Alberta Conservation Association
2008/09 Project Summary Report

Project name: *Habitat Selection by Pronghorn in Alberta*

Project leader: Paul Jones

Primary ACA staff on this project (including seasonals):
Paul Jones and Mike Grue

Partnerships
Alberta Fish and Game Association – Zone 1
Alberta Fish and Wildlife
Alberta Parks and Recreation
Alberta Professional Outfitters Association (Legacy Fund and Wildlife Management
Fund)
Alberta Antelope Guides
Canadian Forces Base Suffield
Foundation for North American Wild Sheep – Eastern Chapter
Safari Club International
Safari Club International – Northern Alberta Chapter (Hunting Heritage Fund)
Safari Club International – Alberta Chapter
University of Calgary

Key findings

- There was no distinct pattern in habitat selection by pronghorn at the 2nd and 3rd order when our study animals were grouped based on year of capture.
- Further examination of the data revealed that our study animals could be grouped into 3 types; those using native prairie, those using agricultural land and those using a mixture of native and agricultural lands.
- The 23rd Biennial Pronghorn Workshop was held in Alberta in 2008, organized in part by ACA staff.

Abstract

Pronghorn (Antilocapra americana) are the most specialized and representative large mammal that currently roams free among the diversity of prairie wildlife in North America. They are largely considered to be an obligate grassland species across the extent of their range. These grasslands in North America have been highly modified through the long-term expansion of agriculture, and in more recent times the extraction of oil and gas resources. The cumulative influence of these changes on pronghorn is unknown, but perhaps most urgent in Alberta where

the species is at the northern extreme of its range. To better understand the relationship between pronghorn and their environment, we are examining their use of habitat at two spatial scales during the winter and fawning periods. Our preliminary analysis did not produce any definitive patterns across the two spatial scales when animals were grouped based on year of capture. Using detrended correspondence analysis we were able to determine three types of pronghorn based on habitat composition of the fawning ranges; those that dwell predominantly in a) native grass prairie, b) agricultural land, and c) a mixture of native grass and agriculture. This early result is somewhat unexpected, as we anticipated a tendency toward more exclusive use of native grasslands. Our next phase of analysis will be to distinguish if individuals selected these habitat features in greater proportion than was available.

We co-hosted the 23rd Biennial Pronghorn Workshop in Canmore, Alberta, in partnership with Alberta Fish and Wildlife Division and the University of Calgary. The event was well attended from representatives across North America.

Introduction

Pronghorn (<u>Antilocapra</u> <u>americana</u>) are the most specialized and representative large mammal that currently roams free among the diversity of prairie wildlife in North America. Pronghorn are considered to be an obligate grassland species (Yoakum 2004). Though pronghorn in Alberta commonly experience high mortality due to severe winters and lower fawn survival, their fate is also linked to land use practice (Barrett 1982). Our focus is to examine how the distribution of pronghorn is associated with habitat and anthropogenic features. Specifically we will (1) examine the selection of seasonal home ranges on the basis of habitat and anthropogenic features (2nd order selection, Johnson 1980), and (2) determine the selection of specific habitat and land cover attributes within seasonal home ranges (3rd order selection, Johnson 1980). We predicted that pronghorn at the 2nd order would select seasonal ranges with a significantly higher proportion of native prairie and at the 3rd order would modify their use of space within the seasonal range to avoid anthropogenic features (roads and well sites).

Methods

We used GPS collar data to estimate home range use for winter and fawning seasons (2nd order), as well as looking at habitat use within those seasonal ranges (3rd order). We completed the preliminary analysis grouping animals based on year of capture to account for potential differences in environmental and latitudinal effects. At the 2nd order we compared the seasonal ranges separate by comparing the attributes of the pronghorn seasonal ranges to available ranges. We examined the two habitat and four anthropogenic attributes between the used and available seasonal ranges using the Mann-Whitney test. At the 3rd order we compared the use by pronghorn of nine habitat classes to random points within each seasonal range using the Mann-Whitney test. We compared the mean distance to four anthropogenic features between the pronghorn locations and random

points using the Mann-Whitney test. Based on our preliminary results we used detrended correspondence analysis to refine our grouping of animals and will complete the selection analysis based on the new groupings.

