

**Alberta Conservation Association  
2019/20 Project Summary Report**

**Project Name:** Pronghorn Movement and Enhancement (Fence Trials)

**Wildlife Program Manager:** Doug Manzer

**Project Leader:** Paul Jones

**Primary ACA staff on project:** Charmaine Brunes, Mike Jokinen, Paul Jones, Amanda MacDonald, Margaret Neufeld, and Scott Vegter

**Partnerships**

Alberta Environment and Parks

Alberta Fish & Game Association

Bushnell

Cabelas Canada

Canadian Forces Base Suffield

Montana Department of Transportation

National Fish and Wildlife Foundation

National Wildlife Federation

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 processed trail-camera images from our fence-crossing trials taken from July 2018 to February 2020 at Canadian Forces Base Suffield in southern Alberta and the Matador Ranch in eastern Montana. Pronghorn were the most common species attempting to cross fences, followed by mule deer and white-tailed deer.
- When successfully crossing a fence, pronghorn and mule deer predominately did so by crossing under the bottom wire. White-tailed deer crossed the fence by either going under or over, while elk crossed predominantly by going over the top wire.
- Sage grouse reflectors and white polyvinyl chloride (PVC) pipe on the top wire do not impact the movement across fences by pronghorn, mule deer, or white-tailed deer. Our paper has been accepted for publication in *Wildlife Society Bulletin*.

## **Abstract**

Having evolved on the wide-open prairies of North America, pronghorn did not develop an instinct to jump vertical obstacles. The proliferation of fencing that followed cattle ranching since the 1880s now poses a serious barrier to pronghorn movement. 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. Between 2018 to the present, we evaluated fence modifications proposed for ungulates to make crossing over a fence easier to assess the modifications' potential impact on pronghorn and deer fence-crossing behaviours. We have processed all images from the cameras up until February 2020. In addition, between 2016–2018 we determined that sage-grouse reflectors and white polyvinyl chloride (PVC) pipe on the top wire do not act as visual barriers and therefore do not impact the movement across fences by pronghorn, mule deer, or white-tailed deer. Our results from this study will be published in the journal, *Wildlife Society Bulletin*. As results become available, we will disseminate our conclusions to stakeholders, wildlife managers, and conservation groups.

## **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) test whether lowering the top wire facilitates deer crossing over fences while not impeding the movement of pronghorn; 2) finalize the publication on our evaluation of fence modifications proposed for ungulates and sage grouse (*Centrocercus urophasianus*) and the potential impact these modifications might have on pronghorn and deer (*Odocoileus sp.*) fence-crossing success; 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 began our fence-modification field trials in July 2018, deploying 30 trail cameras at known pronghorn crossing sites on CFB Suffield. The purpose of these trials was to assess how pronghorn and deer react to modifications installed on fences to lower the top wire.

We also continued our collaboration with the University of Montana and The Nature Conservancy in Montana by deploying 20 cameras on the Matador Ranch in October 2018. We processed all images from Alberta and Montana until February 2020. 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 at control sites (known-crossing sites left unchanged) to those with modifications (either carabiners or white pvc pipe on the top two wires) to determine if there was a difference in mean failed and mean successful attempts per day. We used a mixed-effect ANOVA, generalized linear models, and time-to-event analysis techniques to assess the impacts of the modifications on pronghorn and deer crossing behaviour.

## Results

For both Alberta and Montana combined, crossing instances of pronghorn were the most common, followed by mule deer (*O. hemionus*), white-tailed deer (*O. virginianus*), coyote (*Canis latrans*), and elk (*Cervus elaphus*) (Figure 1). Other notable species detected were moose (*Alces alces*), burrowing owl (*Athene cunicularia*), bobcat (*Lynx rufus*), and badger (*Taxidea taxus*). Pronghorn and mule deer predominantly crossed a fence by going under. For white-tailed deer it varied between crossing under versus over, and elk predominantly crossed over the top wire (Figure 2). We submitted and had accepted our paper from the previous analysis showing that sage grouse reflectors and the white PVC pipe on top did not affect pronghorn, mule deer, or white-tailed deer's ability to cross a fence in the journal *Wildlife Society Bulletin*.

## Conclusions

Our work has created an increased awareness of the impacts fences have on prairie wildlife. Our studies of proposed fence modifications are the first real scientific evaluation of modifications to test whether they increase fence permeability for pronghorn and deer. We have demonstrated that carabiners and smooth wire on the bottom facilitate passage by pronghorn and deer under the bottom wire. We have also determined that placing sage-grouse reflectors and white PVC pipe on the top wire does not impede the movement of pronghorn or deer. As further 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.

Figure 1. Number of events detected by species captured by remote trail cameras at known crossing sites on CFB Suffield, Alberta (black bar) and the Matador Ranch, Montana (grey bar), July 2018–February 2020.

