

## **Alberta Conservation Association 2010/11 Project Summary Report**

**Project Name:** *Sharp-tailed Grouse Habitat Inventory and Stewardship*

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**Primary ACA staff on project:**

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### **Partnerships**

Alberta Sustainable Resource Development  
High Prairie Grazing Reserve  
Special Areas Management Board  
Wanham Grazing Reserve

### **Key Findings**

- Produced a map that predicts areas more likely to have a sharp-tailed grouse lek in wildlife management units 102 and 118 in the southeast corner of Alberta.
- Heavy snowfall throughout April prevented us from completing roughly half of our targeted survey transects.
- Located 11 (78%) of the 14 leks detected in areas we predicted to have a high probability of occurrence.
- Mapped nesting and brood-rearing habitat at High Prairie Grazing Reserve to assist in development of ‘best management practices’ for pasture management in consideration of wildlife.
- Recommend that grazing reserves should defer grazing and retain shrubby cover in pastures containing lek sites. Fall grazing in these pastures should be light enough to provide residual cover for spring nesting cover.

### **Introduction**

Sharp-tailed grouse (*Tympanuchus phasianellus*) populations may be declining in Alberta. In order to better understand long-term population trends across a broad geographic extent, it is important to develop habitat-based inventory tools that are statistically defensible and robust (Boyce et al. 2002). We had early success applying a resource selection function (RSF) to locate leks in areas of high, medium and low likelihoods of occurrence for sharp-tailed grouse near Coronation between 2006 and 2008 (Hamilton and Manzer, in press). Applying a distance sampling technique, we were also successful in estimating lek densities in areas classed as high, medium and low strata. We applied a similar approach in a new location in 2010, by developing a predictive habitat model and surveying along transects using a distance sampling approach.

Grazing reserves provide some of the largest intact grassland ecosystems in northern Alberta. As a result, these landscapes provide important habitat to sharp-tailed grouse. Due to population declines and lek abandonment observed in some grazing reserves, we initiated habitat inventories as a first step towards development of best management practices aimed at improving nesting and brood rearing cover at the High Prairie Grazing Reserve (HPGR).

## Methods

We used remote-sensed information to characterize habitat features associated with sharp-tailed grouse (Grassland Vegetation Index; ASRD 2008; Figure 1). We developed predictions about where leks may occur based on our understanding of how the system may work. We assumed leks would be located in areas with habitat features associated with nesting and brood-rearing cover, and compared *a-priori* models using known lek sites to select the best one. The study site was then stratified into areas ranked from high to low likelihood of lek occurrence based on the best model. We walked along transects placed at random within areas classed as low and high strata to detect previously unknown lek sites, and used these data to both validate the accuracy of our initial predictive model, as well as apply a distance sampling approach (Buckland et al. 2001) to estimate lek density.