Results

There was no distinct pattern of selection at either the 2nd order or 3rd order when animals were grouped based on year of capture. For example at the 2nd order, pronghorn did not show any pattern of selection in Year 1 and Year 2 based on percent composition of winter ranges as native prairie, but in Year 3 pronghorn selected ranges with significantly higher percent native prairie (Figure 1). A similar pattern occurred for the fawning ranges except it was in Year 1 that the pronghorn ranges were significantly higher in percent native prairie than the available ranges (Figure 2). With the lack of a distinct pattern in our preliminary results we ran a detrended correspondence analysis to examine if there was an alternative pattern to grouping the animals. We used the fawning period to base these groupings as pronghorn will show fidelity to fawning ranges. The results showed three types of pronghorn based on habitat composition (Figure 3). We grouped our study animals based on those that dwell predominantly in native grass prairie, a group in agricultural land, and a group in a mixture of native grass and agriculture.
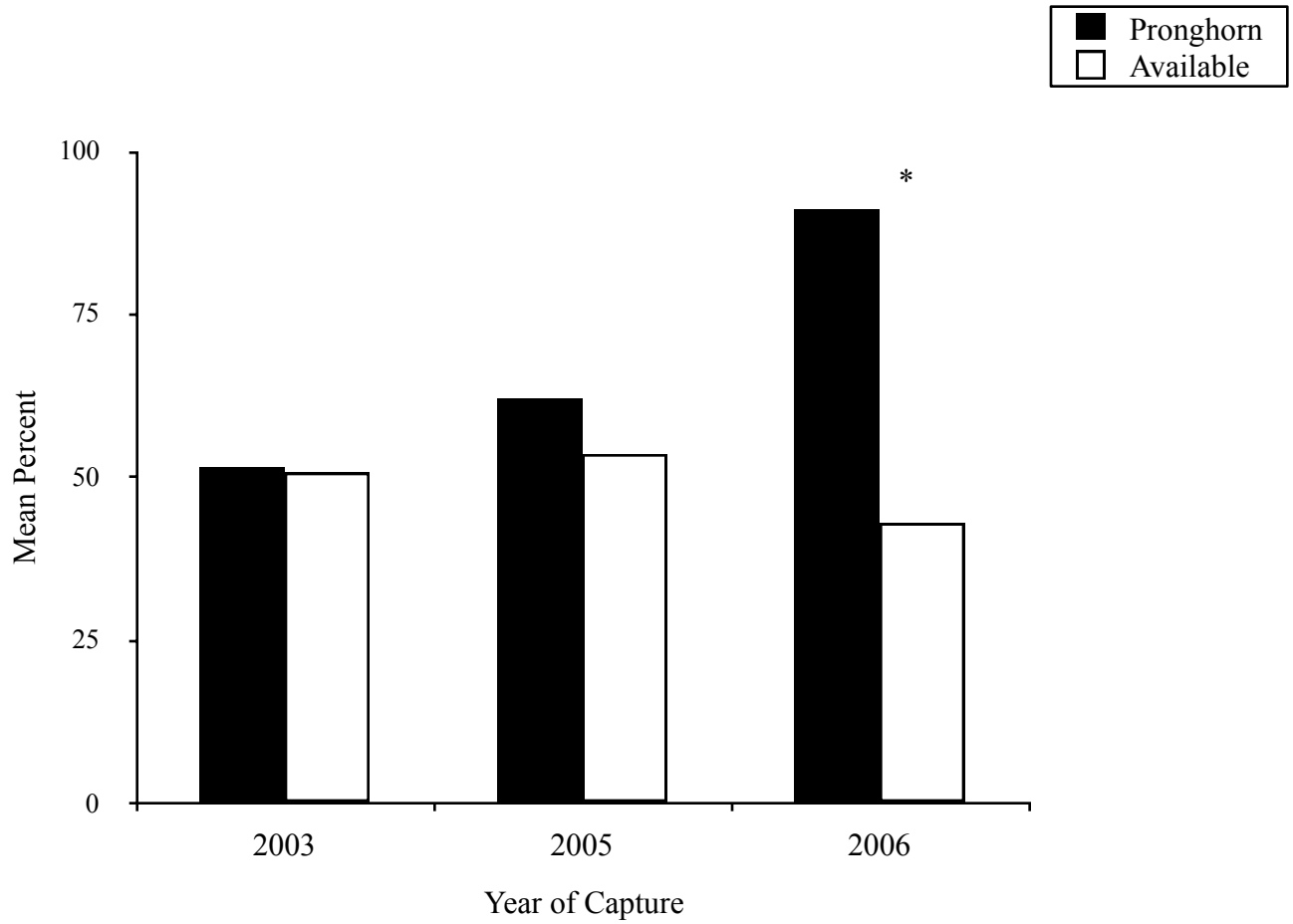
Figure 1.   Percent native prairie composition of winter ranges for pronghorn captured
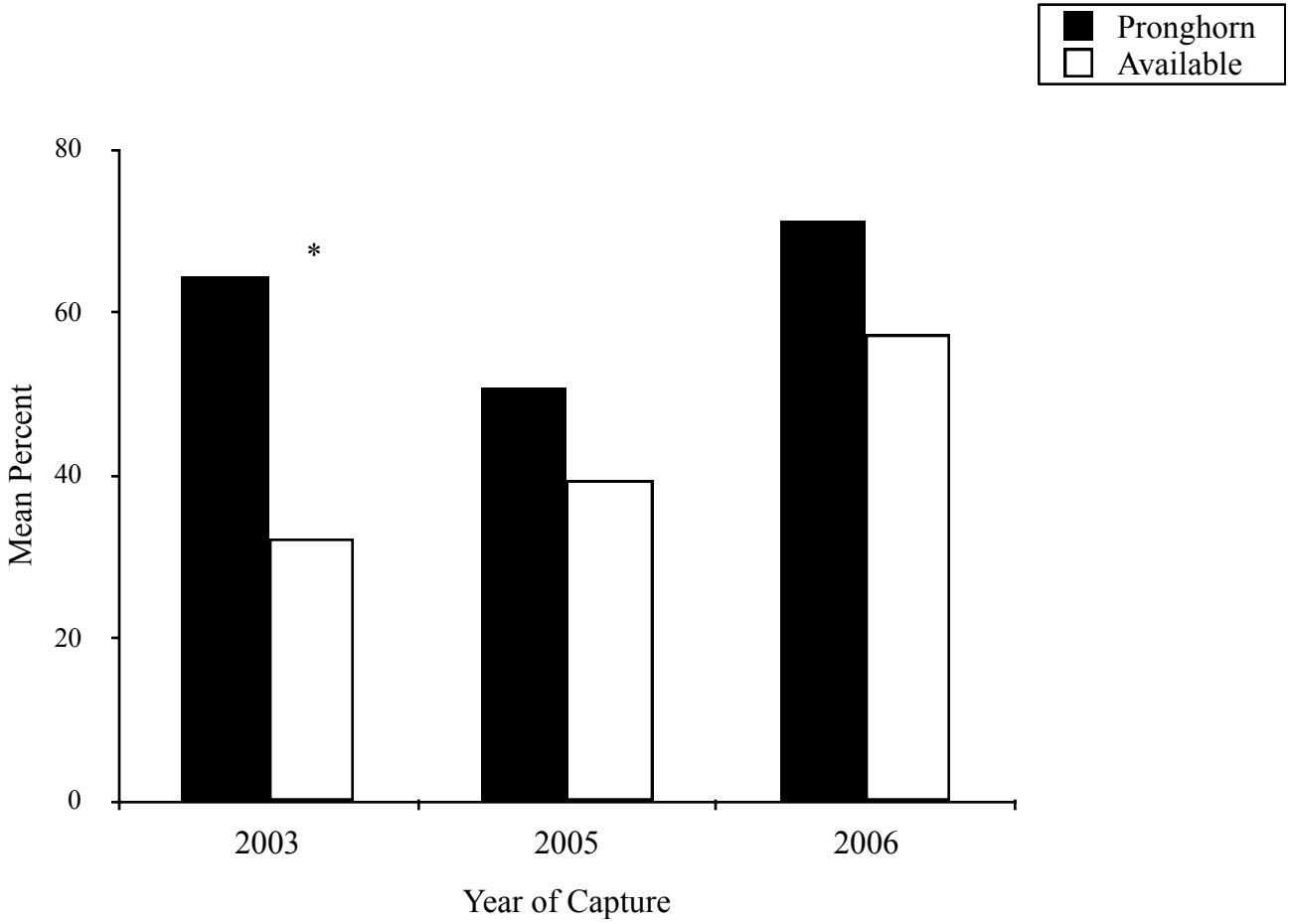between 2003 and 2006 in Alberta (* significantly different at p<0.001).

