

Alberta Conservation Association 2016/17 Project Summary Report

Project Name: Pronghorn Resource Enhancement and Monitoring

Wildlife Program Manager: Doug Manzer

Project Leader: Paul Jones

Primary ACA staff on project: Paul Jones, Blair Seward and Mike Verhage

Partnerships

Alberta Fish & Game Association

Bushnell

Cabelas Canada

Canadian Forces Base Suffield

National Fish and Wildlife Foundation

Onefour Research Station

Safari Club International – Northern Alberta Chapter (Hunting Heritage Fund)

TD Friends of the Environment

The Nature Conservancy

University of Montana

World Wildlife Fund

Key Findings

- We prioritized key areas where fences limit pronghorn movement and shared this information with Alberta Fish & Game Association to guide fence modification work as part of their Pronghorn Antelope Travel Corridor Enhancement Project.
- In 2016/17, we processed trail-camera images from our fence crossing trials in winter 2015/16 at Canadian Forces Base Suffield in southern Alberta. Our results showed pronghorn as the most common species crossing fences, followed by elk, coyote and deer. We recorded more crossing events after the smooth wire was installed.
- We are collaborating on a companion project in Montana to improve migration and movement patterns with fence modifications tested over a longer time frame.
- An analysis of data from fence line modification work in Alberta and Montana over several years indicated that pronghorn preferentially selected for known crossing sites. Smooth wire appeared to be the most effective fence modification for pronghorn, followed closely by carabineers, which were used to clip the bottom wire to the wire above. White PVC pipe used to raise the bottom wire by clipping it to the wire above appeared to deter or impede movement by pronghorn.

Introduction

Having evolved on the prairies of North America, pronghorn (*Antilocapra americana*) have not developed an instinct to jump vertical obstacles. The proliferation of fencing that followed cattle ranching into Alberta poses a serious barrier to pronghorn movement (Gates et al. 2012). Pronghorn may cross under fence lines in some locations, but it slows down their movement making them susceptible to predators and in some cases strips hair off their back causing lacerations and making them vulnerable to infection and frostbite. Pronghorn also may become entangled in fences and perhaps become trapped and die (Jones 2014). A solution is to replace the bottom wire with smooth wire and move it up to 45 cm; however, this is expensive and takes a lot of effort. There are alternatives that should allow pronghorn to freely cross a fence, though most are in need of evaluation. We are identifying fences that need to be modified, exploring different ways to do this more efficiently, and increasing the public's understanding of the conservation challenges pronghorn face in Alberta.

Primary objectives for this work are to 1) map fence lines that inhibit pronghorn movement, 2) evaluate fence design alternatives to improve movement for pronghorn, 3) share our information with our partners, particularly those working to modify existing fence lines along key migration routes across the northern sagebrush steppe, and 4) increase the profile of pronghorn and communicate the conservation challenges they face in Alberta through presentations, publications and social media.

Methods

We met with interested landowners and Alberta Fish & Game Association (AFGA) to discuss modifying fences to make them pronghorn and wildlife friendly. We provided a map to AFGA that identified fence lines to be modified for each participating landowner; this information was used to help plan fence modification weekends and coordinate volunteers.

During the winter of 2015/16, we used 48 trail cameras to assess pronghorn use of smooth bottom wire placed at 45 cm from the ground on fence lines in Canadian Forces Base (CFB) Suffield. We removed all cameras from CFB Suffield on April 21, 2016, and began processing images. We classified images into six behaviours: 1) successfully crossed under, 2) successfully crossed over, 3) successfully crossed through, 4) failed attempt to cross, 5) lingering at the site, and 6) paralleling fence. We used a study design that looks at the difference before and after a treatment to determine if there was a difference in mean failed and mean successful attempts per day between the known crossing sites where the wire was lowered, known control sites where the wire was not lowered, modified sites (smooth wire) and control sites.

We began our winter 2016/17 trials in October 2016, deploying 32 trail cameras at known pronghorn crossing sites on CFB Suffield. The purpose of these trials was to assess how pronghorn react to sage grouse (*Centrocercus urophasianus*) reflectors and white PVC pipe on the top wire (visual marker for ungulates jumping over). We also continued our collaboration with the University of Montana and The Nature Conservancy in Montana to

improve migration and movement patterns of pronghorn using fence modifications tested over a longer time frame.

