

Alberta Conservation Association
2018/19 Project Summary Report

Project Name: Pronghorn – Grassland Indicator

Wildlife Program Manager: Doug Manzer

Project Leader: Paul Jones

Primary ACA staff on project: Charmaine Brunet and Paul Jones

Partnerships

Alberta Environment and Parks

Montana Department of Transportation

National Fish and Wildlife Foundation

National Wildlife Federation

Sagebrush Science Initiative (a collaboration between the US Fish and Wildlife Services and Western Association of Fish and Wildlife Agencies)

Sage Grouse Initiative

The Nature Conservancy

University of Montana

Key Findings

- Paper titled “A fence runs through it: a call for a discipline of fence ecology.” published in *Biological Conservation* (P. F. Jones second author).
- Draft paper titled “Fences reduce habitat for a partially migratory ungulate in the Northern Sagebrush Steppe.” submitted to *Ecosphere* for consideration (P. F. Jones lead author)

- Draft paper titled “Beyond protected areas: private lands and public policy anchor critical migratory pathways across avian and terrestrial migrants.” submitted to *Biological Conservation* (P. F. Jones coauthor).

Introduction

The Northern Sagebrush Steppe (NSS) is the northern terminus of sagebrush steppe and grassland habitats and is also the northern range limit for a variety of species. Through multiple anthropogenic pressures, native prairie continues to be converted and fragmented across the region and as a result, increased stress on wildlife populations and overall ecosystem function occurs. In planning, surrogate species may be selected whose life-history requirements, sensitivity to impacts, spatial range, or position in public perception act as a barometer of ecosystem function. Pronghorn (*Antilocapra americana*) are an iconic prairie species whose life-history attributes require them to range over the longest distances of any ungulate in the NSS. In the NSS, 55% of pronghorn migrate between seasonal ranges (Jakes et al. 2018). For other wildlife species in this system, maintaining connectivity between seasonal ranges and core habitats is vital in mitigating environmental and anthropogenic pressures. Because pronghorn are well-distributed across the landscape, move and operate at large landscape scales, are sensitive to both environmental and anthropogenic pressures, and are highly regarded in public perception, we hypothesize that they can serve as an umbrella for other sagebrush steppe and grassland species at the periphery of their range (sage grouse [*Centrocercus urophasianus*]), grassland birds, and waterfowl).

Primary objectives for this work are to 1) test the efficacy of pronghorn as an umbrella species for sage grouse, grassland birds, and waterfowl, 2) combine these elements into a hierarchically strategic approach using identified seasonal range and migration pathway priorities for multiple species, and 3) develop an article for publication creating awareness of the impacts of fences on wildlife and the need for greater attention on the impacts fences have on wildlife and ecosystems.

Methods

We will use resource-selection function models to predict multi-scale pronghorn seasonal (summer/winter) range across the NSS, which provides spatial outputs of both multi-scale seasonal range habitats and migration pathways for pronghorn. This approach will produce a seasonal range and migration corridor map for prioritizing pronghorn conservation that can be used as a design for managing important pronghorn seasonal range and corridor habitats in other systems.

We will also test the suitability of pronghorn as an umbrella species by using pre-existing map outputs for other species, pronghorn seasonal ranges, and migration pathway maps and overlaying them using GIS with seasonal range and migration pathway maps for sage grouse, as well as core habitats for grassland birds and waterfowl. This approach will identify overlapping seasonal range and migration corridors for identified sagebrush steppe and grassland species in the NSS, which will target priority areas for management and conservation. This leads to building a hierarchical strategy to prioritize fence mitigation efforts spatiotemporally within these prioritized seasonal range and corridor habitats, which overall, preserves connectivity throughout the NSS.

Results

Seasonal ranges for pronghorn have been developed and resource selection models (logistic regression) were completed with and without fence covariates. Models without a fence covariate serve as a base line, while the inclusion of a fence covariate allowed us to assess the impact fences have on pronghorn selection patterns. A draft manuscript on the effects of fences on the resource selection by pronghorn is currently under review. A draft manuscript comparing the migration pathways and proportion of pathway overlap between pronghorn and sage grouse has been completed and manuscript is currently under review. We continue to work on the assessment of pronghorn as an indicator species for a suite of grassland species, with the goal of submitting a manuscript for publication in March 2019. Lastly, a manuscript identifying the

hazards fences pose for wildlife and the need for greater attention to the effects fences have on wildlife and ecosystems has been published in *Biological Conservation*.

Conclusions

The use of indicator species is not new to conservation. Pronghorn may be an appropriate indicator species for the NSS and for grasslands across North America. Reception by landholders to the conservation of pronghorn and grassland habitat may result in benefits to listed species at risk such as sage grouse, grassland birds, and waterfowl. As results from our work become available, information will be disseminated to stakeholders, wildlife managers, and conservation groups to support efforts to restore and conserve movement patterns and grassland habitats.

Communications

Publications

- Jakes, A., P.F. Jones, C. Paige, R.G. Seidler, and M.P. Huijser. 2018. A fence runs through it: a call for greater attention to the influence of fences on wildlife and ecosystems. *Biological Conservation* 227:310-318.
- Tack, J. D., A. F. Jakes, P. F. Jones, J. T. Smith, R. E. Newton, B. Martin, M. Hebblewhite, and D. E. Naugle. 2019. Beyond protected areas: Private lands and public policy anchor intact pathways for multi-species wildlife migration. *Biological Conservation* 234:18-27.
- Jones, P.F., A.F. Jakes, A.C. Telander, H. Sawyer, B. Martin, and M. Hebblewhite. 2019. Fences reduce habitat for a partially migratory ungulate in the Northern Sagebrush Steppe. *Ecosphere* (not yet published as of time of writing).

Presentations:

- Modeling the response of pronghorn to varying degrees of fencing on the landscape. (P. Jones) – 28th Biennial Pronghorn Workshop, August 15, 2018 (70 people).
- Beyond protected areas: private lands and public policy anchor intact pathways to multispecies wildlife migration. (A. Jakes) – 28th Biennial Pronghorn Workshop, August 15, 2018 (70 people).

Key Contacts

- Mark Hebblewhite – University of Montana
- Marcel P. Huijser, Western Transportation Institute – Montana State University
- Andrew Jakes – University of Montana (Post-doc)
- David Naugle – University of Montana
- Christine Paige – Ravenworks Ecology
- Hal Sawyer – Western Ecosystems Technology, Inc.
- Renee Seidler – Idaho Department of Fish and Game
- Jason Tack – US Fish and Wildlife Service
- Andrew Telander – Western Ecosystems Technology, Inc.

Literature Cited

Jakes, A., C.C. Gates, N.J. DeCesare, P.F. Jones, J.K. Goldberg, K. Kunkel, and M. Hebblewhite. 2018. Classifying the migration behaviors of pronghorn on their northern range. *Journal of Wildlife Management*. 82:1229-1242.

Photos



A group of pronghorn getting ready to make their fall migration south.
Photo: Paul Jones



Male sage grouse dancing on a lek. Photo: Mike Jokinen



Brewer's sparrow calling from its perching spot on a piece of grass.
Photo: Julie Landry-DeBoer