

Prairie Grouse Action Plan, 2023-2027



GREATER PRAIRIE-CHICKEN



SHARP-TAILED GROUSE

SOUTH DAKOTA DEPARTMENT OF GAME, FISH AND PARKS

PIERRE, SOUTH DAKOTA

WILDLIFE DIVISION REPORT 2023-03

May 2023



This action plan will be used by the South Dakota Department of Game, Fish and Parks staff on an annual basis and will be formally evaluated at least every five years. Plan updates and changes, however, may occur more frequently as needed.

A supportive document to this action plan, the “Management of Prairie Grouse in South Dakota,” provides a historical background, general ecology, management surveys and monitoring, research, hunting season structure and authority, harvest and habitat trends, priority habitat areas, and issues, challenges, and opportunities. This supportive document can be found at https://gfp.sd.gov/UserDocs/docs/management_of_prairie_grouse.pdf.

ACKNOWLEDGMENTS

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All text and data contained within this document are subject to revision for corrections, updates, and data analyses.

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PUBLIC INVOLVEMENT

A draft South Dakota prairie grouse management plan was available for public comment March 16 – May 3, 2023

INTRODUCTION

South Dakota (SD) is home to two species of true prairie grouse, the sharp-tailed grouse (*Tympanuchus phasianellus*) and greater prairie-chicken (*Tympanuchus cupido*, hereafter prairie-chicken). Prairie grouse are medium sized (16–18 in [41–46 cm] long, 1.3–2.2 pounds [0.6–1.0 kg]) round-bodied and short-legged game birds native to grasslands, steppe, and mixed-shrub habitats of North America. Their cryptic coloration functions as camouflage and allows the birds to blend into the grassland habitat, reducing detection from predators. The unique feathering of the legs and nostrils make them especially adapted to cold and snowy climates found in SD. The feathering of the legs and feet is more pronounced in sharp-tailed grouse, whereas the feet of prairie-chickens appear nearly featherless. Although most prominent in sharp-tailed grouse, an additional adaptation to winter weather in both species is the lateral pectinate scales on their feet which perform like snowshoes.

The primary differentiating feature between the two species of prairie grouse is the shape of the tail. Sharp-tailed grouse, like the name suggests, have tail feathers which come to a sharp point while tail feathers of prairie-chickens are gently rounded. The distinct dark barring over much of the body of a prairie-chicken also differs from the generally non-barred dark colored dorsal and light-colored ventral coloration of sharp-tailed grouse. The long pinnae, or ear feathers which are erected during male courtship displays, are absent on sharp-tailed grouse. Both species of male prairie grouse have colored external air sacs located on each side of the neck which are inflated during courtship. These air sacs are purple for sharp-tailed grouse and orange for prairie-chickens.

As their name suggests, prairie grouse are found primarily within landscapes dominated by grassland habitat. Prairie grouse are an indicator of a functioning prairie ecosystem which suggests landscape-level habitat exists for other prairie obligate species. Prairie grouse are considered “flagship” species for conservation of prairie habitat throughout their range and in SD. The unique behavior and habitat use of prairie grouse make them an exciting game bird and valued watchable wildlife species. Most prairie grouse hunting occurs on open grasslands with the aid of dogs, often pointing breeds. The explosive flush of prairie grouse attracts thousands of hunters to SD each year. South Dakota is one of the few states where both species of prairie grouse can be harvested under liberal hunting regulations. Hunting is authorized from the third Saturday of September through the first Sunday in January with a combined daily bag limit of three prairie grouse.

The South Dakota Department of Game, Fish and Parks (GFP) manage wildlife and their associated habitats for their sustained and equitable use, and for the benefit, welfare, and enjoyment of the people of SD and its visitors. This action plan is intended to guide wildlife managers and biologists and aid decision-making process of the GFP Commission to ensure prairie grouse and their habitats are managed appropriately, addressing both biological and social considerations. It also serves to inform sportsmen and women, Landowners, and all others interested in prairie grouse management in South Dakota.

