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Informing Land & Resource Management

The effects of oil and gas activity on ungulate reproduction

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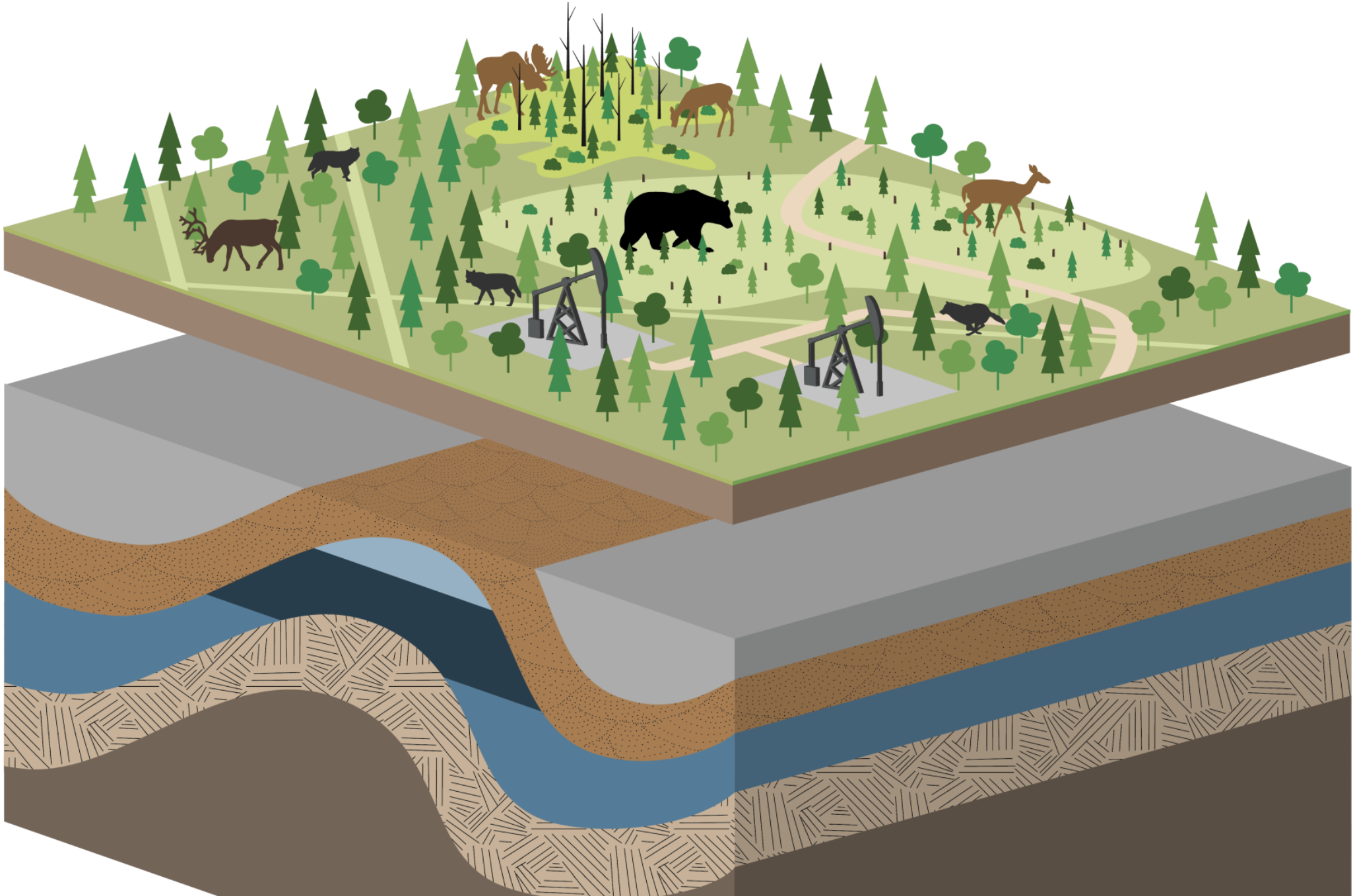
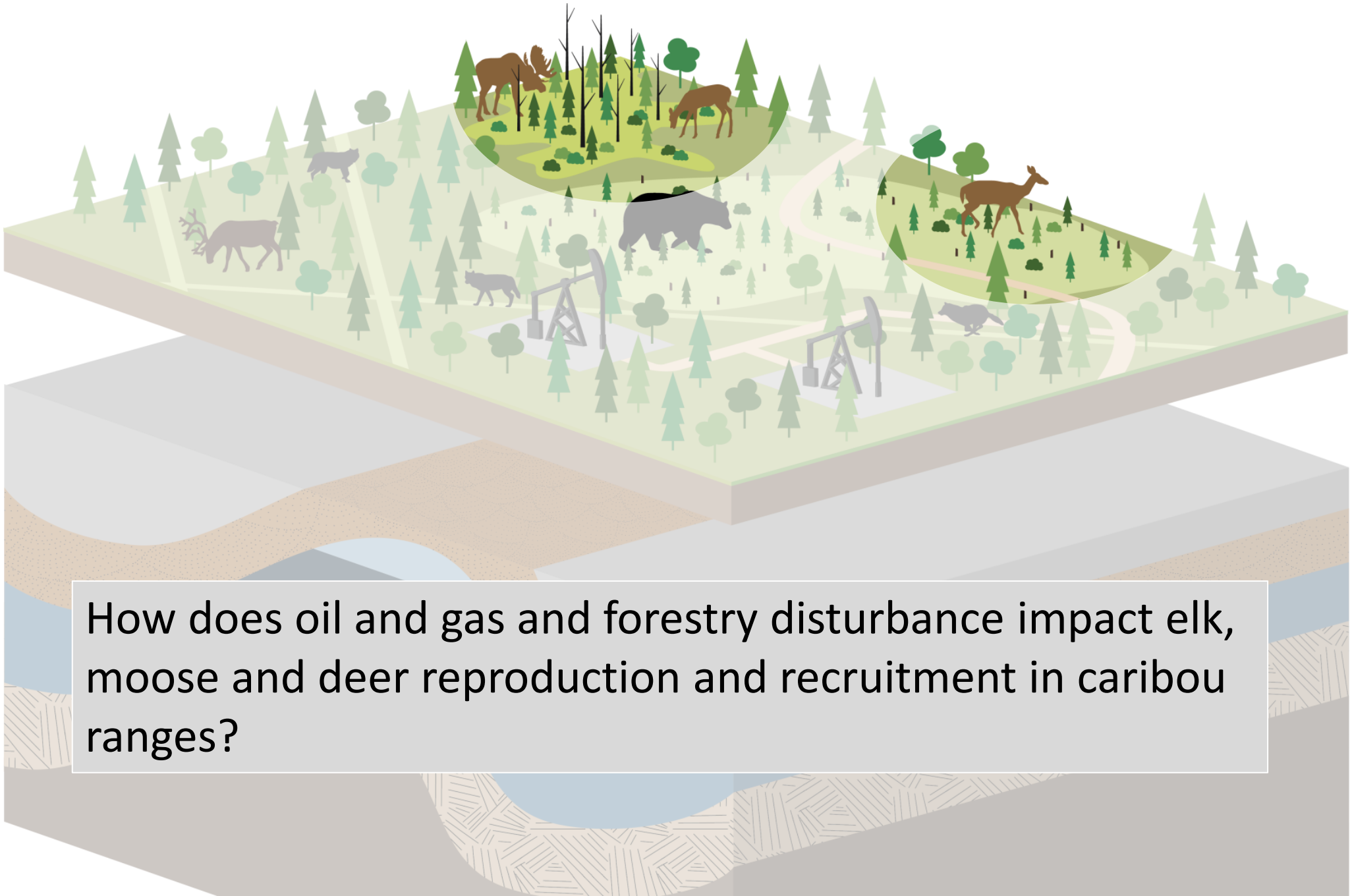




