UNIVERSITY OF TORONTO MISSISSAUGA

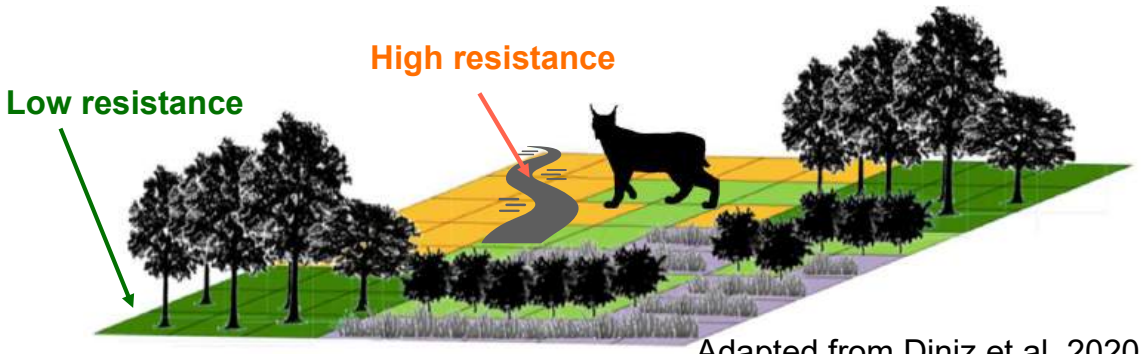
Miistakis Institute

Species-specific applied connectivity conservation

Ninon Meyer & Tracy Lee

Species-specific connectivity

- Explicitly considers the responses of the species to the landscape structure



Adapted from Diniz et al. 2020

Species-specific connectivity

- Explicitly considers the responses of the species to the landscape structure
- **Varies with habitat needs, movement capability, individual-behaviour, movement scale (e.g. home range versus migration)**

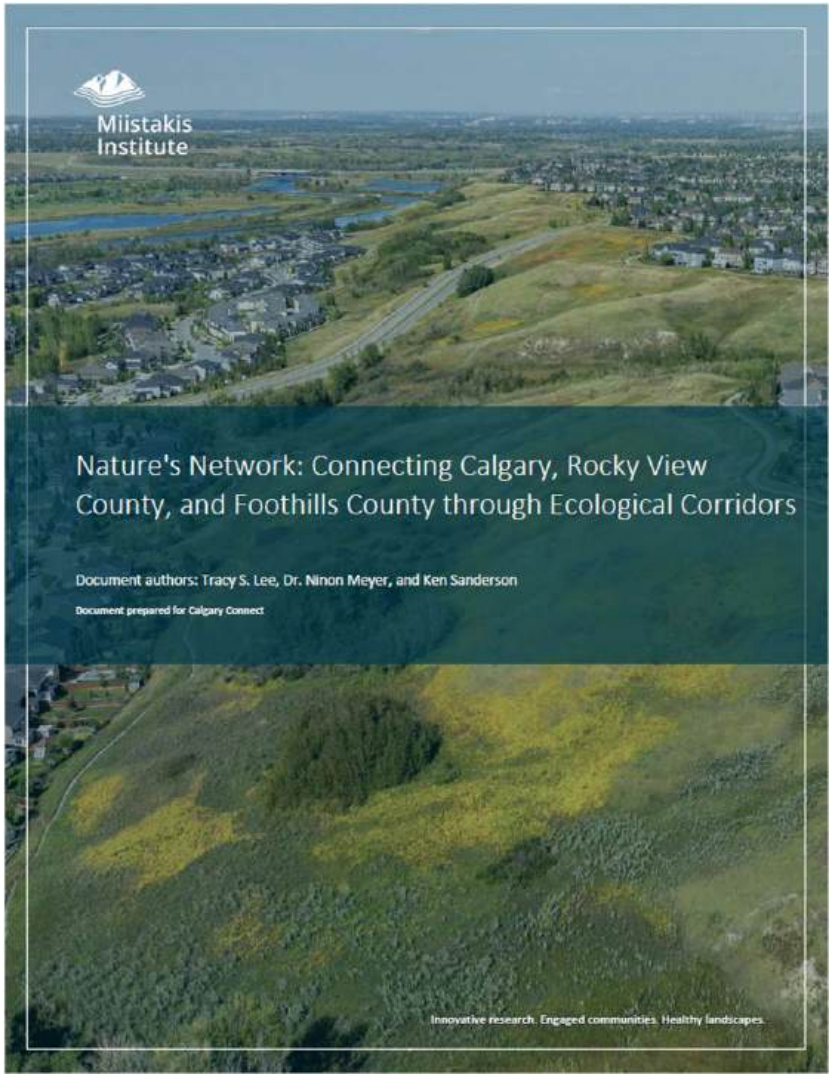
Species-specific connectivity

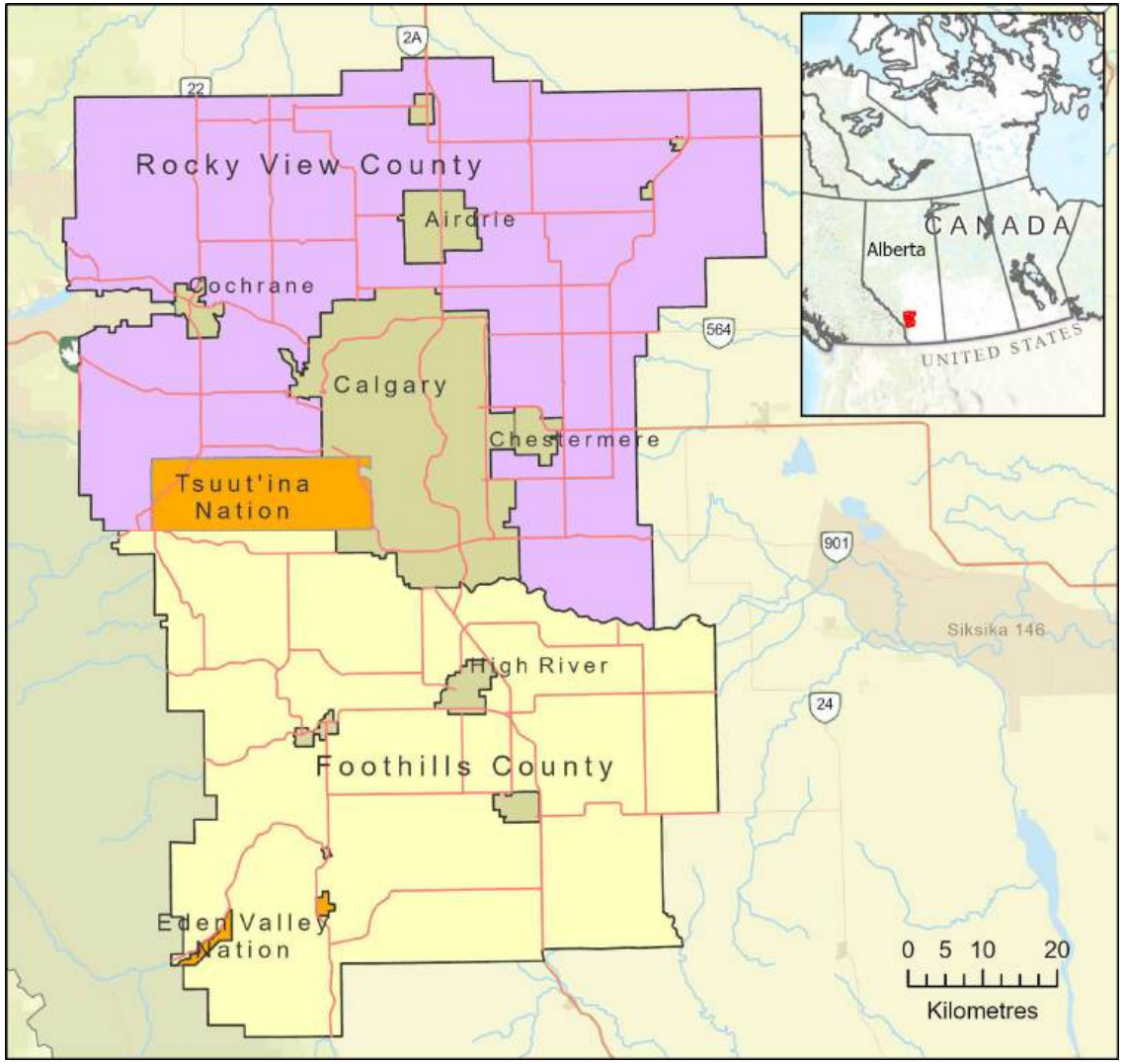
- Explicitly considers the responses of the species to the landscape structure
- Varies with habitat needs, movement capability, individual-behaviour, movement scale (e.g. home range versus migration)
- **Connectivity outputs differ with species : no one size fits all**