Figure 2.   Percent native prairie composition of fawning ranges for pronghorn captured between 2003 and 2006 in Alberta (* significantly different at p<0.01).
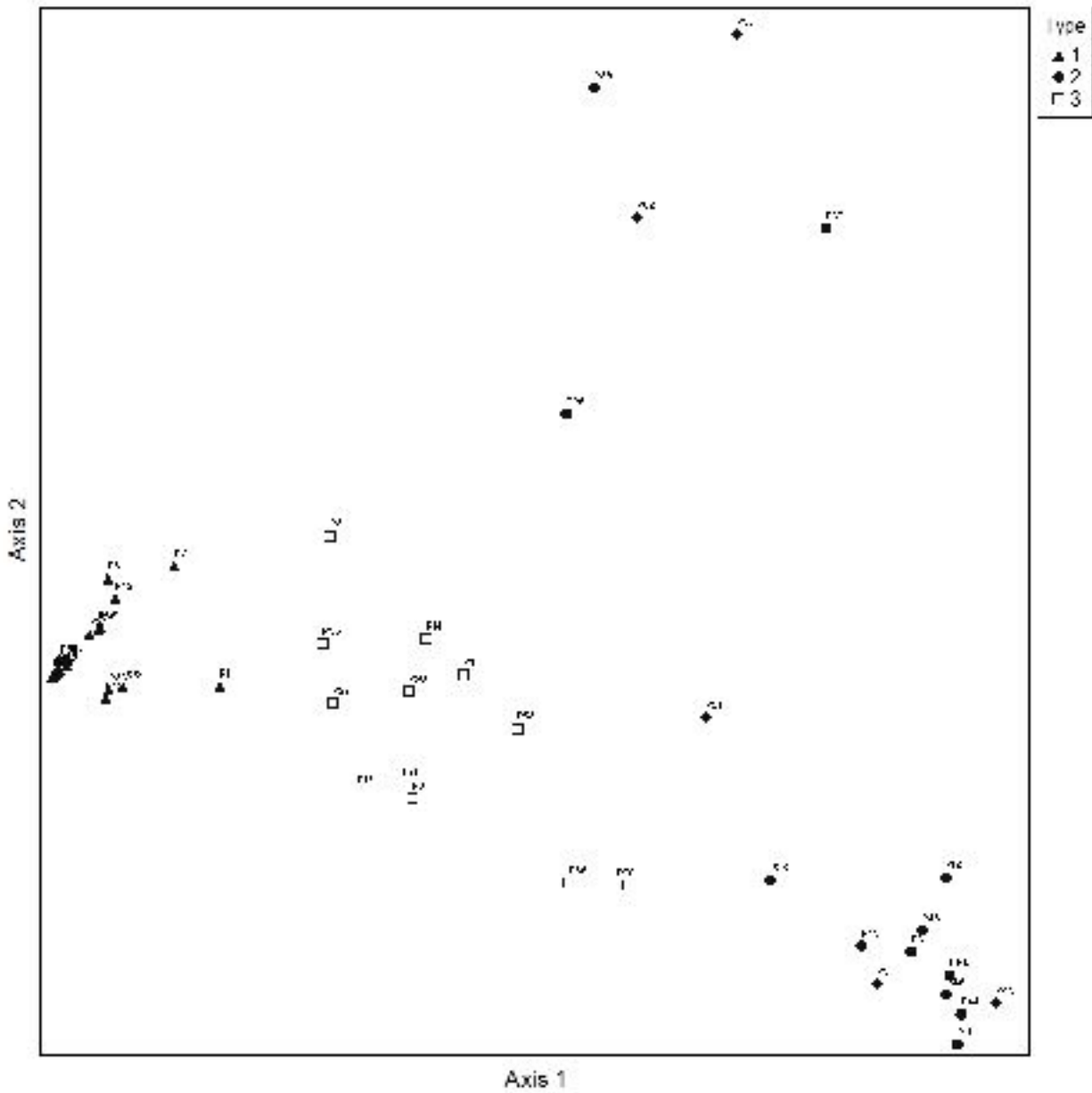
Figure 3.   Classification of pronghorn based on detrended correspondence analysis of fawning ranges (1 = native, 2 = agriculture and 3 =mixed; P1 = Pronghorn #1).