SURVEYS AND MONITORING

Traditional Lek Surveys

Lek counts are the most widely used method to survey prairie grouse throughout their range. Male attendance on leks is relatively stable throughout the breeding season while female attendance is highly variable and exhibits distinct peaks. Starting in the early 1950s, department staff annually searched established survey areas which were approximately 40 mi² (104 km²) for prairie grouse leks and counted all males attending each lek. The number of males/area was tracked from year to year and was considered an index to the spring population (Figure 1). The survey was largely discontinued after 2019 with future population monitoring likely to come from sample-based surveys.

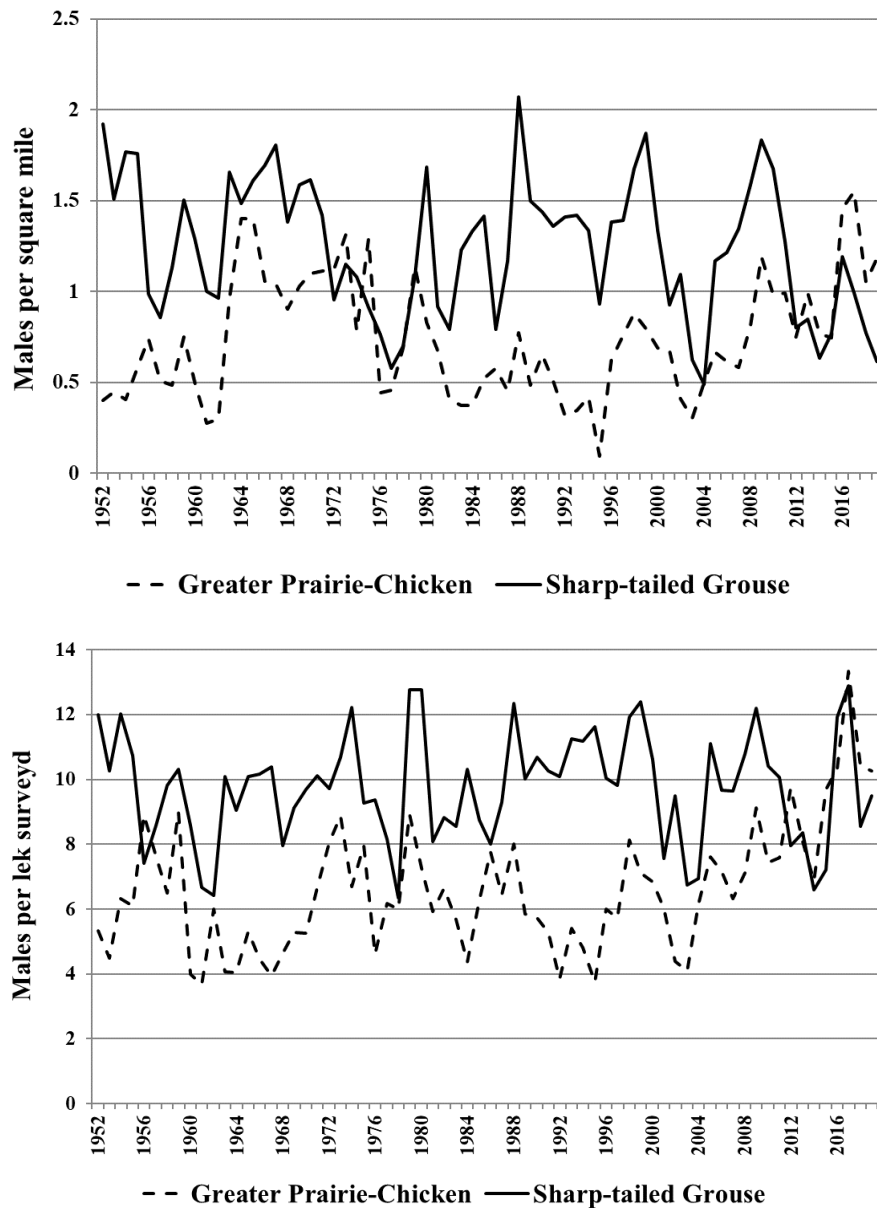


Figure 1. Results of prairie grouse traditional lek surveys 1952–2019.