Application of species-specific connectivity in southern Alberta

Case 1: Integrate connectivity planning in the municipalities around Calgary

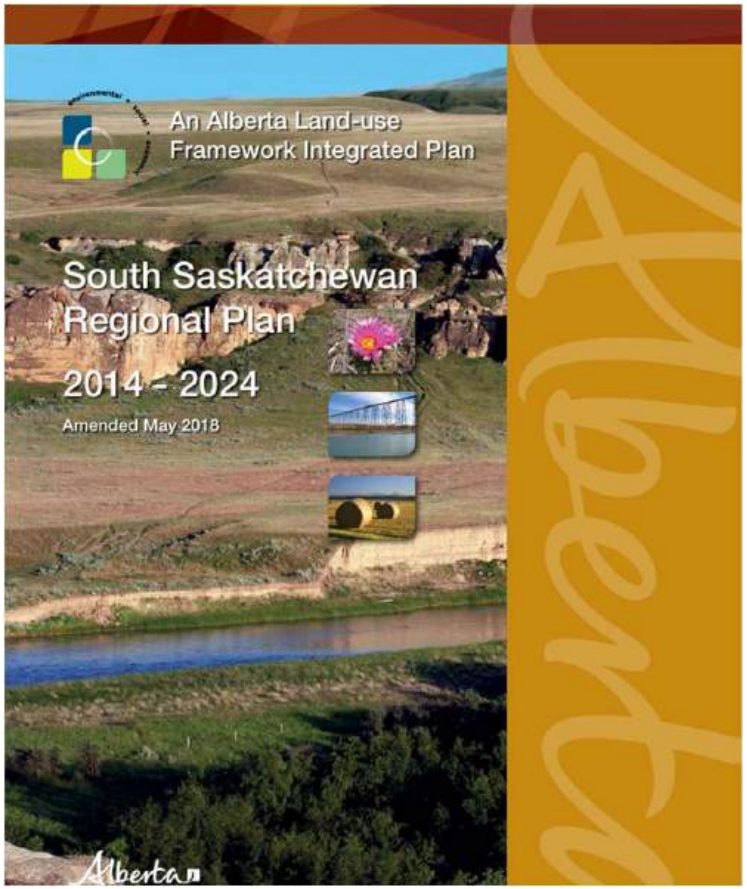

Miistakis Institute
Nature's Network: Connecting Calgary, Rocky View County, and Foothills County through Ecological Corridors
Document authors: Tracy S. Lee, Dr. Ninon Meyer, and Ken Sanderson
Document prepared for Calgary Connect
Innovative research. Engaged communities. Healthy landscapes.


2A
22
Rocky View County
Airdrie
Cochrane
564
Calgary
Chestermere
Tsuut'ina Nation
901
Siksika 146
High River
24
Foothills County
Eden Valley Nation
0 5 10 20
Kilometres
CANADA
Alberta
UNITED STATES

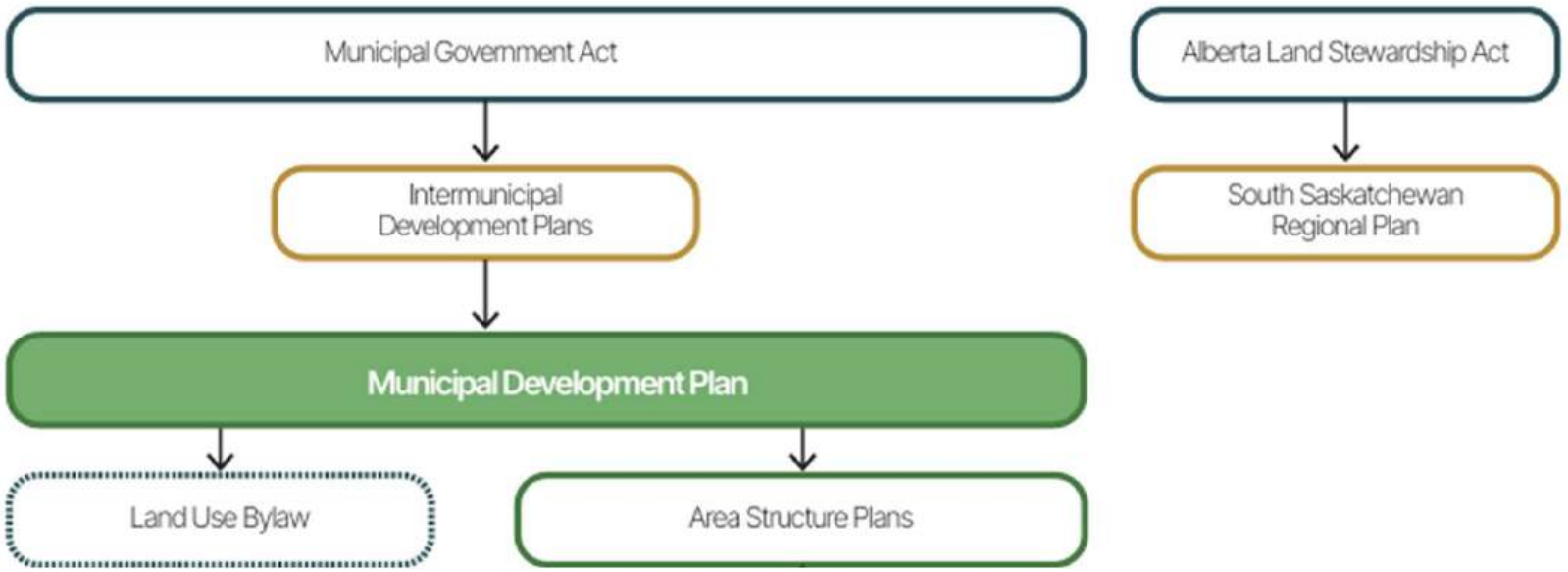
Supportive Provincial Policy

Alberta Land Stewardship Act (ALSA) is the legal authority to implement the province's Land Use Framework and directs the preparation of regional plans. ALSA provides direction and leadership by identifying objectives of the Government regarding land use, economics and the environment.

South Saskatchewan Regional Plan (SSRP) speaks broadly to "connectivity of wildlife habitat" (p 57) which provides opportunity for municipalities to integrate policies around connectivity into their planning documents



County Level Governance



Extracted from Rocky View County MDP

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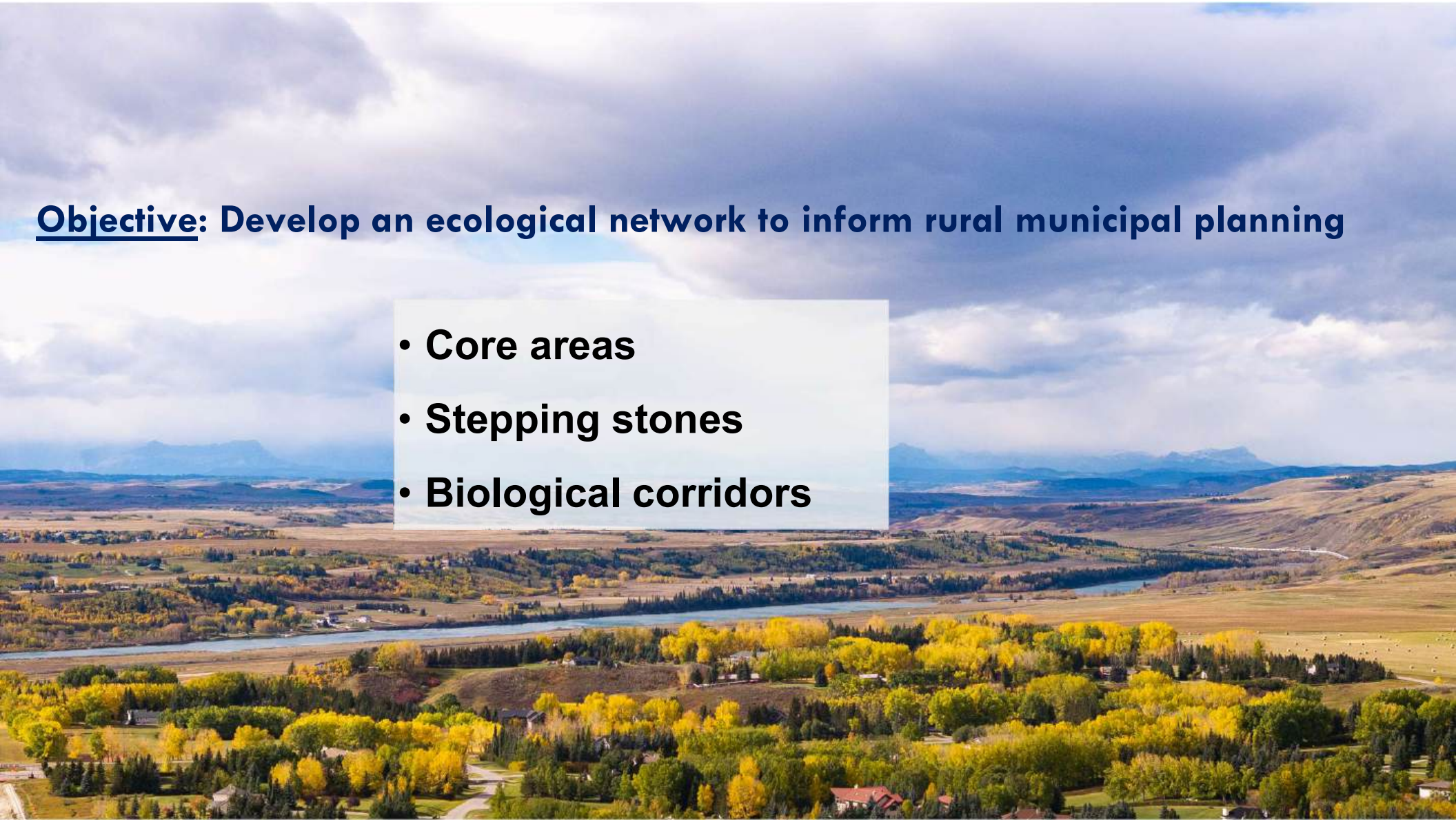
Objective: Develop an ecological network to inform rural municipal planning

