Alberta Conservation Association
2007/08 Project Summary Report

Project name: Sharp-tailed Grouse Inventory Modeling Program

Project leader: Stephen Hamilton

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Partnerships:

Alberta Sport, Recreation, Parks, and Wildlife Foundation

Key findings

- 57 leks were detected from 202 surveys in 2007.
- Classification accuracy increased from K = 0.45 (61%) to K = 0.62 (73%) when differentiating open / closed pasture.
- 95% of surveyors could detect leks up to 1.3 km away.
- Leks were found more often in 'high' quality habitat areas than would be expected by chance.

Introduction

Sharp-tailed grouse (*Tympanuchus phasianellus*) are in decline across North America (Storch 2000). Successfully developing rigorous tools for monitoring sharp-tailed grouse populations in Alberta over space and time is a key problem identified by the Alberta Grouse Technical Council. In 2005, the Alberta Conservation Association (ACA) began development of a habitat-based monitoring tool for sharp-tailed grouse using an adaptive approach. We have applied a resource selection function (RSF) to identify habitat important for grouse based on lek survey locations. We are currently developing an estimate of lek density based on these survey data, in combination with lek detection functions. Applied over broad spatial extents, this framework will both allow us to quantify the decrease or increase of natural habitat over time, as well as provide a measure for approximating population trends throughout the area of interest.

Methods

The ACA initiated a pilot program in 2005/2006 over a 26,000 km^2 area encompassing the Special Areas to develop habitat-based monitoring tools for sharp-tailed grouse (Figure 1). During that period, we derived a vegetation classification from a Landsat 5 TM image, compiled a collection of historical lek locations, and developed an RSF based on these data. In 2006/2007, our objectives were to validate the RSF from field data collected in April 2006, and improve the vegetation classification for the Landsat image. In 2007, we built a new RSF based on the 2006 findings and began new surveys in April 2007 to validate the more recent model. We used the

data from the 2007 surveys in conjunction with the 2006 data to build a third RSF in preparation for the 2008 field season. We performed surveys from year to year at a quarter section level, with surveyors walking along the inside perimeter of the quarter, stopping and listening for leks for 2 - 3 minutes at each corner of the transect. We enhanced the vegetation classification underlying the RSF as well with the addition of new ground-truth data. Results from 2006 and 2007 surveys were further used to begin development of lek detection functions relative to time of day, distance, weather, and day of month.

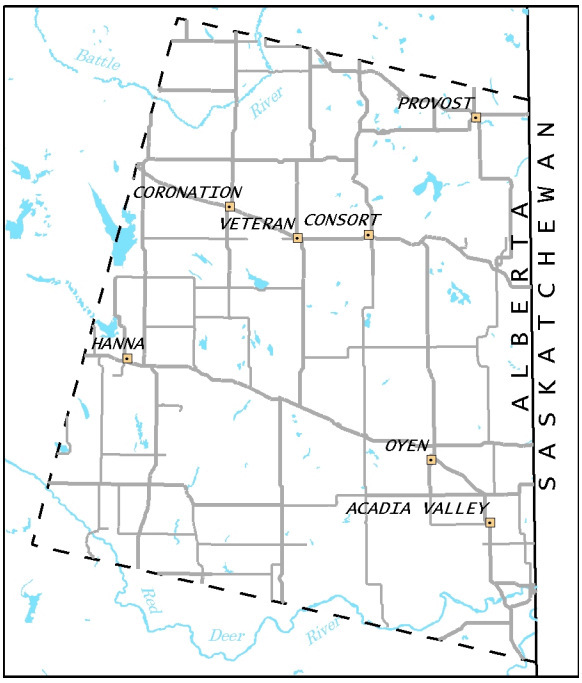

Figure 1. Map of the sharp-tailed grouse project study area.

Results

We surveyed 202 transects in April 2007 and found 57 leks, an improvement over 2006 in which we surveyed one week longer, completing 216 transects, but only detecting 47 leks. We were also more successful in contacting landholders (262 in 2007 vs. 150 in 2006) and of those contacted we were only denied permission for access 16 times. Furthermore, nearly half of landholders requested an information package be mailed to them.

With the addition of a second ground-truthing surveyor, we were able to increase the sample size of vegetation cover validation points over 100% from the previous two years. The resulting accuracy of the classification increased accordingly in all tiers of the classification, with a kappa statistic of 0.62 (overall accuracy 73%) when differentiating between open and closed pasture. The classification rose to 88% accurate (K = 0.78) when considering the differences between crop and pasture.

In preparation for the 2008 field surveys, we built a new RSF using the survey data from 2006 and 2007 together. We used AIC to select the model that represented the amount of high-cover

grassland (up to 8 km^2) and inverse distance to crop as the basis for the 2008 RSF. This most closely resembles the female-based nesting model originally derived from the historical data used in the 2005-06 RSF.

Conclusion

The 2007/2008 program was successful in continuing lek surveys and improving both the land cover classification and the RSF. We were able to increase the efficiency of our field crews in both field components of the project, and improve our relationship with landholders in the study area.

We continue work on deriving a distance function for lek detection that will ultimately allow us to assess lek density and possibly change from using an RSF to using a Resource Selection Probability Function (RSPF) as the basis for surveys. An RSPF would allow us to estimate the actual probability of a lek being in a given quarter section based on the same habitat variables.

Communications

- A conceptualization of the detection function methodology was presented at the November 2007 meeting of the Alberta Grouse Technical Council.
- Information pamphlets were distributed to cooperating landowners.

Literature cited

Storch, I. 2000. Conservation status and threats to grouse worldwide: an overview. Wildlife Biology 6: 195-204.

Amanda Rezansoff conducting a ground-truth survey near Dowling Lake, Alberta. (Photo: Stephen Hamilton 2007)