Alberta Conservation Association
2017/18 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 Mike Verhage

Partnerships

Alberta Environment and Parks
National Fish and Wildlife Foundation
Sage Grouse Initiative
The Nature Conservancy
University of Montana
Western Association of Fish and Wildlife Agencies

Key Findings

- Drafted paper titled "A fence runs through it: a call for a discipline of fence ecology." for submission to *Conservation Biology* (P. F. Jones second author).
- Drafted paper titled "Beyond protected areas: private lands and public policy anchor critical migratory pathways across avian and terrestrial migrants." for submission 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 habitat 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 percent 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 a new disciple called fence ecology.

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 an initial habitat selection model was developed using a Bayesian approach. The Bayesian approach did not produce consistant results as hoped and therefore have begun to construct the RSF models using standard approaches (logistic regression). Models will be completed by spring 2018. Pronghorn and sage grouse migratory pathways have been overlaid and analysis of overlap is complete. A draft manuscript comparing the migration pathways and proportion of pathway overlap has been completed and will be submitted in 2018. Lastly, a manuscript identifying the hazards fences pose for wildlife and the need for a new disciple, similar to road ecology, called fence ecology has been drafted and submitted to *Conservation Biology* for consideration.

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., 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. In press.
- Jakes, A., P.F. Jones, C. Paige, R.G. Seidler, and M.P. Huijser. A fence runs through it: a call for a discipline of fence ecology. Conservation Biology (draft).
- Tack, J.D., A.F. Jakes, M. Hebblewhite, P.F. Jones, J.T. Smith, and David E. Naugle. Beyond protected areas: private lands and public policy anchor critical migratory pathways across avian and terrestrial migrants. Biological Conservation (draft).

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. In press

Photos

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

Sage grouse male dancing on a lek. Photo: Mike Jokinen

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