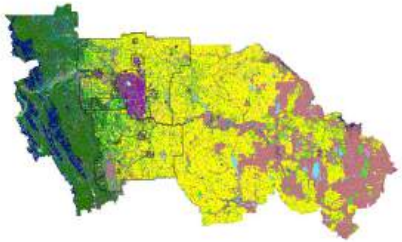


Objective: Develop an ecological network to inform rural municipal planning

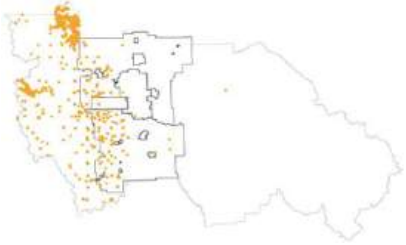
- Core areas
- Stepping stones
- Biological corridors

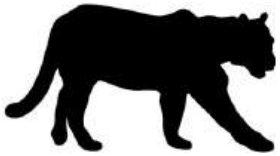
Modeling the ecological connectivity

Land cover

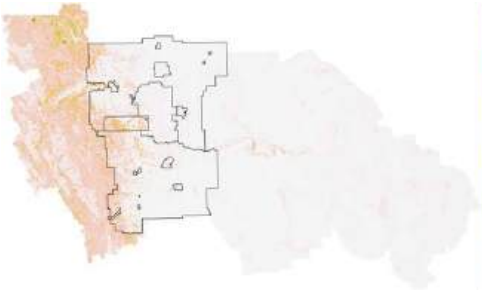


Occurrence data

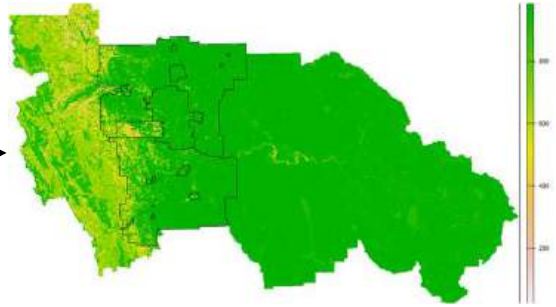