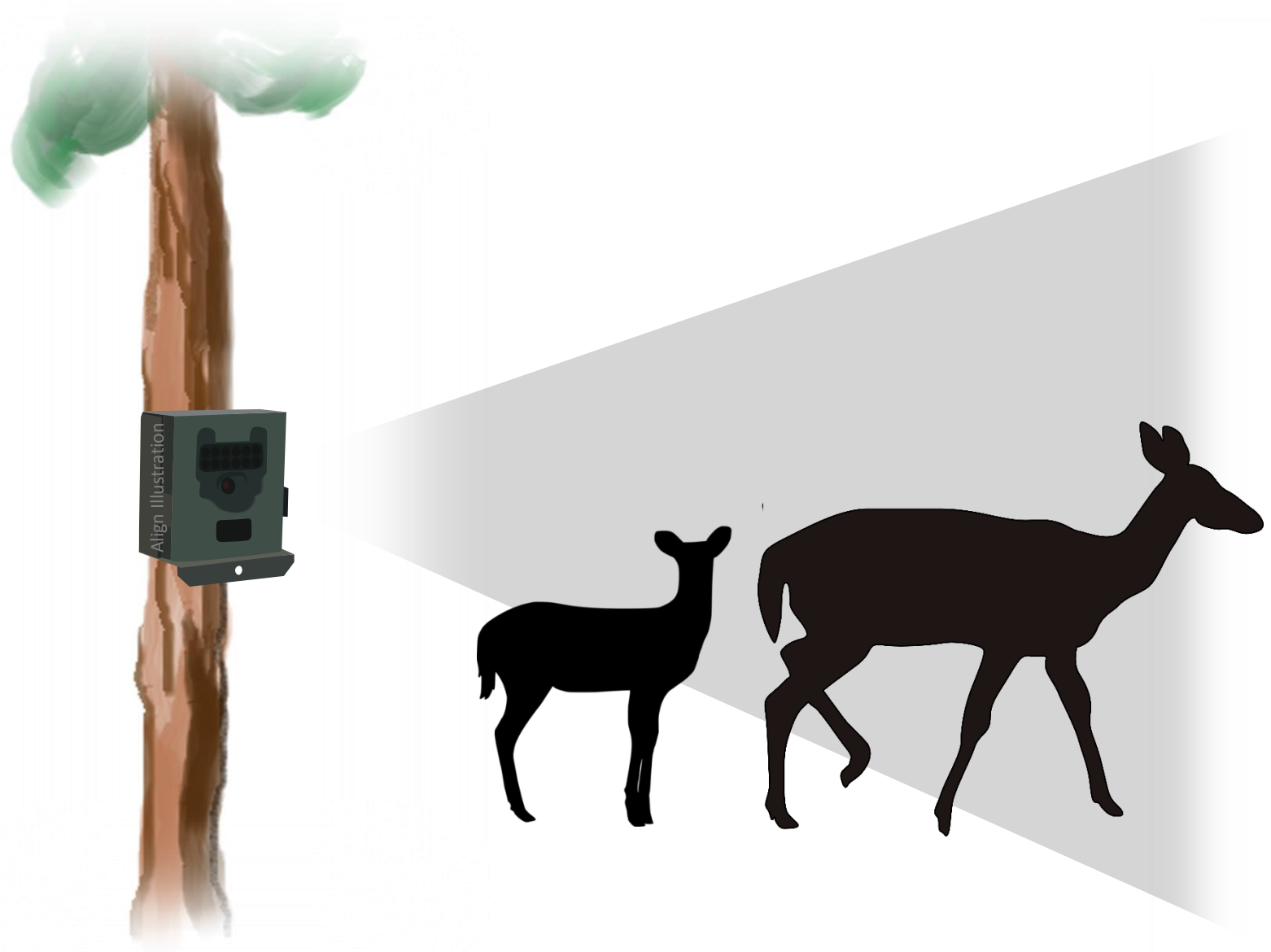
How does oil and gas and forestry disturbance impact elk, moose and deer reproduction and recruitment in caribou ranges?