Sample Based Surveys for Population Monitoring and Occurrence/Density Modeling

GFP collaborated with North Dakota Department of Game and Fish to develop a spatially explicit habitat-based occurrence/density model for the Dakotas. Data were collected by determining presence or absence of prairie grouse leks on 1 mi² (2.56 km²) sample units. Samples were spatially balanced and occurred along a gradient of landscape-level grassland availability. Each section was searched 2–3 times per year and if a lek(s) was present, the number of males was also counted. Models were developed to predict occurrence and density of prairie grouse based on landscape level habitat characteristics and climate variables (Runia et al. 2021).

Spatially-explicit habitat-based occurrence and density maps were developed from the models (Figure 2). These models are valuable tools for identifying and prioritizing areas for conservation treatments such as protection, restoration, or enhancement of habitat. Model-based estimates of the distribution and abundance of prairie grouse can also serve as a baseline for population monitoring. GFP intends to repeat this methodology periodically in the future, ideally in collaboration with adjacent states to conduct population monitoring across large portions of the species' range with similar methods.

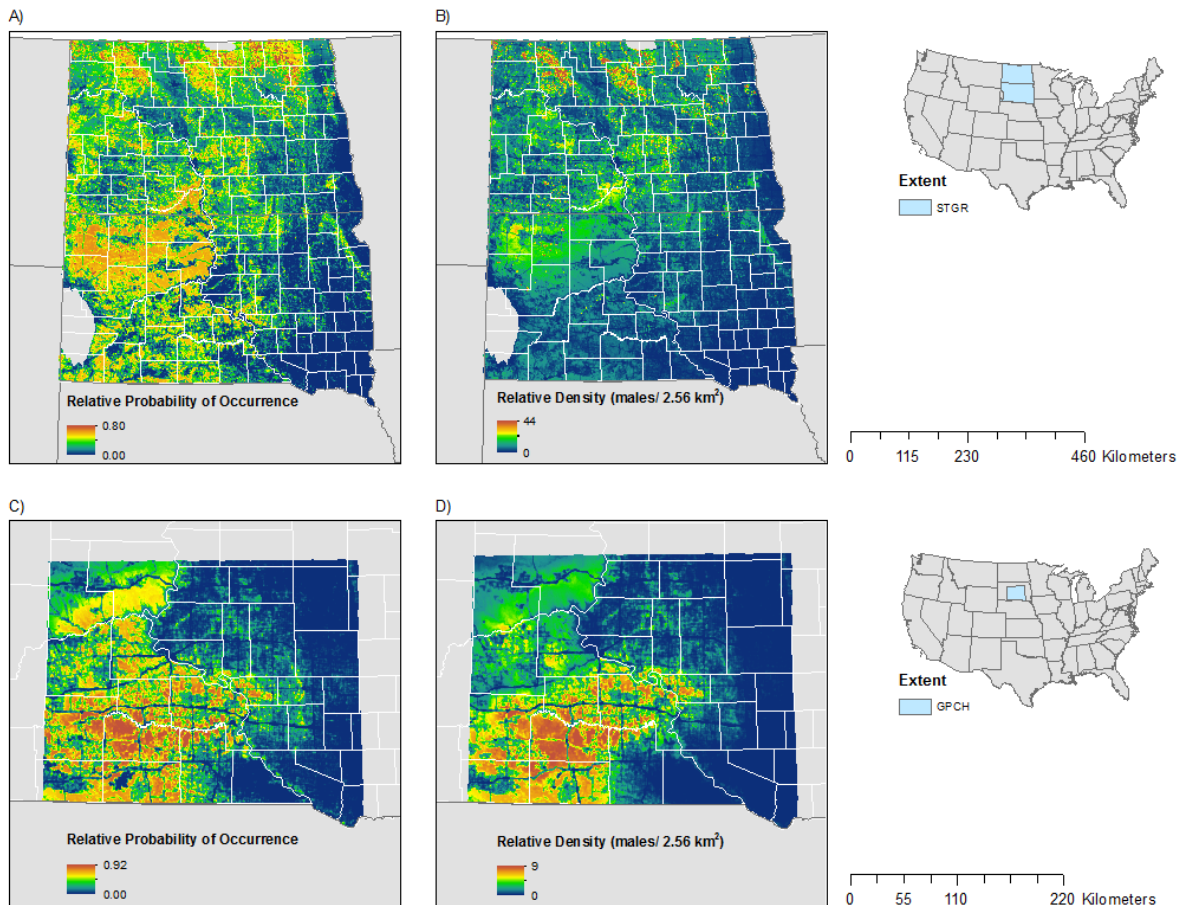


Figure 2. Maps of predicted probability of occurrence and relative density of sharp-tailed grouse (A and B) and greater prairie-chicken (C and D) in North and South Dakota, USA, 2010–2016 (Runia et al. 2021). Gray indicates areas outside the region of analysis.

Age Ratio Surveys

Wings from hunter-harvested prairie grouse are also collected during the first two weeks of the season at wing collection boxes located west of the Missouri River (<https://gfp.sd.gov/prairie-grouse/>). Hunters are encouraged to place one wing from each harvested grouse in collection boxes. Each wing is identified to species (sharp-tailed grouse or greater prairie-chicken) and aged (adult or hatch year) to determine species harvest distribution and age ratios. The ratio of hatch year to adult grouse can be used to gauge production during that specific year (Figure 3). Biologists use these data to relate grouse production to weather variables to predict grouse production in future years. Prior to the hunting season the predictions are posted as prairie grouse hunting outlook document.