Results

After the removal of 48 trail cameras from CFB Suffield in April 2016, we processed all of the images from the cameras. Events of pronghorn were the most common, followed by elk (*Cervus elaphus*), coyote (*Canis latrans*) and deer (*Odocoileus* sp.) (Figure 1). Other species of interest detected were moose (*Alces alces*), golden eagle (*Aquila chrysaetos*), grouse (*Tympanuchus* sp.) and jack rabbits (*Lepus townsendii*). The number of events of our primary species predominately occurred after the installation of the smooth wire (Figure 2). Analysis of our fence trial data for all years in both the Alberta and Montana sites indicated that known crossing sites are preferentially used by pronghorn, with smooth wire being the preferred option of the three modifications evaluated. Goat-bars appeared to deter or impede pronghorn movement. Our results will be incorporated into a manuscript for peer-reviewed publication.

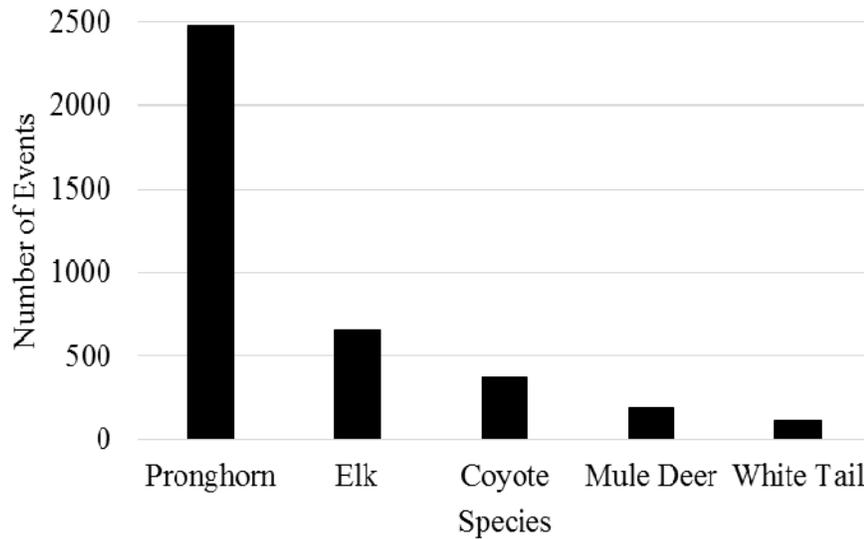


Figure 1. Number of events of various species pronghorn, elk, white-tailed deer, mule deer and coyotes captured by 48 trail cameras on Canadian Forces Base Suffield as part of the fence modification evaluation project, October 2015 to April 2016.

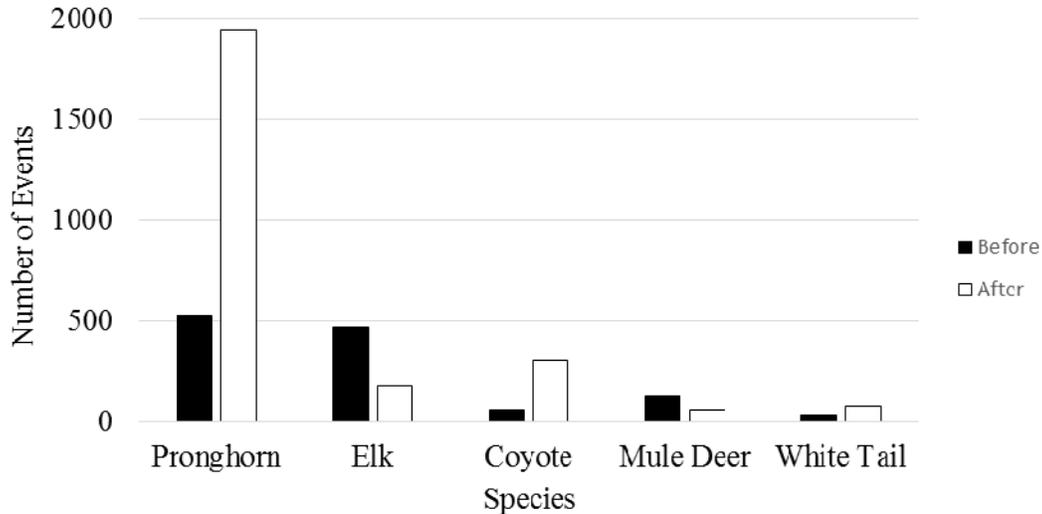


Figure 2. Number of events per priority species before (black bars) and after (white bars) the installation of the smooth bottom wire captured by trail cameras on Canadian Forces Base Suffield as part of the fence modification evaluation project, October 2015 to April 2016.