Objectives

1. Model moose, deer, and elk **reproductive status** at seismic lines, wellsites, pipelines, and cutblocks in relation to surrounding anthropogenic disturbance densities, surrounding habitat characteristics, and climate factors.

2. Model indices of moose, deer, and elk **reproductive rates** in relation to surrounding anthropogenic disturbance densities, surrounding habitat characteristics, and climate factors.

Methods



New cameras deployed on pipelines 2023

Existing camera data collected from cutblocks, wellsites, and seismic lines

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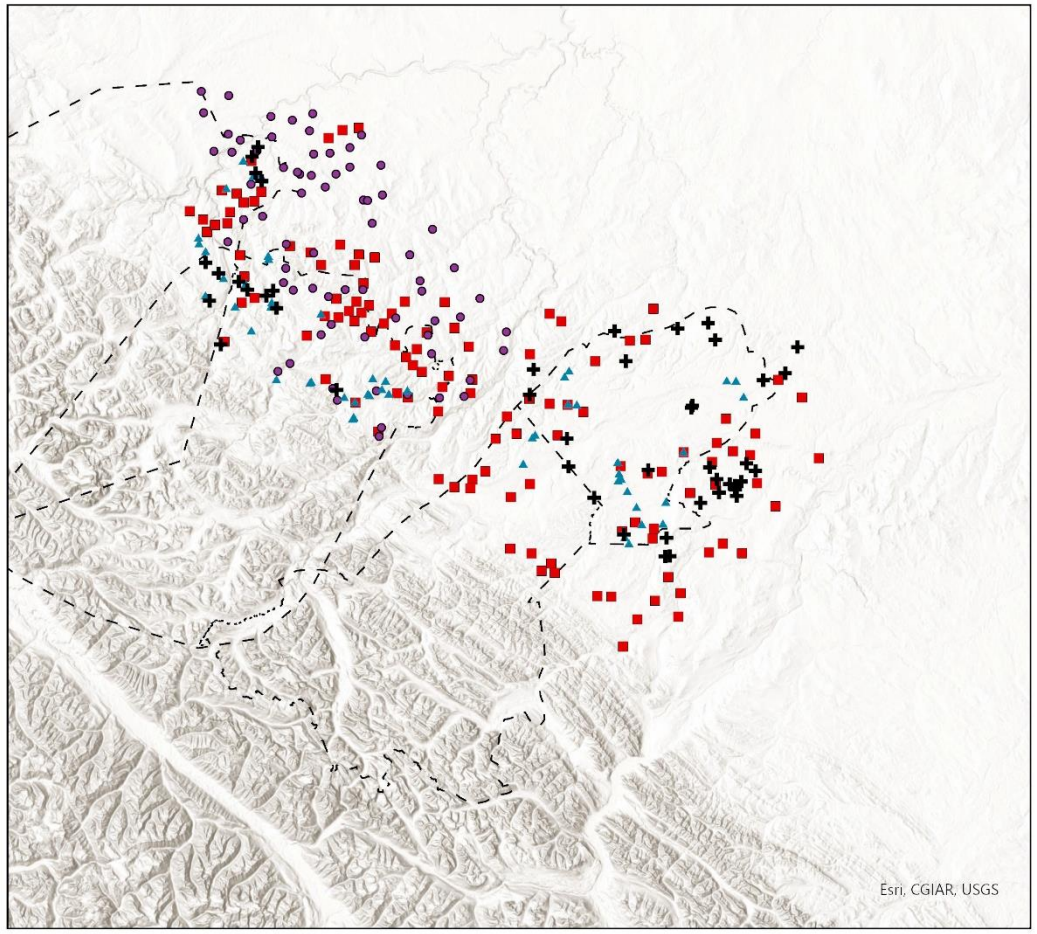