Statewide Prairie Grouse Age Ratio

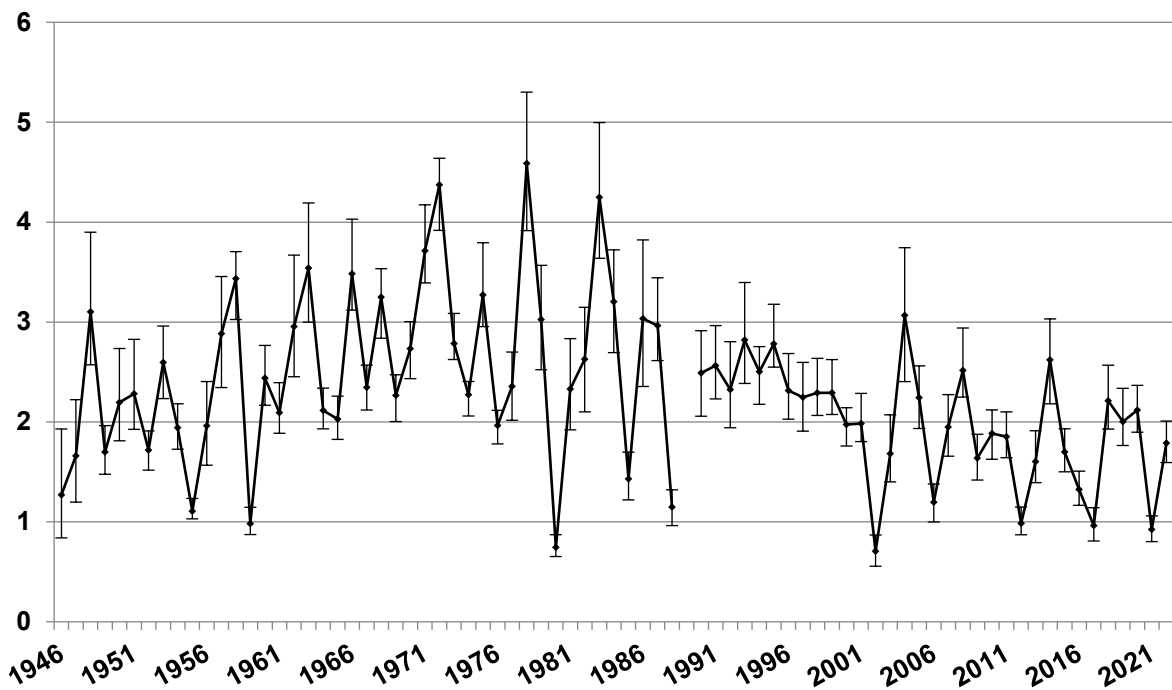


Figure 3. Statewide prairie grouse age ratio (\pm 95% confidence interval) from fall hunter-harvested sharp-tailed grouse and greater prairie-chickens 1946–2022.

PRIORITY HABITAT AREAS

A system of tiered Priority Habitat Areas has been developed to delineate landscape level habitat for sharp-tailed grouse (Figure 4) and greater prairie-chickens (Figure 5) in SD. The system is based on the spatially explicit, habitat-based models published by Runia et al. (2021). As previously described in the *Surveys and monitoring* section, prairie grouse density models and associated maps/GIS layers were developed based on landscape-level habitat characteristics. We post-processed the species-specific continuous density layers into a system of categorical tiers. We selected predicted prairie grouse density thresholds to categorize habitat as Tier 1 (highest quality), Tier 2, Tier 3, and Low-Quality habitat. These Priority Habitat Areas will serve as an

important tool for many aspects of prairie grouse habitat management, including landscape and local habitat treatments, targeted conservation measures, and habitat suitability during environmental review processes and assessments.