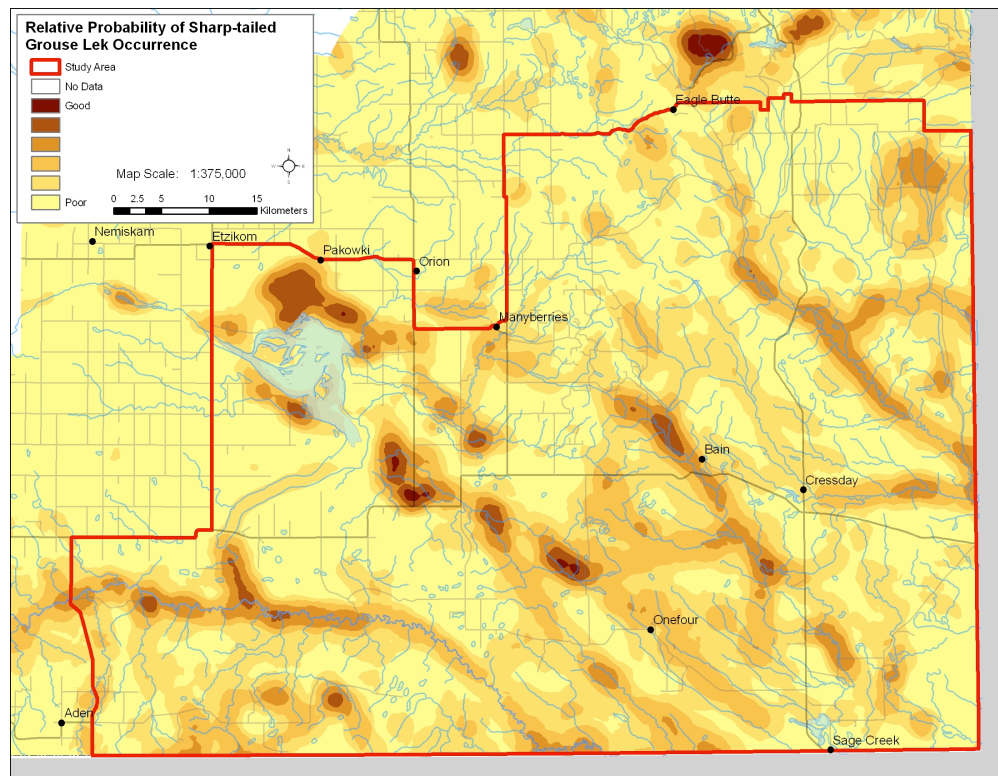


Figure 1. Site suitability for sharp-tailed grouse leks as estimated by a resource selection function (RSF) that incorporated the proportion of native grasslands, medium shrubs, and habitat types known to produce wet conditions associated with good brood-rearing habitat (irrigated pasture, overflow and sub-irrigated site-types). Good index values indicate an increased probability of finding sharp-tailed grouse lek sites.

To support development of best management practices at grazing reserves, we used remote-sensed data to inventory nesting and brood-rearing habitat for sharp-tailed grouse at HPGR. We also evaluated pasture histories surrounding historic lek sites to identify practices that are incompatible with breeding needs. We developed best management practices that emphasized retention of nesting and brood-rearing cover in pastures occupied by sharp-tailed grouse leks.

## Results

Our initial model worked well for guiding survey effort. Only 3 of 14 observed leks were on transects that averaged to be ‘poor’. This result indicates that using the average RSF score around each transect is a useful way to stratify survey effort. Poor weather limited our ability to survey an adequate sample area within the 4-week period of peak lekking activity, although we did locate leks at an expected rate per kilometre of transect. We were unable to locate enough leks to perform distance sampling analysis.

The refined habitat model for wildlife management units (WMU) 102 and 118 (Figure 1) included variables that we predicted would explain good breeding habitat (Table 1). The model included positive association with native grassland, shrubs of medium height, and GVI site types known to produce wet conditions associated with good brood-rearing habitat (irrigated pasture, overflow and sub-irrigated site-types).

Table 1. Covariates included in the accepted model predicting sharp-tailed grouse lek locations in southeastern Alberta. Model was built using information from 46 historic lek locations and 3,500 random points across an area of 5,075 km<sup>2</sup>. Variables were generated from the Grassland Vegetative Index (GVI).

Variable	Relationship to lek site
Proportion of native grasslands	+
Proportion with shrubs of medium height	+
Proportion of irrigated pasture	+
Proportion of sub-irrigate site type	+
Proportion of overflow site type	+

We found reduced amounts of nesting cover (relative to historic conditions) adjacent to lek sites on the High Prairie Grazing Reserve at which the number of attending males has declined. The reduction in nesting cover appears to have resulted from pasture improvements whereby native shrubs were removed coincidentally to efforts made to eliminate a cutworm problem.

## Conclusions

Despite our success in developing a RSF in a new area, successive field efforts that continue to rely primarily on intensive human resource efforts appear to be logistically challenging. Inclement and unpredictable weather patterns caused several problems with reduced lek activity

and a diminished ability to detect leks. Future efforts will continue to pursue development of habitat-based survey methods, along with approaches that place greater emphasis on using technologically-advanced detection tools that are less sensitive to unpredictable weather.

Best management practices for HPGR focused primarily on practices that promote re-establishment of nesting and brood-rearing habitat adjacent to historic lek sites. We recommend retention of shrub cover and deferred moderate grazing to promote nesting and brood-rearing cover.

## **Communications**

- Published and distributed *Sharp-tailed Grouse Through the Seasons* pamphlet to various agencies throughout Alberta.

## **Literature Cited**

Alberta Sustainable Resource Development. 2008. Grassland Vegetation Index (GVI) specifications. Resource Information Management Branch, Strategic Corporate Services Division. Edmonton, Alberta.

Boyce, M.S., P.R. Vernier, S.E. Nielsen, and F.K.A. Schmiegelow. 2002. Evaluating resource selection functions. *Ecological Modeling* 157: 281-300.

Buckland, S.T., D.R. Anderson, K.P. Burnham, J.L. Laake, D.L. Borchers, and L. Thomas. 2001. *Introduction to Distance Sampling: Estimating Abundance of Biological Populations*. Oxford University Press. Oxford, New York, USA.

Hamilton, S., and D. Manzer. In Press. Estimating sharp-tailed grouse lek occurrence and density over broad spatial extents. Accepted by *Wildlife Biology*.

Photos:

Sharp-tailed grouse lek in early spring. (Photo: Michael Jokinen)

Training staff for surveys on a cold day in April 2010. (Photo: Julie Landry-Deboer)

Alberta Conservation Association staff member, Corey Rasmussen, plans his route for the following morning. (Photo: Julie Landry-Deboer)

Inclement weather prevents our surveys. (Photo: Julie Landry-Deboer)