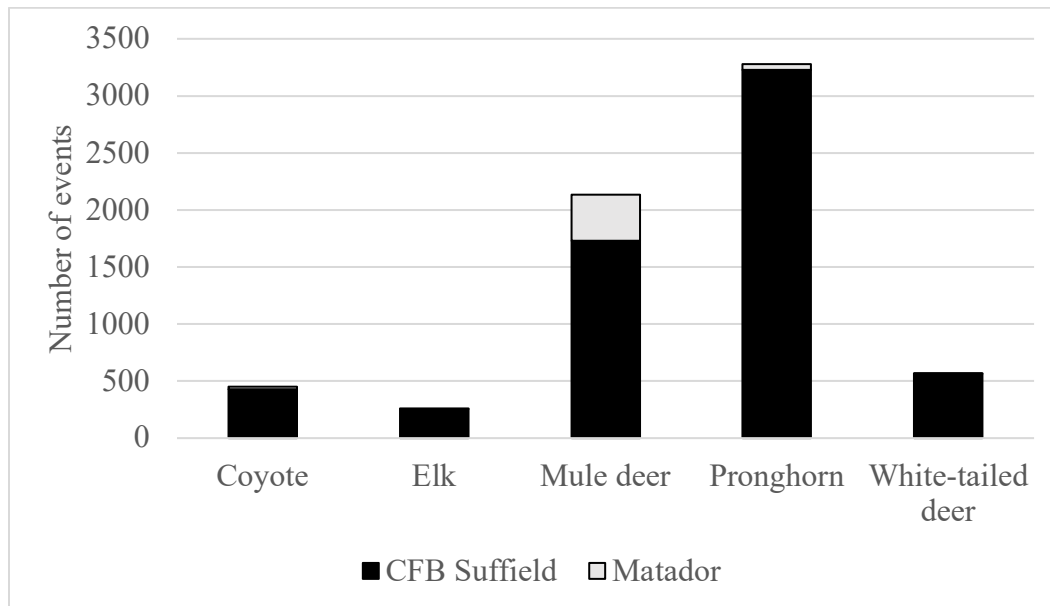
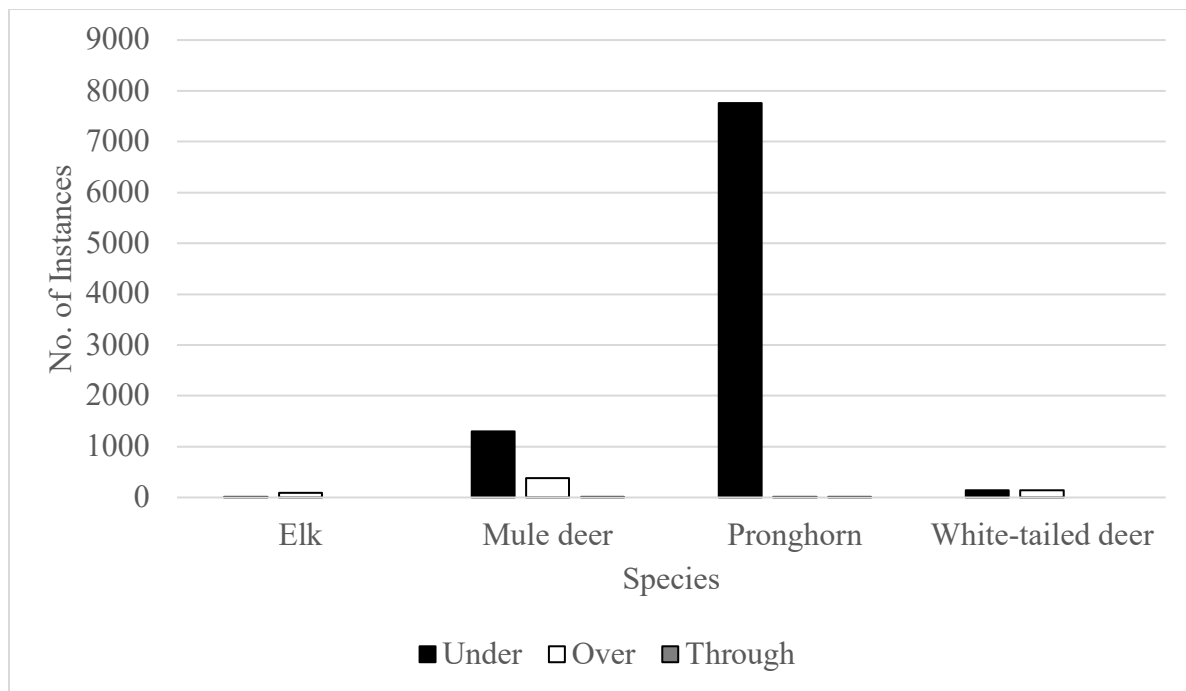


Figure 2. Number of instances of successful fence crossings by method (over, under, or through) at known crossing sites by four ungulates on CFB Suffield, Alberta and the Matador Ranch, Montana, July 2018–February 2020.



## **Communications**

### **Publications:**

- Jones, P.F., A. Jakes, A. McDonald, J. Hanlon, D. Eacker, B. Martin, and M. Hebblewhite. 2020. Evaluating responses by sympatric ungulates to fence modifications across the Northern Great Plains. *Wildlife Society Bulletin*. <https://doi.org/10.1002/wsb.1067>.

### **Presentations:**

- Fences: reason to be concerned or just part of the landscape. (P. Jones) – Crown of the Continent Roundtable, September 26, 2019 (26 people).

### **Key Contacts:**

- Dr. Mark Hebblewhite – University of Montana
- Dr. Andrew Jakes – National Wildlife Federation
- 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



Cow moose crosses at a known crossing site, but not without difficulty as she catches her hind legs on the top wires. Fortunately, she does not get hung-up and safely crosses the fence.  
Photo: ACA





An image of a burrowing owl perched on a fence captured by a trail camera on CFB Suffield.  
Photo: ACA



A Magpie, captured on a trail camera in the spring, collecting fur from the ground to use as nesting material. Photo: ACA