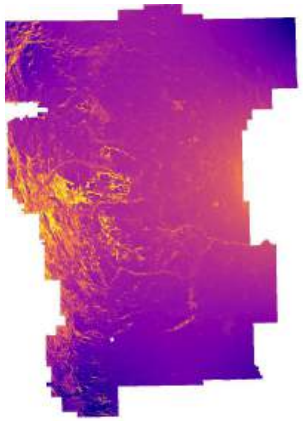


Habitat suitability



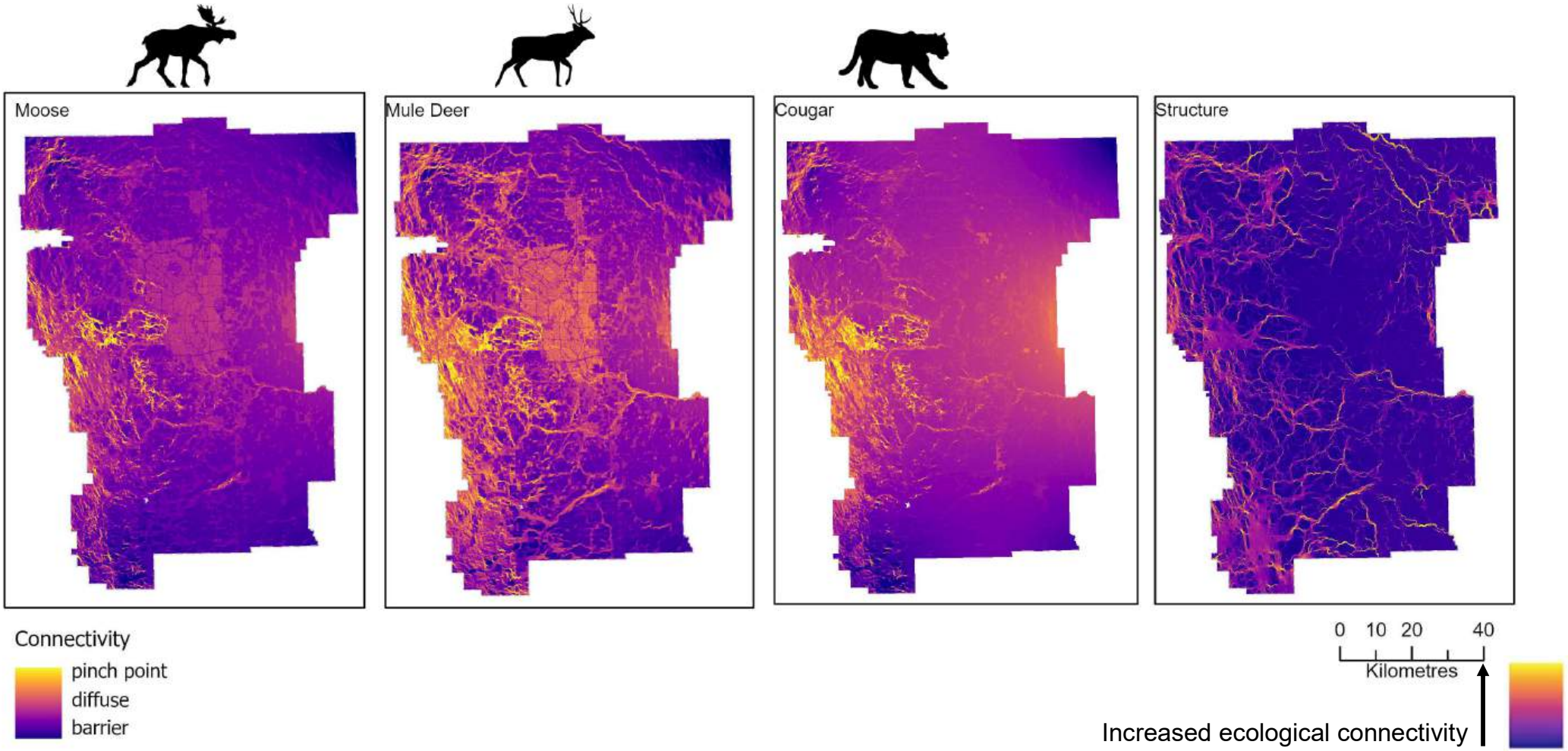
Landscape resistance



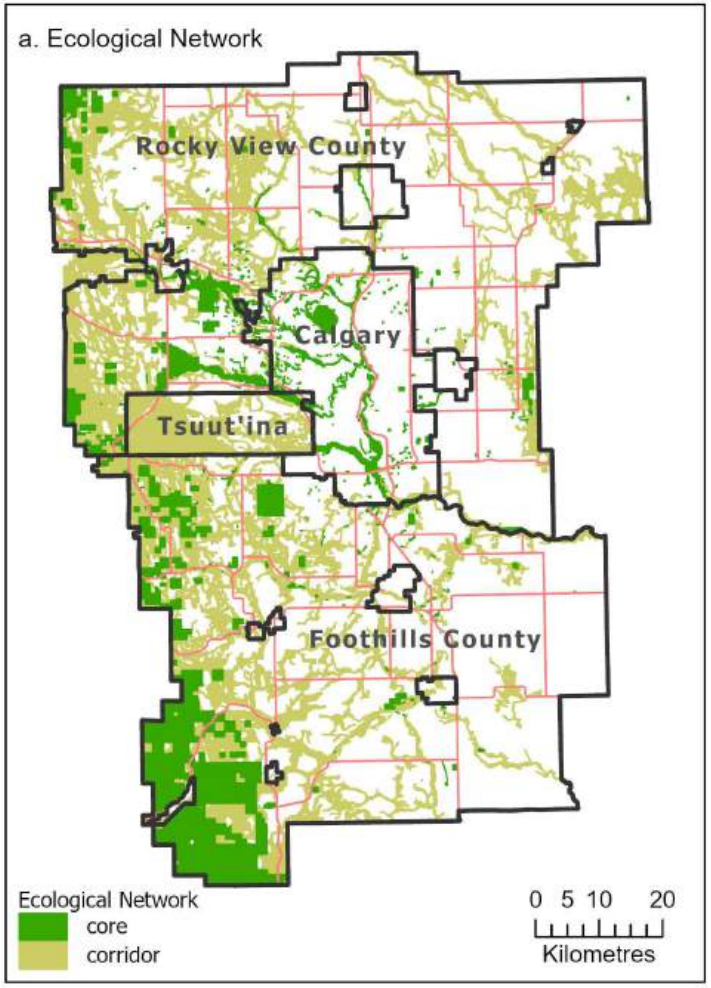


Circuit theory

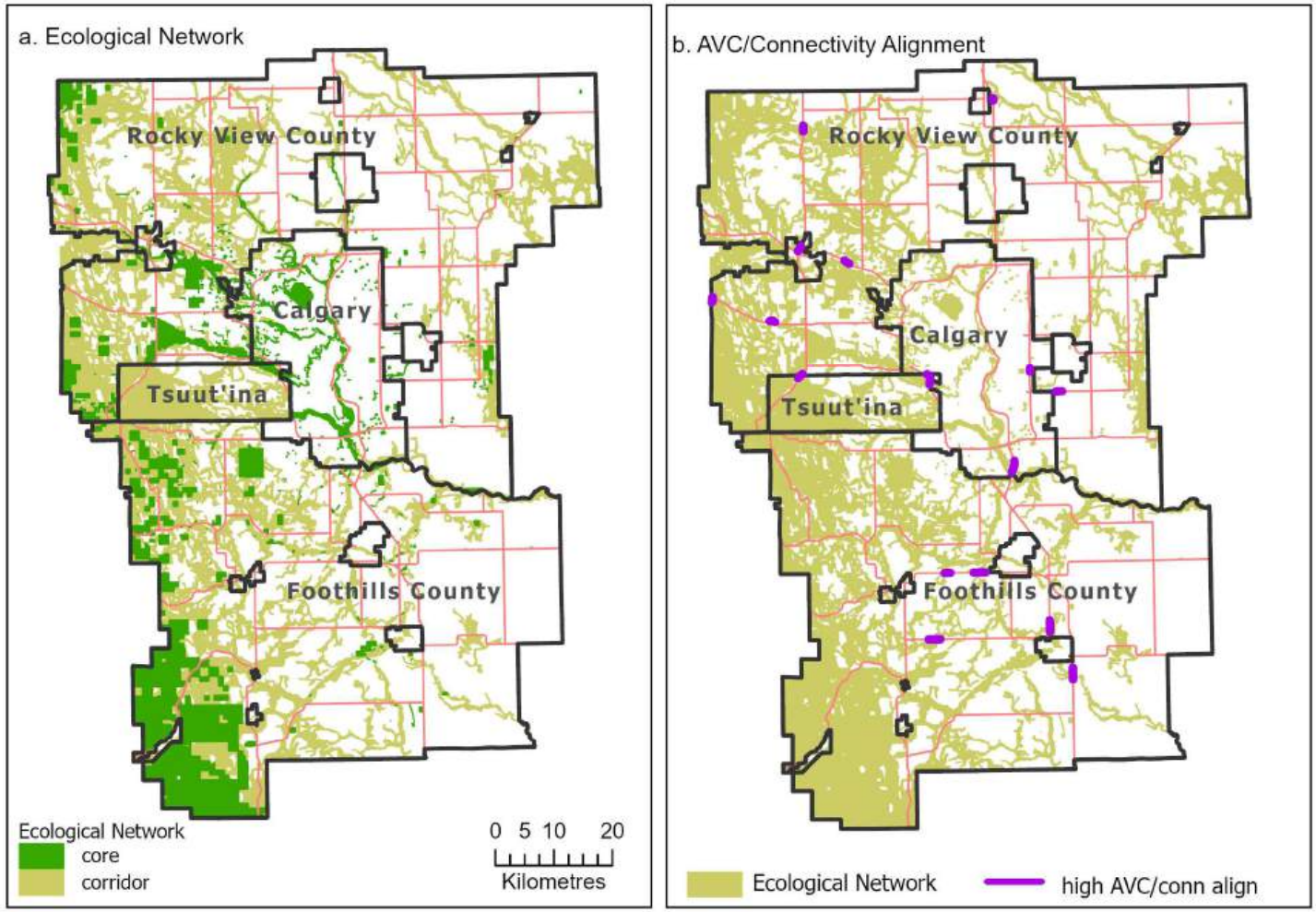
Species-specific & structural ecological connectivity



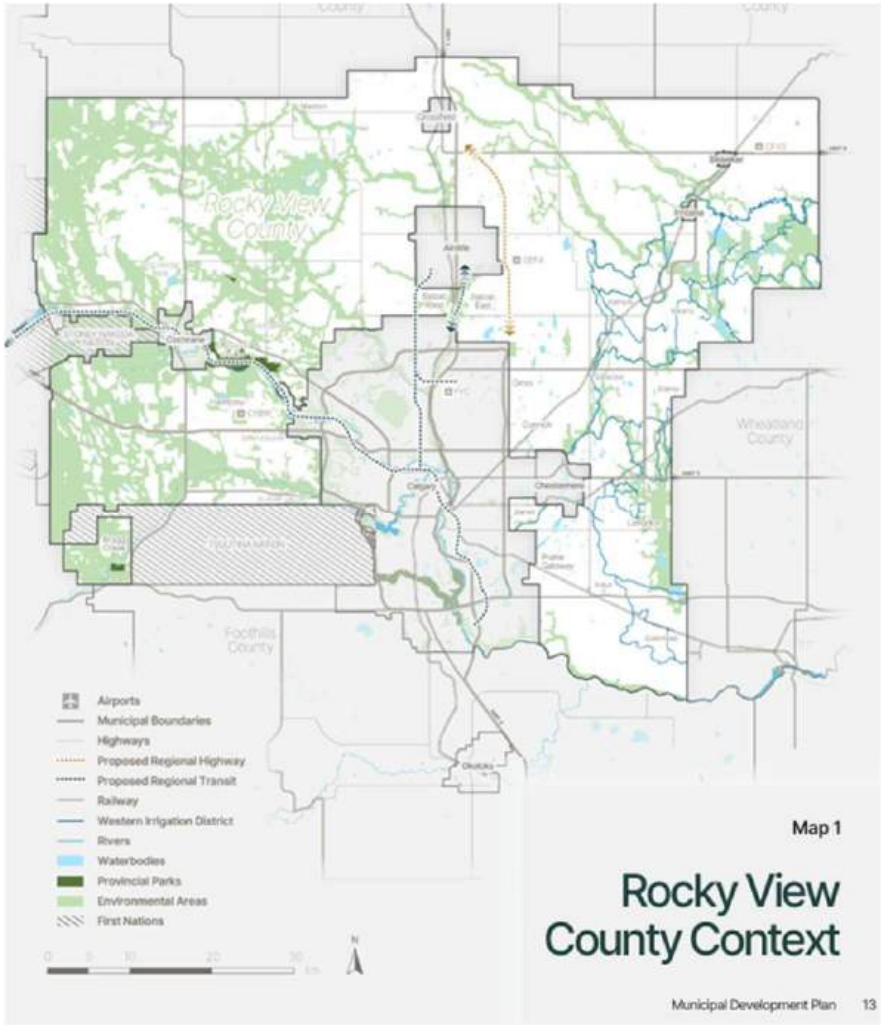
Delineation of an ecological connectivity network