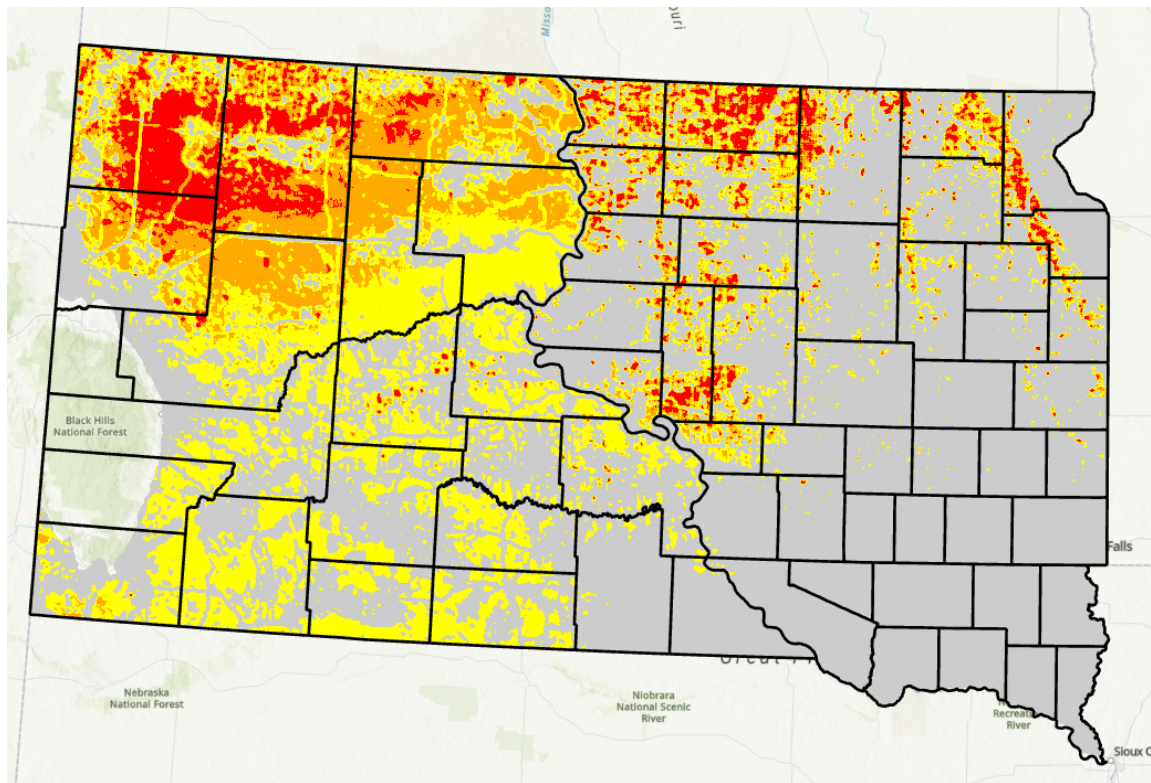


Figure 4. Sharp-tailed grouse priority habitat threshold table and associated map derived from Runia et al. (2021). Areas not categorized as Tier 1, Tier 2 or Tier 3 are considered Low-Quality habitat. Gray areas indicate the analysis area. Note, not all Priority Areas may be visible at the displayed scale.