Conclusions

Based on our preliminary analysis there was not a distinct pattern in habitat selection by pronghorn when we grouped our study animals based on the year they were captured. When we re-examined our data we were able to detect three types of pronghorn based on habitat composition. We detected pronghorn that use predominantly native habitat, a group using

agricultural areas and a group that uses a mixture of native and agricultural. This early result is somewhat unexpected, as we anticipated a tendency toward more exclusive use of native grasslands. Our next phase of analysis will be to distinguish if individuals selected these habitat features in greater proportion than was available based on the three types of animals.

Communications
- Web Site - developed to convey program info (www.albertapronghorn.com) to workshop attendees and interested stakeholders.
- Co-host for 23rd Biennial Pronghorn Workshop, May 13-16 in Canmore.
- Proceedings of the 23rd Biennial Pronghorn Workshop.
- Presentations - Winter Habitat Selection by Pronghorn at Multiple Scales in Southern Alberta. Paul F. Jones, Mike Grue, Julie Landry-DeBoer, Mike Suitor, Cormack Gates, Dale Eslinger and Kim Morton at the 23rd Biennial Pronghorn Workshop.
- Presentation - Landowner Knows Best: Local Ecological Knowledge of Pronghorn Habitat Use in Southern Alberta. Paul Jones, Mike Grue and Julie Landry-DeBoer at the 23rd Biennial Pronghorn Workshop.
- Presentation - Comparison Between Pronghorn Age and Horn Size in Southern Alberta. Kim Morton, Paul F. Jones and Mike Grue at the 23rd Biennial Pronghorn Workshop.
- Presentation - Province and State Status Report on Pronghorn Antelope – 2008. Kim Morton**,** Paul Jones and John Taggart at the 23rd Biennial Pronghorn Workshop.
- Presentation - Role of population phenotype in ensuring resilient, abundant populations of pronghorn antelope. Michael J. Suitor, C. Cormack Gates, Paul Jones, Kyran Kunkel, Mike Grue, Julie Landry-DeBoer at the 23rd Biennial Pronghorn Workshop.
- Presentation – Alberta's prairie wildlife: living in a changing landscape given to the GRIP team meeting if Ag Canada, research scientists and Public Lands staff that highlighted pronghorn work.
- Presentation – Pronghorn conservation in Alberta given to Alberta Fish and Game during the briefing for the fence
- Paper - Winter Habitat Selection by Pronghorn at Multiple Scales in Southern Alberta. Paul F. Jones*, Mike Grue, Julie Landry-DeBoer, Mike Suitor, Cormack Gates, Dale Eslinger and Kim Morton in the 23rd Biennial Pronghorn Workshop proceedings.
- Paper - Landowner Knows Best: Local Ecological Knowledge of Pronghorn Habitat Use in Southern Alberta. Paul Jones, Mike Grue and Julie Landry-DeBoer in the 23rd Biennial Pronghorn Workshop proceedings.
- Paper - Comparison Between Pronghorn Age and Horn Size in Southern Alberta. Kim Morton, Paul F. Jones and Mike Grue in the 23rd Biennial Pronghorn Workshop proceedings.
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- Newspaper article - Losing a home on the range – in The Calgary Herald – January 9, 2009.
- Newspaper article - Highways limiting room to roam – in the National Post – January 10, 2009.
- Newspaper article - Highways, fences threaten migration – in The Regina Leader-Post – January 10, 2009.
- Newspaper article - Blocked from home on the range – in The Regina Leader-Post – January 9, 2009.
- Newspaper article - Antelope run out of room to roam – in The Edmonton Journal – January 10, 2009.
- Newspaper article - Fleet of foot, nowhere to go – in The Ottawa Citizen – January 10, 2009.
- Newspaper article - Highways, fences threaten migration paths of pronghorn antelope – in The Victoria Times Colonist – January 10, 2009.
- Newspaper article - International pronghorn antelope study expanding – newspaper article in the Great Falls Tribune – February 12, 2009. Highlights the capture event of February and the ongoing work with pronghorn under the Northern Sagebrush Steppe Initiative.
- Radio interview - CBC Radio 1 (Regina) – Discussion with project collaborator Cormack Gates on pronghorn habitat use and migration. Interview highlighted some of the key findings from the initial work completed in Alberta, specifically mentioning that ACA was behind the initiation of the work followed by a discussion of the work now ongoing under the Northern Sagebrush Steppe Initiaitve.

Literature cited

Barrett, M. W. 1982. Ranges, habitat, and mortality of pronghorns at the northern limits of their range. Ph.D. Thesis, University of Alberta, Edmonton. 226 pp.

Johnson, D. H. 1980. The comparison of usage and availability measurements for evaluating resource preference. Ecology. 61(1):65-71.

Yoakum, J. D. 2004. Habitat characteristics and requirements. *in* Pronghorn: ecology and management. Pages 409-445. Edited by B. W. O'Gara and J. D. Yoakum. Wildlife Management Institute, University Press of Colorado, Boulder, Colorado. 903 pp.