Delineation of an ecological connectivity network



The EN was successfully integrated into RVC MDP

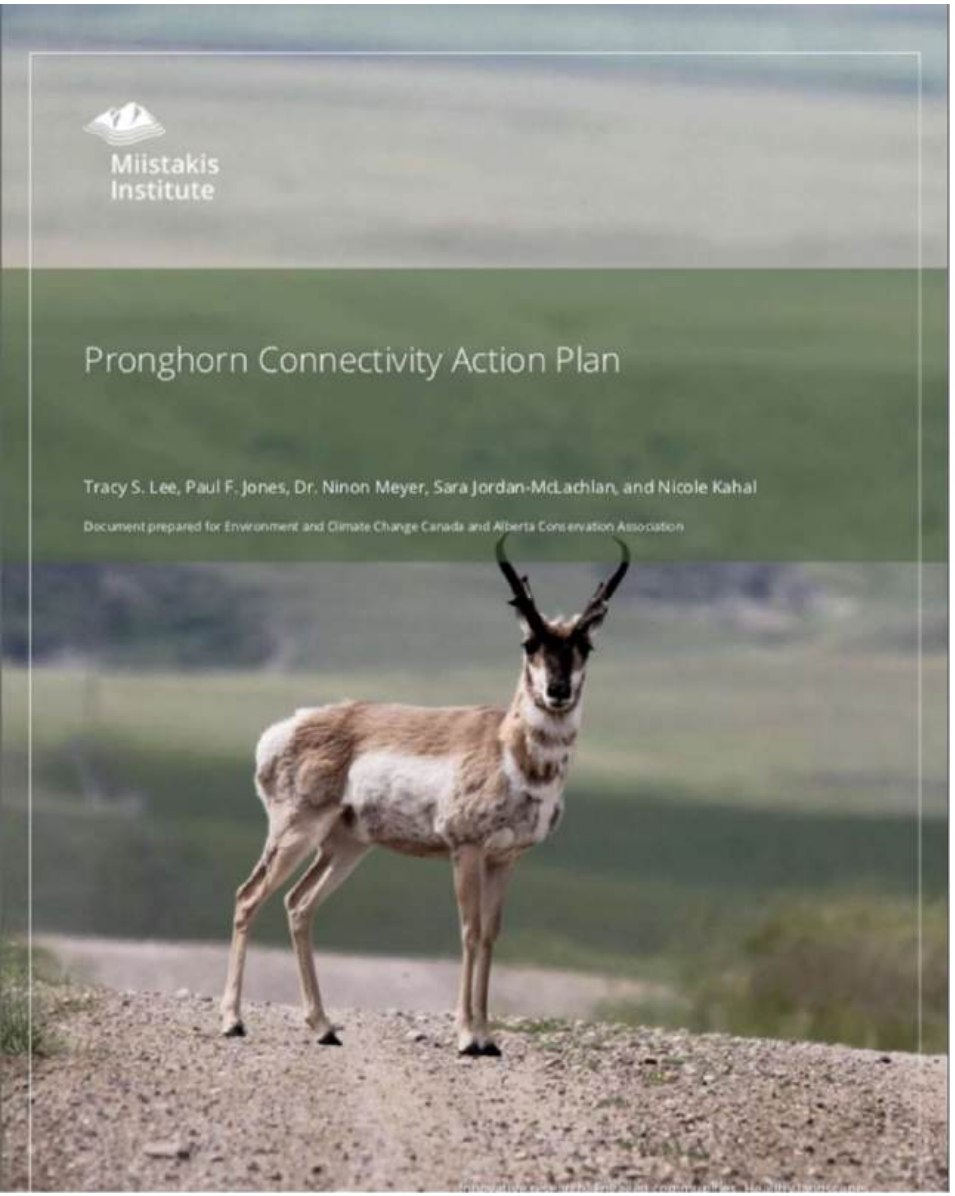


Focused growth is essential to maintain Environmental Areas (as shown on Map 5: Natural Systems) and the health of natural systems. Development in the County should minimize land disturbance, preserve Environmental Areas, limit development in *riparian areas*, retain *ecological networks*, and ensure construction best practices are followed.

Objectives:

- Ensure grasslands, *wildlife corridors*, sensitive ecosystems, and Environmental Areas are protected, preserved, and connected.