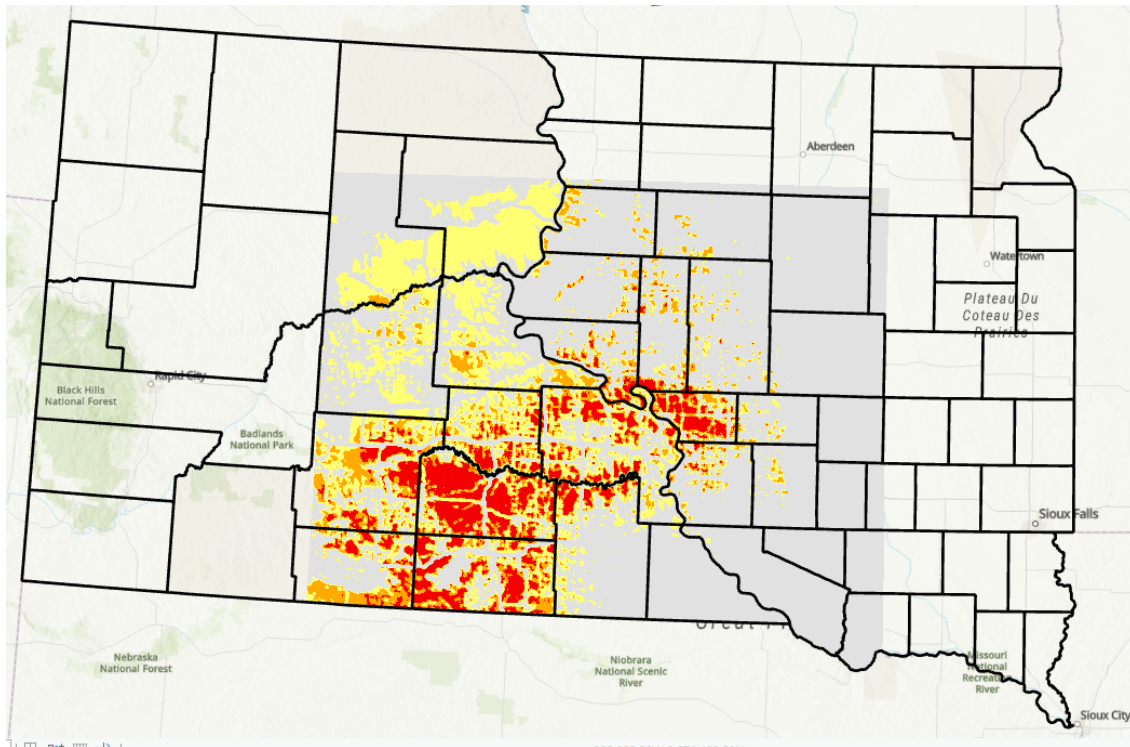


Figure 5. Greater prairie-chicken priority habitat threshold table and associated map derived from Runia et al. (2021). Areas not categorized as Tier 1, Tier 2 or Tier 3 are considered Low-Quality habitat. Gray areas indicate the analysis area. Note, not all Priority Areas may be visible at the displayed scale.

MANAGEMENT OBJECTIVES AND STRATEGIES

Objective 1: Promote and implement responsible stewardship of prairie grouse habitat on public and private lands.

Strategies:

- 1.1 Use identified Priority Habitat Areas (Priority Habitat Areas of this document; Runia et al. 2021) to guide the strategic use of habitat management and conservation practices (page 26 of the Management of Prairie Grouse in South Dakota document) that provide or enhance quality prairie grouse habitat.

- 1.1.1 Provide shapefile of Priority Habitat Areas to GFP Private Lands biologists and interested conservation partners for implementation of habitat management and conservation practices.

- 1.1.2 Provide financial and technical support to interested landowners through department private lands cost-share programs, and partner programs to create or improve existing grouse habitat through range management projects and grazing stewardship practices.

1.1.3 Continue to support partnership positions to improve habitat across South Dakota and increase the number of supported positions when financially possible. Encourage partnership positions to implement grassland management and conservation in Priority Habitat Areas while delivering other habitat management programs to interested landowners.

1.2 Where prairie grouse are the primary habitat management species, best management practices for prairie grouse habitat management (page 33 of the Management of Prairie Grouse in South Dakota document) should be considered with discretion to guide development and updates of Game Production Area management plans and the department's private lands cost-share program within fiscal, biological, and land use constraints in and around identified Priority Habitat Areas.

