

- This study will continue in 2020. Additional years of monitoring will increase sample sizes, address variability over time, and allow for assessment of any potential time lags in the response of this population to the presence of WEI.
- More robust studies, e.g., those designed as before-after/control-impact in various landscapes, including intact grassland, are a priority for understanding how LEPC respond to wind energy development.

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STUDY DESIGN

To estimate the effects of wind energy development on LEPC habitat selection and survival, researchers captured and monitored 43 male and 32 female LEPC over a three-year period following the development of the Cimarron Bend Wind Energy Facility, comprising 200 2-megawatt wind turbines that became operational in March 2017. Because the turbines were located in croplands, any effect of the facility on the local LEPC population is likely confounded by established avoidance behavior relative to high levels of fragmentation associated with cropland. To account for this potential confounding effect, individual LEPC were captured each year at multiple leks (areas used by males for display to attract hens), including leks located 1) in close proximity to turbines, 2) within intact grassland habitats, and 3) in the northeast corner of the wind energy facility where the effect of cropland could be differentiated from that of WEI.

STUDY RESULTS

WEI did not appear to affect LEPC habitat selection during the breeding and nesting periods. Relative probability of nest site selection increased with distance from wind facility disturbance, but this appeared to be due to the placement of turbines in low-quality nesting habitat rather than to avoidance of WEI by nesting females.

The authors did not detect any negative effects of WEI on nest survival or on annual survival of adults.

Rather, they observed a decrease in risk of mortality for individuals that selected habitats with a higher density of turbines and access roads.

Finally, the authors did not find any evidence that the WEI negatively affected local movements of females or males during the breeding or non-breeding periods.

CITATION

LeBeau, C., M. Kauffman, K. Smith, J. Haddock, A. Tanner, and K. Kosciuch. 2020. Placement of Wind Energy Infrastructure Matters: A Quantitative Study Evaluating Response of Lesser Prairie-Chicken to a Wind Energy Facility. AWWI Technical Report. Washington, DC. Available at www.awwi.org. This report is the first product of the Wind Wildlife Research Fund.