Case 2: Highway mitigation to improve connectivity of grassland species



Miistakis Institute

Alberta Conservation Association

Alberta

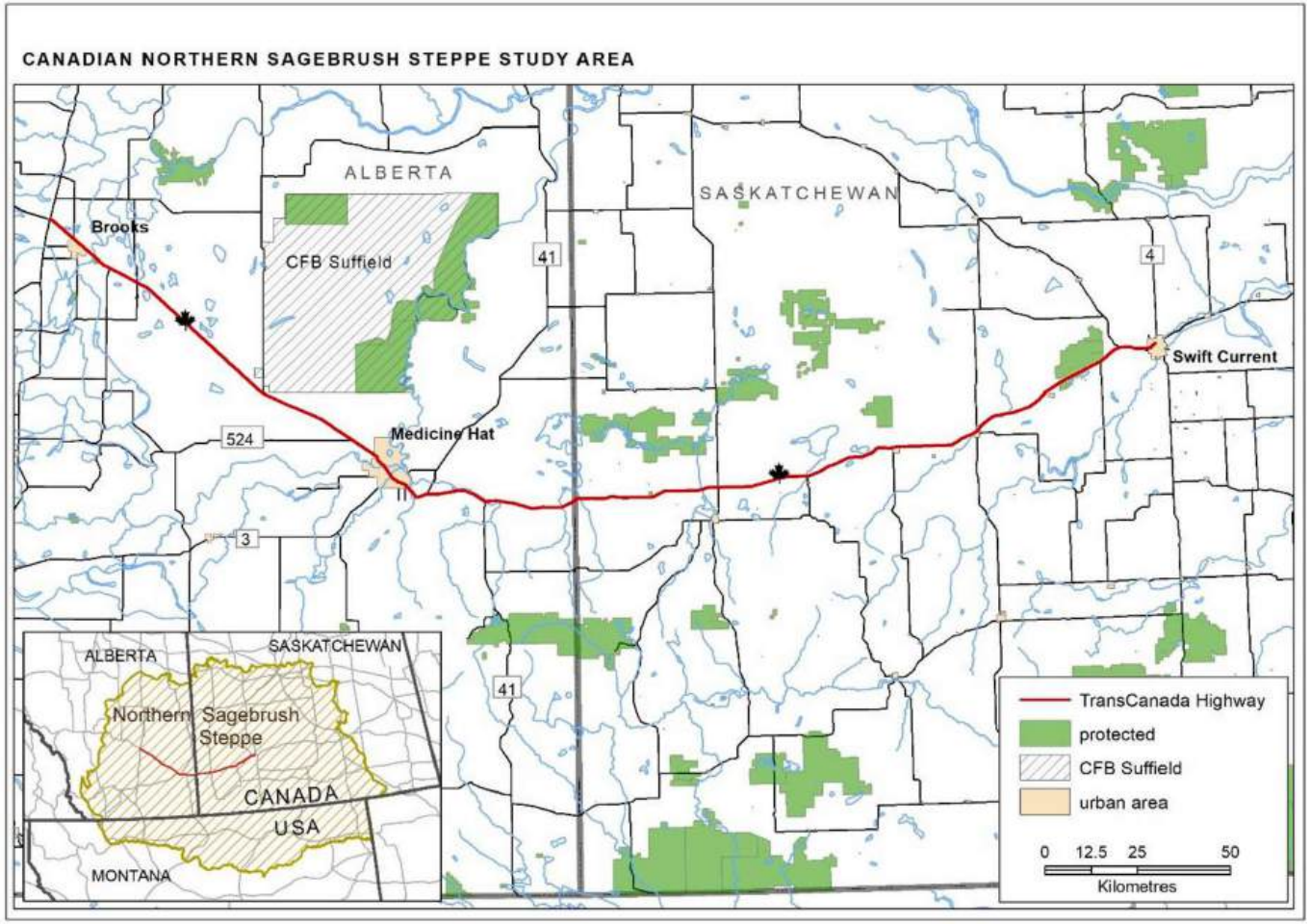
Saskatchewan

Canadian Wildlife Federation

Nature Conservancy Canada

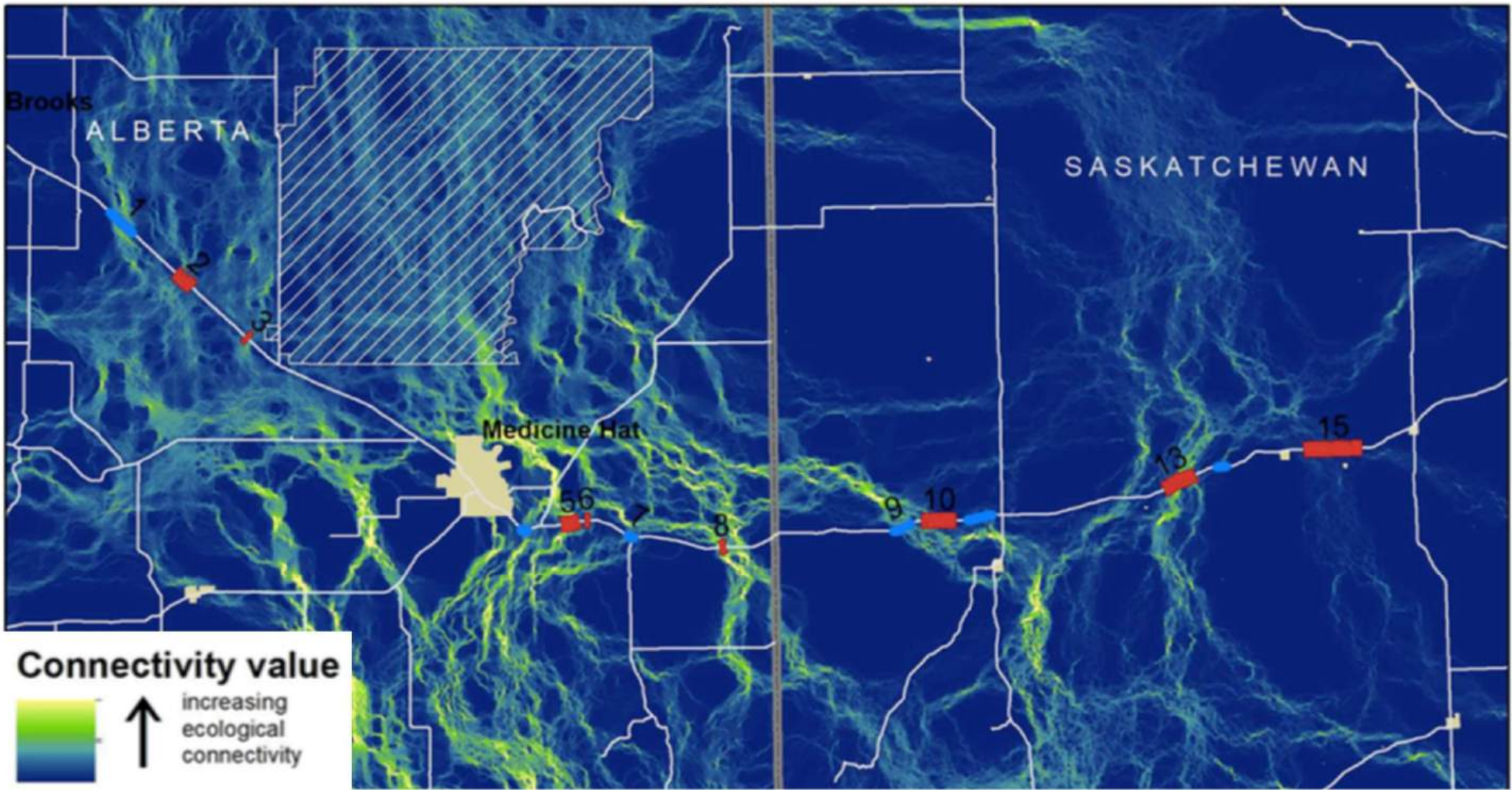
University of Toronto Mississauga

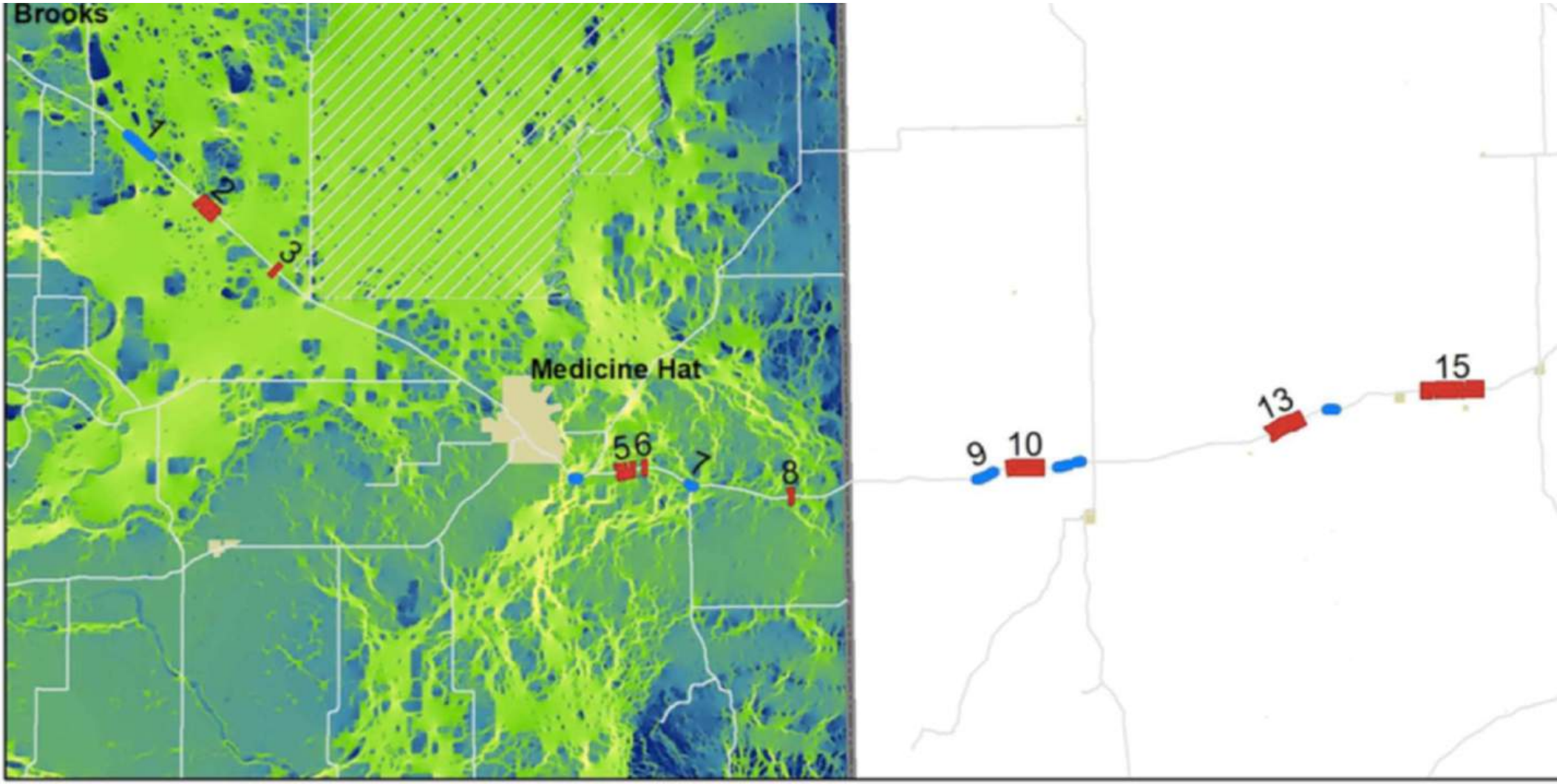
Objective: Identify and prioritise road mitigation sites on Hwy 1 that accommodate pronghorns and multiple other species



PRONGHORN CONNECTIVITY MODEL

Based on telemetry data from Andrew Jakes et al.