1.2.1 Create a best management practices document outlining habitat management and conservation practice guidelines that benefit prairie grouse for distribution to GFP staff and interested private landowners.

Objective 2: Monitor prairie grouse abundance, harvest, hunter numbers, and hunter satisfaction.

Strategies

2.1 Annually conduct traditional lek and wing collection surveys (outlines in Monitoring and Surveys section of this document) in western SD to evaluate population status, and the age ratio and species composition of harvested grouse.

2.1.1 Collaborate with Forest Service biologists to relate weather variables to prairie grouse production on federal lands and other areas using wing data.

2.2 Annually conduct and summarize results of hunter harvest surveys to project prairie grouse harvest, number of prairie grouse hunters, and hunter satisfaction.

2.3 Annually prepare a prairie grouse hunting forecast based on spring lek counts and an existing production model based on weather variables.

Objective 3: Address future concerns with energy development and prairie grouse while evaluating future research needs on this topic.

Strategies

3.1 Support research projects investigating potential impacts of energy infrastructure on prairie grouse while evaluating needs for additional research on the subject.

3.1.1 Assist research cooperators by completing prairie grouse lek surveys, captures, and other necessary biological data collection for current energy research projects.

- 3.1.2 Assist research cooperators with data analysis, reporting results, and publications for current energy projects.
- 3.2** Provide energy developers pre-construction survey protocol (page 34 of the Management of Prairie Grouse document) during the planning/permitting phase of the planned development.
- 3.3** Provide energy developers with mitigation framework (Page 36 of the Management of Prairie Grouse document) for avoidance, minimization, and mitigation efforts.

LITERATURE CITED

Runia, T. J., A. J. Solem, N. D. Niemuth, and K. W. Barnes. 2021. Spatially explicit habitat models for prairie grouse: implications for improved population monitoring and targeted conservation. *Wildlife Society Bulletin* 45:36–54.