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Pronghorn: Northern Sagebrush Steppe, Alberta, Canada

Migration Description

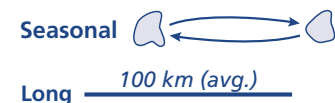
Pronghorn in southern Alberta live at the northern periphery of the species range, where they make transboundary migrations into Saskatchewan and across the Canada-United States border. Pronghorn numbers were significantly reduced at the beginning of the 20th century due to human settlement, overharvesting, and severe winters, but since then, conservation efforts have allowed pronghorn to gradually rebound, now remaining stable between 16,000-20,000. Their long-term persistence is tied to native prairie habitats. During fall, pronghorn rapidly migrate to areas with more abundant silver sagebrush, their primary winter food source. During spring migration, pronghorn follow the green-up of vegetation, typically northward, to their fawning and summer ranges. Pronghorn also make facultative migrations, adapting to extreme conditions by moving from one winter range to another to access forage. Pronghorn in Alberta do not typically follow established corridors, but instead use multiple pathways that can vary from year to year. Pronghorn that winter near the border with Montana migrate north for the summer towards Medicine Hat, while pronghorn that typically spend the summer months 140 km north in central Alberta use this area as a winter range. In 2004, a female made the longest-recorded migration for the species, traveling from Manyberries, Alberta north to her summer range, into Saskatchewan and back for a total distance of 888 km.

Threats to Migration

Alberta's pronghorn migrations face compounding anthropogenic threats. Native prairie continues to be lost and highly fragmented through intensive farming, creating a checkerboard of prairie habitats and agricultural fields. Pronghorn also tend to avoid all forms of roads, whether fenced or not. The Trans-Canada highway, a four-lane high speed corridor that is paralleled by a set of railroad tracks and fences in certain sections, bisects pronghorn range in Canada. While not a complete barrier to migration, the Trans-Canada highway does hinder movement and causes animal-vehicle collisions (Fig. 1). Fences further fragment Alberta's sagebrush steppe, often delaying pronghorn as they detour to areas where they have learned they can cross. Because pronghorn prefer to crawl under fences, they need ample space to squeeze underneath the bottom wire. When snow is deep, fences that are typically semi-permeable in other conditions can trap pronghorn, resulting in mass die-offs (Fig. 2). Energy development may also constrain pronghorn movements. Both wind and solar energy projects have been developed within these traditional north-south migration routes. Research is therefore urgently needed to unravel how incremental anthropogenic development across migration routes will affect the sustainability of pronghorn movements that are critical for maintaining these populations at the northern periphery of the species' range.

Local Population Facts

Migration



Threats

-  Climate change
-  Energy dev.
-  Urban sprawl
-  Linear barriers
-  Agriculture
-  Livestock
-  Illegal killing
-  Other