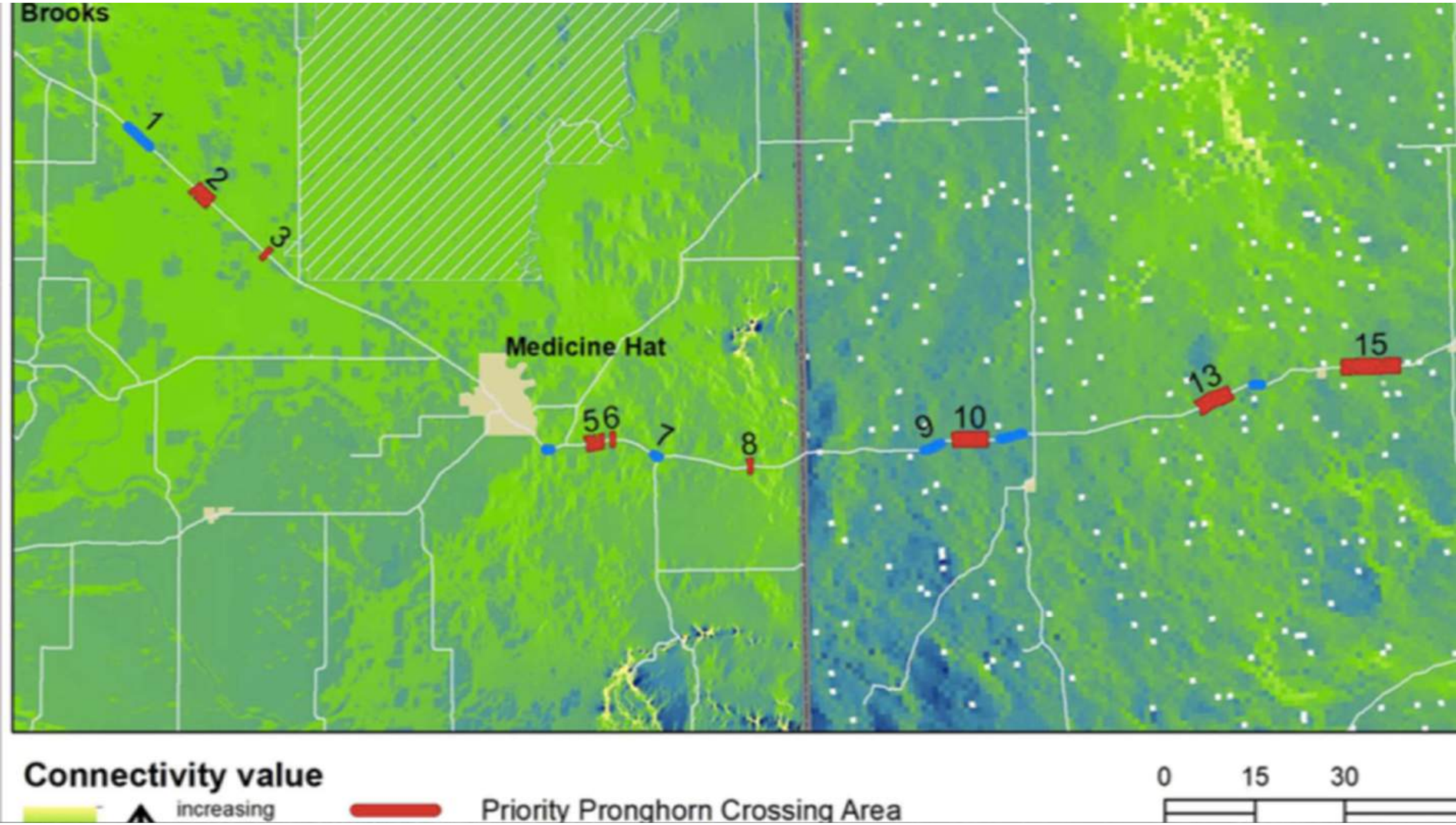


Connectivity value

increasing

Priority Pronghorn Crossing Area

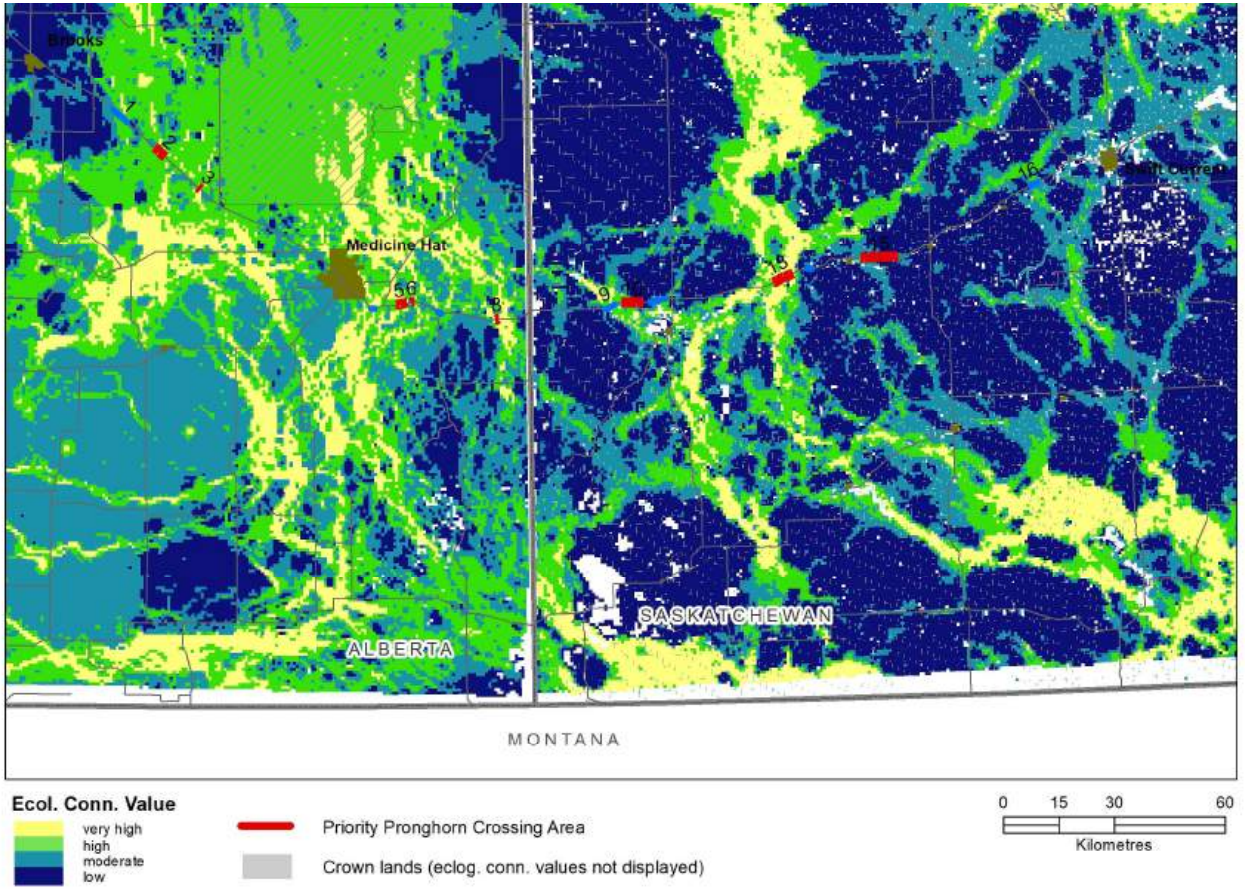
0 15 30


Brooks
Medicine Hat
1
2
3
5
6
7
8
9
10
13
15
Connectivity value
increasing
Priority Pronghorn Crossing Area
0
15
30

Modeling ecological connectivity

Overlay of connectivity models in Alberta:

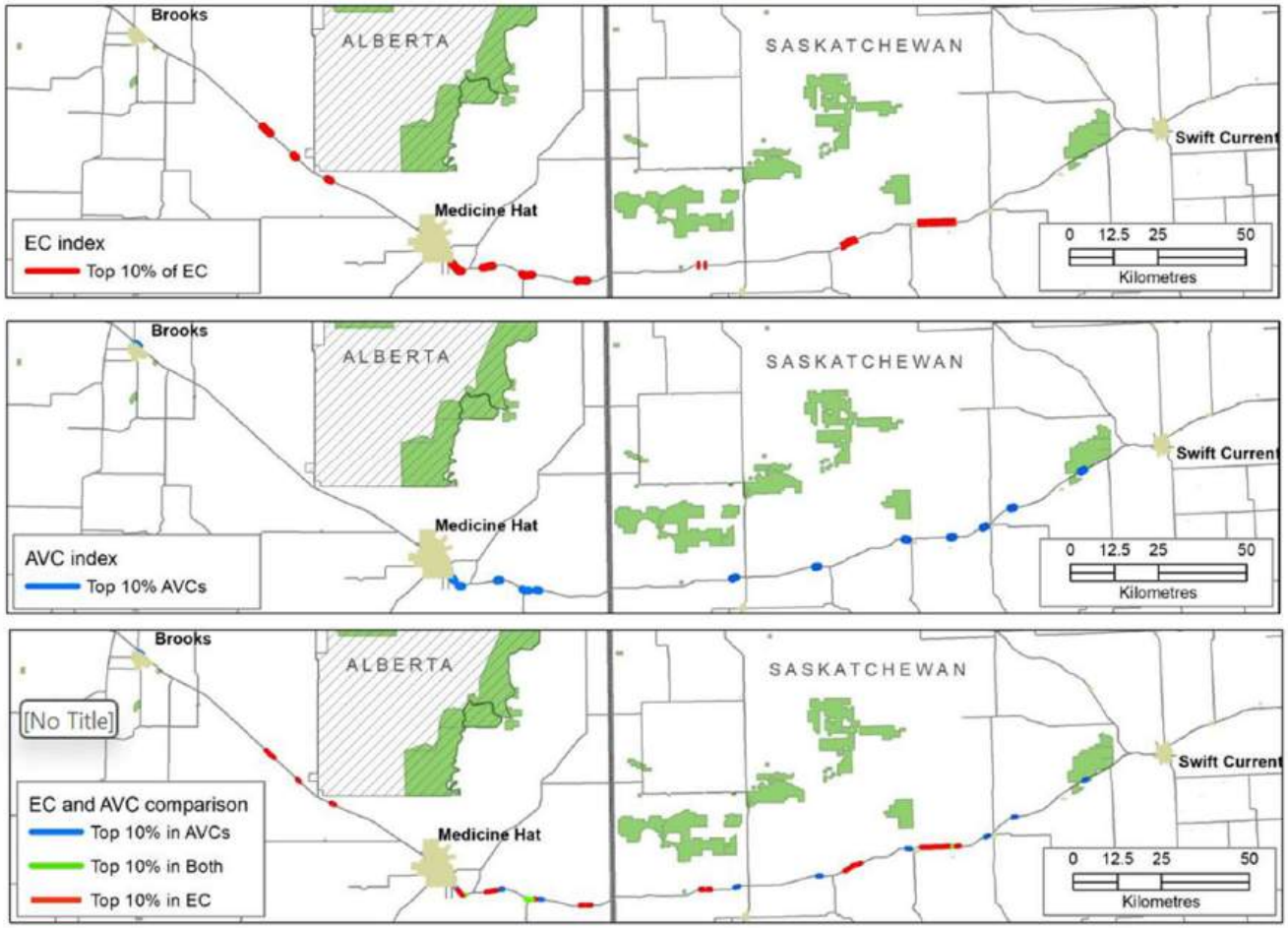
Overlay of connectivity models in Saskatchewan:



