

**Alberta Conservation Association
2018/19 Project Summary Report**

Project Name: Pronghorn Movement and Enhancement (Fence Trials)

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Project Leader: Paul Jones

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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 November 2016 to April 2018 at Canadian Forces Base Suffield in southern Alberta and the Matador Ranch on eastern Montana. Pronghorn were the most common species attempting to cross fences, followed by mule deer, and white-tailed deer.
- 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.
- When successfully crossing a fence, pronghorn, mule deer, and white-tailed deer did so predominately by crossing under the bottom wire

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) evaluate 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, 2) share our information with our partners, particularly those working to modify existing fence lines along key migration routes across the northern sagebrush steppe, and 3) 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 trials in October 2016, deploying 31 trail cameras at known pronghorn crossing sites on CFB Suffield. The purpose of these trials was to assess how pronghorn react to sage grouse 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, The Nature Conservancy, and National Wildlife Federation in Montana by deploying 29 cameras on the Matador Ranch. We processed all images from Alberta and Montana. 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 sage grouse reflectors or white pvc pipe) 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 a time-to-event analysis techniques to assess the impacts of the modifications on pronghorn and deer crossing behavior.

Results

In Alberta, crossing instances of pronghorn were the most common, followed by mule deer (*O. hemionus*), and white-tailed deer (*O. virginianus*) (Figure 1a). In Montana, crossing instances of pronghorn were the most common followed by mule deer (Figure 1b). We did not record any crossing attempts by white-tailed deer in Montana. Pronghorn always successfully crossed a fence by going under, while for both mule deer and white-tailed deer it varied between crossing under versus over (Figure 2). However, though it varied on method used, both deer species preferred to cross under than over a fence at the known-crossing sites (Figure 2). Our analysis indicates 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.