Species Facts

Common name: Pronghorn

Species name: *Antilocapra americana*

Range: Prairie habitats of North America

Diet: Mixed-feeder herbivore

Global population: 750,000

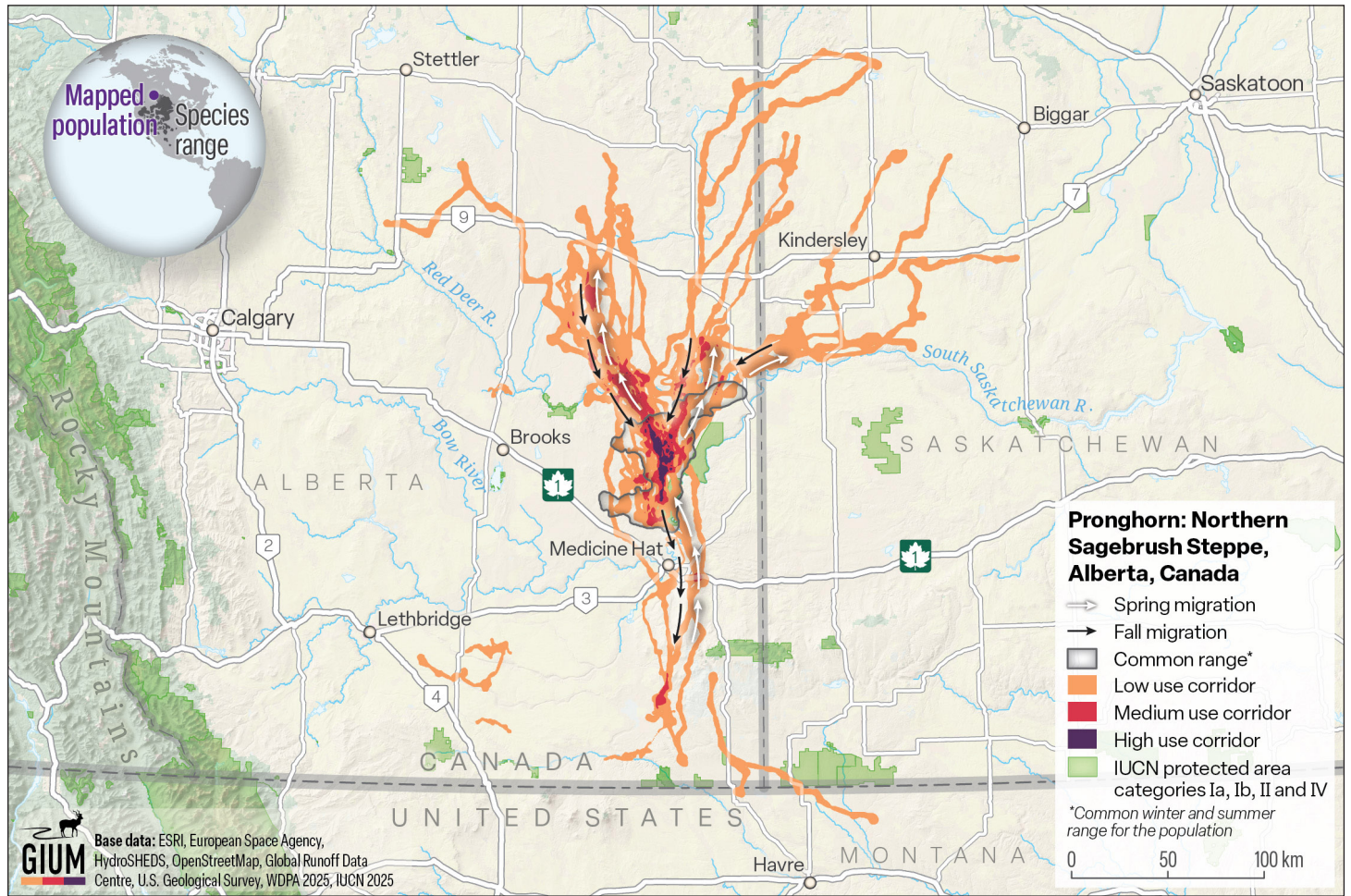
IUCN Conservation Status

LC Least concern

CMS Status

Not listed

Pronghorn Migration



Study Information

Sample size

74 females, 27 migratory

Relocation frequency

4 hours

Project duration

2003–2007

Data Analysis

Delineation of migration periods

Net squared displacement for spring and fall migrations

Models derived from

Brownian Bridge Movement Model

Route Summary

Migration start and end date (median)