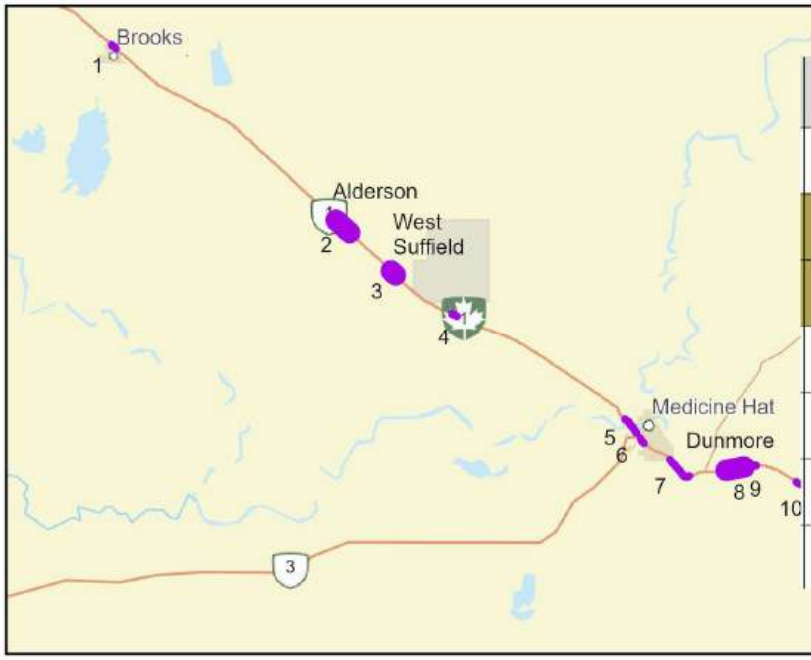
Road mitigation system

Alignment between grassland species movement needs and motorist safety risk.

- Where high valued ecological connectivity overlay intersects the TCH
- Where AVC clusters occurring along the TCH



Road Mitigation system



Site_No*	Site_Name*	Province	Num. of km	Ecological Connectivity	Motorist Safety Risk
1		Alberta	1	⊗	
2	Alderson	Alberta	3		⊗
3	West Suffield	Alberta	1		⊗
4		Alberta	1		⊗
5		Alberta	3	⊗	
6		Alberta	1	⊗	
7		Alberta	5		


STOP

CROSSINGS FOR CONSERVATION:

A Critical Investment

PronghornXing

GRASSLAND WILDLIFE cross roads frequently causing safety risks for motorists and wildlife.

Up to 34,500 vehicles travel on this stretch of the Trans Canada Highway each day.

THAT'S 1 CAR EVERY 19 SECONDS!

A road mitigation system will keep wildlife and motorists safe on this stretch of highway. A system could include overpasses, underpasses and wildlife exclusion fencing.

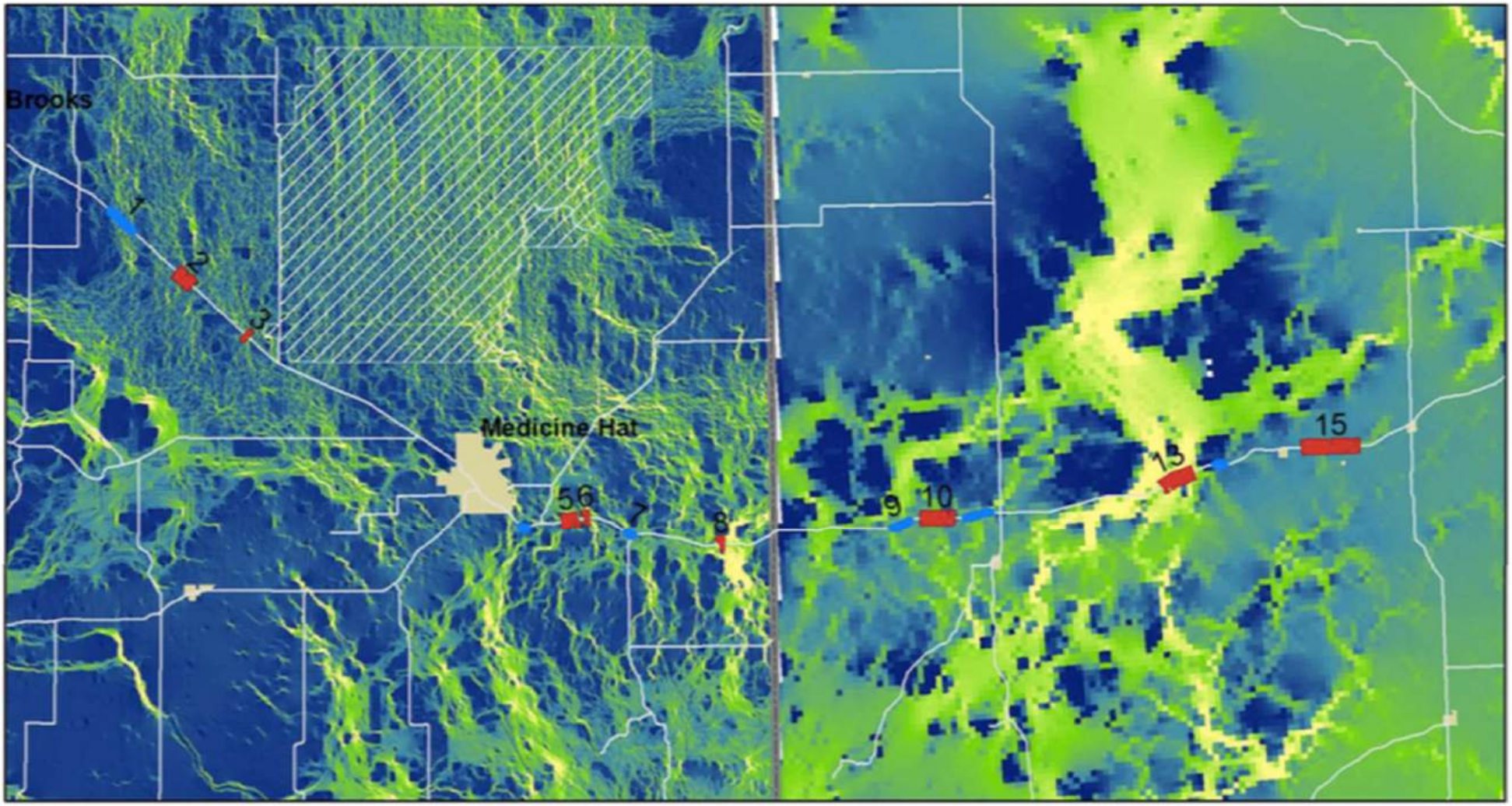
As traffic increases, so does the risk to wildlife trying to survive in grasslands—**one of the most threatened habitats on Earth.**

A wildlife overpass in this area is estimated to cost **$25 million dollars.**

Be part of the solution—invest in Canada's grassland future!


2024-11-26 3:51:30 PM M 3/3 -7°C
Thank you !
13N-H-RC
RECONYX

STRUCTUAL CONNECTIVITY MODEL



Based on human footprint data