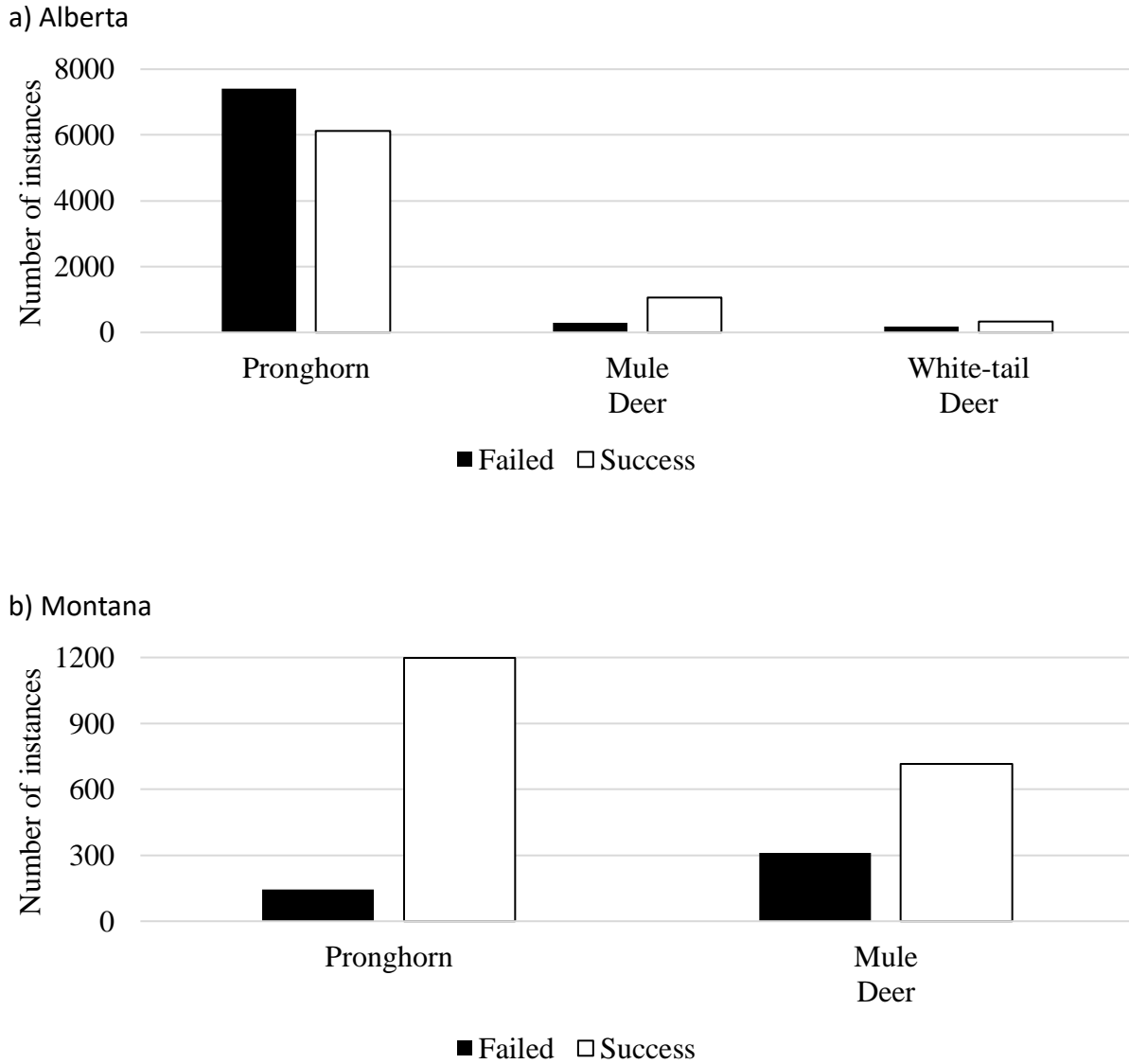


Figure 1. Number of failed and successful crossing instances captured by remote trail cameras at known-crossing sites by three ungulates on CFB Suffield, Alberta (a) and the Matador Ranch, Montana (b), October 2016 – April 2018. Note, we did not record any crossing attempts by white-tailed deer in Montana.