Conclusions

Pronghorn predominately cross under a fence, but if the bottom wire is too low the fence becomes a barrier. Pronghorn appear to be using existing “known” sites for crossing fences; and evidence of preferential crossings at modification locations is weak thus far. That said, of the modifications tested, smooth wire appears to best facilitate crossings, followed closely by carabineers. White PVC pipe appears to be detrimental to crossing by pronghorn and may even hinder crossing. Pronghorn acceptance of modified crossing sites may be a learned behaviour that develops over time with visual sight cues. Results from field studies in Montana may help identify how long it takes for pronghorn to become comfortable using modified sites. As results become available, information will be disseminated to stakeholders, wildlife managers and conservation groups to support efforts to restore movement patterns that have been relied on for thousands of years by pronghorn.

Communications

Publications

- Jakes, A., C.C. Gates, N.J. DeCesare, P.F. Jones, J.F. Goldberg, M. Hebblewhite, and K. Kunkel. Classifying the migration behaviors of pronghorn on their northern range. *Journal of Wildlife Management* (in review).
- Jones, P.F., J.A. Hurly, C. Jensen, K. Zimmer, and A. Jakes. Diel and monthly movement rates by migratory and resident female pronghorn. *The Prairie Naturalist* (in review).

- Burkholder, E., A. Jakes, P.F. Jones, M. Hebblewhite, and C. Bishop. To jump or not to jump: mule deer and white-tailed deer crossing decisions. *Wildlife Society Bulletin* (in preparation).
- Jones, P.F., A. Jakes, M. Hebblewhite, B. Martin, B. Seward, and D. Eacker. To cross or not to cross? Evaluating responses to fence modifications by pronghorn and cattle across the Northern Great Plains. *Journal of Wildlife Management* (in preparation).

Presentations

- Evaluating the use of modified fence sites by pronghorn in Alberta. (P. Jones) – Prairie Conservation Forum, June 23, 2016 (50 people).
- Prairie fences: reason to be concerned or just part of the landscape? (P. Jones) – 27th Biennial Pronghorn Workshop, August 30, 2016 (97 people).
- Evaluating the use of modified fence sites by pronghorn in the Northern Sagebrush Steppe. (P. Jones, A. Jakes, B. Martin, and M. Hebblewhite) – 27th Biennial Pronghorn Workshop, August 30, 2016 (97 people).
- To jump or not to jump: mule deer and white-tailed deer crossing decisions. (E. Burkholder, A. Jakes, P. Jones, M. Hebblewhite, and C. Bishop) – 27th Biennial Pronghorn Workshop, August 30, 2016 (97 people).
- Wildlife-friendly fence designs. (P. Jones) – Ranching Opportunities Conference, Olds College, February 9, 2017 (120 people).

Key Contacts

- Dr. Mark Hebblewhite – University of Montana
- Dr. Andrew Hurley – University of Lethbridge (retired)
- Dr. Andrew Jakes – University of Montana (Post-doc)
- Christine Paige – Ravenworks Ecology
- Dr. Carl Schwarz – Simon Fraser University

Literature Cited

Gates, C.C., P. Jones, M. Sutor, A. Jakes, M.S. Boyce, K. Kunkel, and K. Wilson. 2012. The influence of land use and fences on habitat effectiveness, movements and distribution of pronghorn in the grasslands of North America. Pages 277–294. *In*: M.J. Somers and M. Hayward, editors. *Fencing for conservation: restrictions of evolutionary potential or a riposte to threatening processes?* Springer-US, New York, New York USA.

Jones, P.F. 2014. Scarred for life; the other side of the fence debate. *Human-Wildlife Interactions* 8: 150–154.

Photos



“Hey, baby, what are you eating?”—a male pronghorn exhibiting flehmen behaviour or lip curl to check estrous status of female. Photo: Alberta Conservation Association



Bull elk lining up to cross a fence. Photo: Alberta Conservation Association



Pronghorn male with one horn sheath shed and one still intact. Photo: Alberta Conservation Association



Blair Seward of Alberta Conservation Association clearing tumbleweeds from a fence line while checking trail cameras. Photo: Alberta Conservation Association