Alberta Conservation Association

2019/20 Project Summary Report

Project Name: Pronghorn – Grassland Indicator

Wildlife Program Manager: Doug Manzer

Project Leader: Paul Jones

Primary ACA staff on project: Charmaine Brunes, Paul Jones, and Scott Vegter

Partnerships

Alberta Environment and Parks
Center for Large Landscape Conservation
Miistakis Institute
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 British Columbia
University of Montana

Key Findings

- Three papers published in peer-reviewed journals, of which P. F. Jones was lead author on one and co-author on two.

- Two papers drafted and submitted for consideration to peer-reviewed journals. P. F. Jones lead author on one and co-author on the second. Both papers are under revision based on reviews from the journals.
- One paper is at the draft stage and will be submitted to *Conservation Science and Practice* journal in late winter or early spring 2020.

Abstract

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. For 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. We published three papers, have an additional two papers under consideration, and have drafted another paper that will be submitted in late winter/early spring 2020. We continue to work on the assessment of pronghorn as an indicator species for a suite of grassland species. 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.

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 (greater 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) increase the profile of pronghorn and communicate the conservation challenges they face in Alberta through publications, presentations, and social media.

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. Our results were published in the peer-reviewed journal, *Ecosphere* (P. F. Jones – lead author). We have begun to examine if pronghorn are an appropriate indicator species by first comparing the migration pathways of pronghorn to those of greater sage-grouse; our results were published in the peer-reviewed journal, *Biological Conservation.* Lastly, we have increased the profile of pronghorn and their conservation needs by publishing or submitting papers to peer-reviewed journals for consideration. First, we collaborated on a large-scale assessment of large-bodied terrestrial mammal migration worldwide and published the results in *Scientific Reports* (P. F. Jones – co-author). We submitted a paper to the *Journal of Wildlife Management* on the impacts of winter severity on pronghorn survival (P. F. Jones – lead author), and a second paper on the multi-scale migratory habitat selection to *PlosOne* (P. F. Jones – co-author). Lastly, we assisted in the drafting of a paper for submission in late winter or early spring 2020 to *Conservation Science and Practice* examining the use of wildlife connectivity models as a tool to prioritize road sections to improve human safety and wildlife movement (P. F. Jones – co-author).

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:

- 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 10: e02782.
- Joly, K., E. Gurarie, M.S. Sorum, P. Kaczensky, M.D. Cameron, A.F Jakes, B.L. Borg, D. Nandintsetseg, J.G.C. Hopcraft, B. Buuveibaatar, P.F. Jones, T. Mueller, C. Walzer, K.A. Olson, J.C. Payne, A. Yadamsuren, and M. Hebblewhite. 2019. Longest terrestrial migrations and movements around the world. Scientific Reports 9: 15333.
- Tack, J.D., A.F. Jakes, P.F. Jones, J.T. Smith, R.E. Newton, B.H. 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, D.R. Eacker, and M. Hebblewhite. 2020. Impact of severe winter weather on pronghorn (Antilocapra americana) in a partially migratory population. Journal of Wildlife Management (under revision).
- Jakes, A.F., N.J. DeCesare, P.F Jones, C.C. Gates, S.J. Story, S.K. Olimb, K.E. Kunkel, and M. Hebblewhite. 2020. Multi-scale assessment of migration habitat for pronghorn. PlosOne (under revision).
- Lee, T., T. Creech, A. Martinson, S. Neilson, A.F. Jakes, P.F. Jones, K. Sanderson, and A. Ford. 2020. Widening the lens: prioritization of road sections to improve human safety and wildlife connectivity along a provincial road network. Conservation Science and Practice (in draft).

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:

- Tyler Creech – Center for Large Landscape Conservation
- Mark Hebblewhite – University of Montana
- Andrew Jakes – National Wildlife Federation
- Kyle Joly – National Park Service
- Tracy Lee – Miistakis Institute
- David Naugle – University of Montana
- Hal Sawyer – Western Ecosystems Technology, Inc.
- 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 pronghorn buck foraging in the lush vegetation found along a highway. Photo: Paul Jones

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