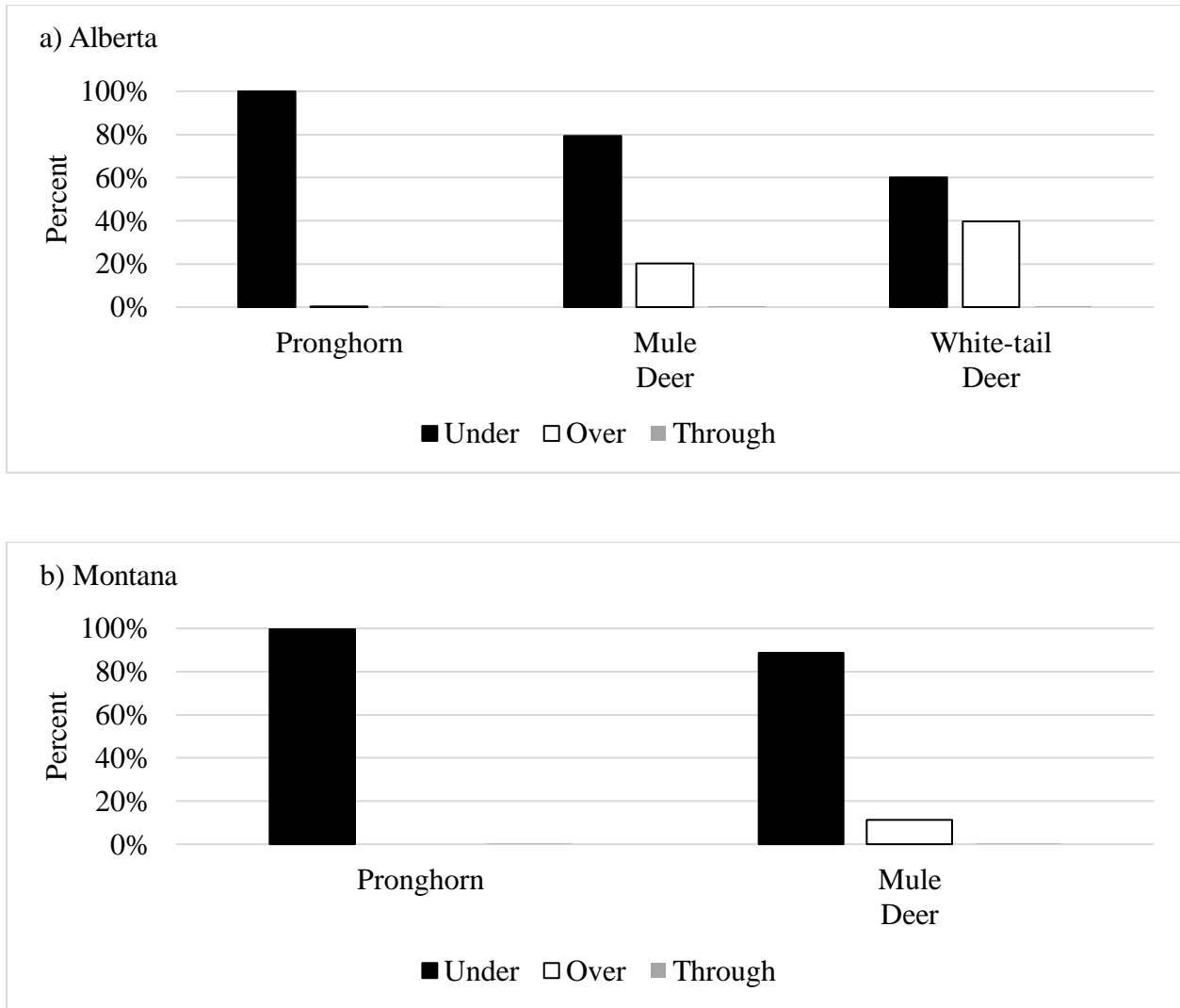


Figure 2. Percentage of successful fence crossings by method (over, under, or through) at known-crossing sites by three ungulates on CFB Suffield, Alberta (a) and the Matador Ranch, Montana (b), October 2016 – April 2018. Note, we did not record any crossing attempts by white-tailed deer in Montana.

Conclusions

Sage grouse protection is a predominant issue facing the conservation world in North America. One of the conservation tools regularly employed is the use of sage grouse reflectors on fences around leks. Our results show that placing these reflectors (as well as the white PVC pipe on the top wire) does not impede the movement of pronghorn (or deer). The difference in the proportion of successful to failed attempts between the two study areas by pronghorn is likely due to most of the fences in Montana being wildlife-friendly while those in Alberta were not. Our results also show that both deer species prefer crawling under the bottom wire to cross a fence, which speaks to the energetics and risk factor imposed on deer when jumping a fence. 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

- Jones, P.F., A. Jakes, D. Eacker, B. Seward, M. Hebblewhite, and B. Martin. 2018. Evaluating responses by pronghorn to fence modifications across the Northern Great Plains. *Wildlife Society Bulletin* 42:225-236.
- Jakes, A., C.C. Gates, N.J. DeCesare, P.F. Jones, J.F. Goldberg, K. Kunkel, and M. Hebblewhite. 2018. Classifying the migration behaviors of pronghorn on their northern range. *Journal of Wildlife Management* 82:1229-1242.
- Burkholder, E., A. Jakes, P.F. Jones, M. Hebblewhite, and C. Bishop. 2018. To jump or not to jump: mule deer and white-tailed deer crossing decisions. *Wildlife Society Bulletin* 42:420-429.
- Jones, P.F., A. Jakes, A. McDonald, J. Hanlon, D. Eacker, B. Martin, and M. Hebblewhite. 2019. Evaluating responses by sympatric ungulates to fence modifications across the Northern Great Plains. *Wildlife Society Bulletin* (under review).

Presentations

- Pronghorn: nomads of the prairies. (P. Jones) – Lethbridge Naturalists, February 13, 2019 (19 people).

Media

- Article on Wildlife Society Bulletin website titled "Which wildlife-friendly fences work for pronghorn?" (D. Kobilinsky) – <http://wildlife.org/wsb-which-wildlife-friendly-fences-work-for-pronghorn/>, May 21, 2018.

Key Contacts

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



Two pronghorn cross at a known-crossing site that has been modified by placing a piece of white polyvinyl chloride (PVC) pipe on the top wire to increase the visibility of the fence.

Photo: ACA



A group of pronghorn cross at a known-crossing site that has been modified by placing sage grouse reflectors on the top and third wire to increase the visibility of the fence.

Photo: ACA



Nice try, I see you! A ferruginous hawk stalking a jack rabbit in an attempt to get dinner.

Photo: ACA