- Spring: March 22–April 10
- Fall: October 31–November 10

Average number of days migrating

- Spring: 20 days
- Fall: 11 days

Migration route length

- Min: 8 km
- Mean: 100 km
- Max: 350 km

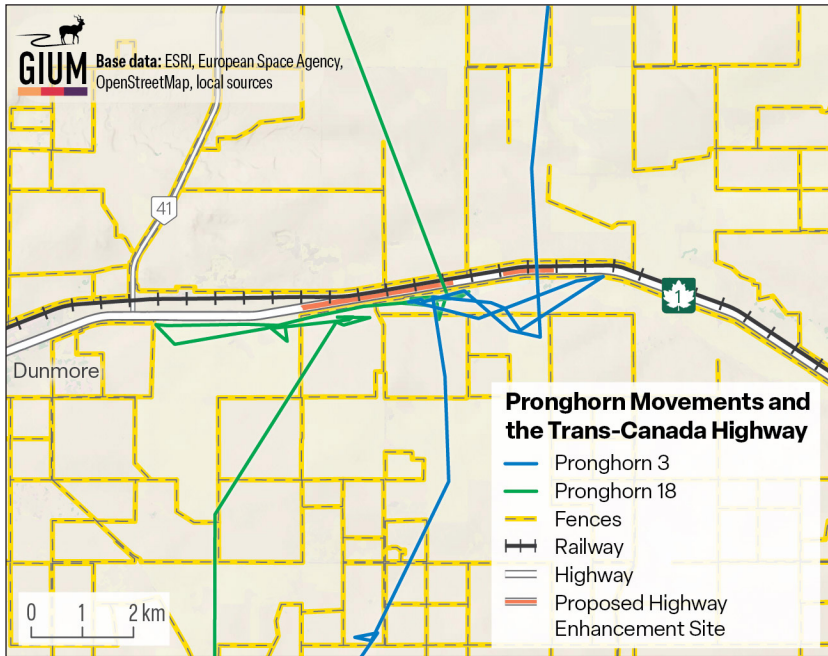
Data Providers

Data were collected and evaluated through the efforts of Paul Jones with the Alberta Conservation Association and Andrew Jakes then with the University of Calgary. Funding for this project was provided by the Alberta Antelope Guides, Alberta Conservation Association, Alberta Fish and Game Association (Zone 1), Alberta Parks and Recreation, Alberta Professional Outfitters Society (Legacy Fund and Wildlife Management Fund), Canadian Forces Base Suffield, Foundation for North American Wild Sheep – Eastern Chapter, Safari Club International, Safari Club International Alberta Chapter, and Safari Club International Northern Alberta Chapter (Hunting Heritage Fund). The spatial data on proposed road enhancement sites were provided by the Pronghorn Xing team consisting of Miistakis Institute, Alberta Conservation Association and Canadian Wildlife Federation.

In partnership with:

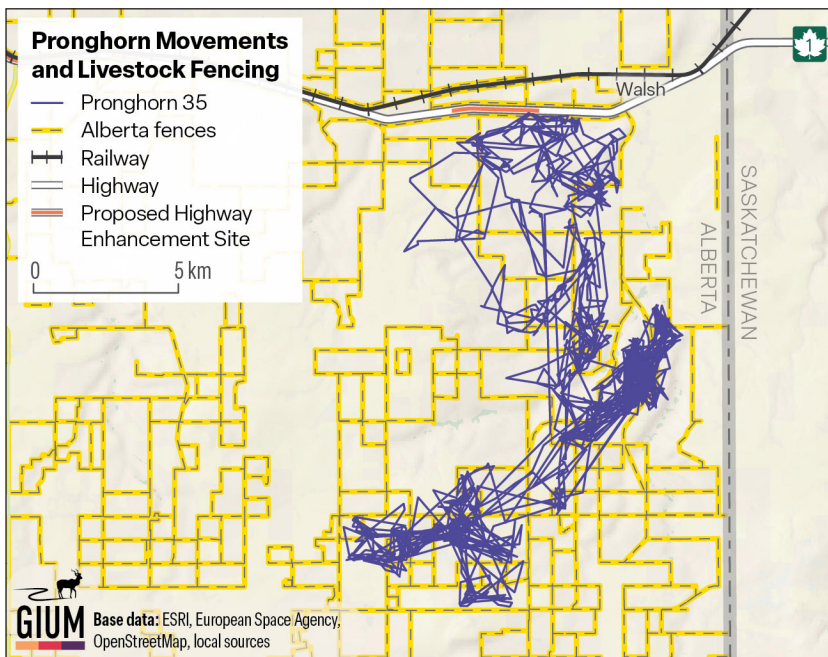


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Figure 1: Pronghorn movements in relation to the Trans-Canada Highway. Trans-Canada transportation corridor is fenced on both sides and bordered by a set of railroad tracks on the north side. The combination of all three linear features significantly impedes pronghorn movements in certain sections. For example, P3 (blue) spent three days moving back and forth on the south side of the highway during her spring migration before she was able to cross and continue her journey north. The Pronghorn Xing coalition has proposed highway enhancement sites (orange bars) consisting of overpasses (preferred by pronghorn) or underpasses to both move pronghorn quickly across the highway and to address motorist safety concerns. The sites were selected based on an analysis using citizen scientists' pronghorn observation data, a pronghorn connectivity model based on GPS collar data, and animal-vehicle collision data.



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Figure 2: Pronghorn movements are highly influenced by livestock fencing on the landscape. Pronghorn encounter many fences as they move, seeking forage or refuge from winter conditions. Pronghorn 35's movement throughout the year was heavily influenced by the distribution of fences, and further restricted by the Trans-Canada highway to the north and a gravel county road to the south. Her tracks illustrate several areas where she traveled parallel to the fence and was unable to cross. Fence density in southern Alberta poses a significant challenge to pronghorn. Pronghorn predominantly cross under fences, which often results in animals sustaining injuries due to hair loss and deep scratches along the back, rump and neck areas. When snow accumulates, fences that were once easily crossed become semi-permeable or impermeable, resulting in even greater injuries or deaths. At times, the fences trap pronghorn in deep snow, resulting in mass die-offs.