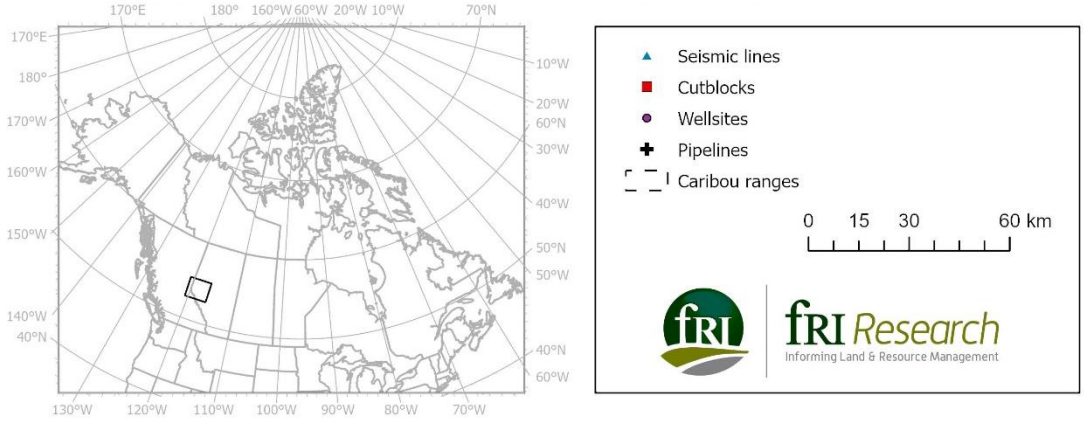

Methods

- Seismic lines: 2014-16, 150 lines, 39,077 camera days
- Cutblocks: 2018-20, 117 sites|35,445 camera days
- Wellsites: 2021-23, 69 sites (44 wells, 25 forest) |27,235 camera days
- Pipelines: 2023-24, 46 lines, stratified by ecosite Deployed November 2023

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Preliminary results – wellsites and cutblocks

			Adult		Subadult		YOY	
	Total images	Total detections	Sites	Detections	Sites	Detections	Sites	Detections
Cutblock								
Elk	7,934	217	45	199	0	0	7	18
Moose	33,442	711	98	652	12	18	25	40
White tailed Deer	18,148	1,213	106	1,117	8	8	32	86
Mule Deer	3,806	188	56	169	3	3	10	16
Wellsite								
Elk	10,491	348	29	273	11	34	6	41
Moose	13,542	598	44	479	26	83	16	36
White tailed Deer	27,391	2,464	47	1,896	35	321	29	247
Mule Deer	1,759	144	27	119	6	13	4	13
Caribou	3	1	1	1	0	0	0	0

Preliminary results – wellsites

YOY
- Higher densities of deciduous
- Closer to linear disturbances

Subadult
- Closer to cutblocks
- Farther from roads

Adult
- Closer to seismic lines
- Higher densities of conifer

Preliminary results – cutblocks

YOY
- Lower densities of cutblocks
- Farther from pipelines

Subadult
- Higher densities of of deciduous

Adult
- Lower elevation
- Closer to roads

Preliminary results – wellsites

YOY
- Higher densities of cutblocks

Subadult
- Closer to pipelines
- Higher densities of cutblocks

Adult
- Higher densities of cutblocks
- Higher densities of deciduous

Preliminary results – cutblocks

YOY

- Higher densities of seismic lines

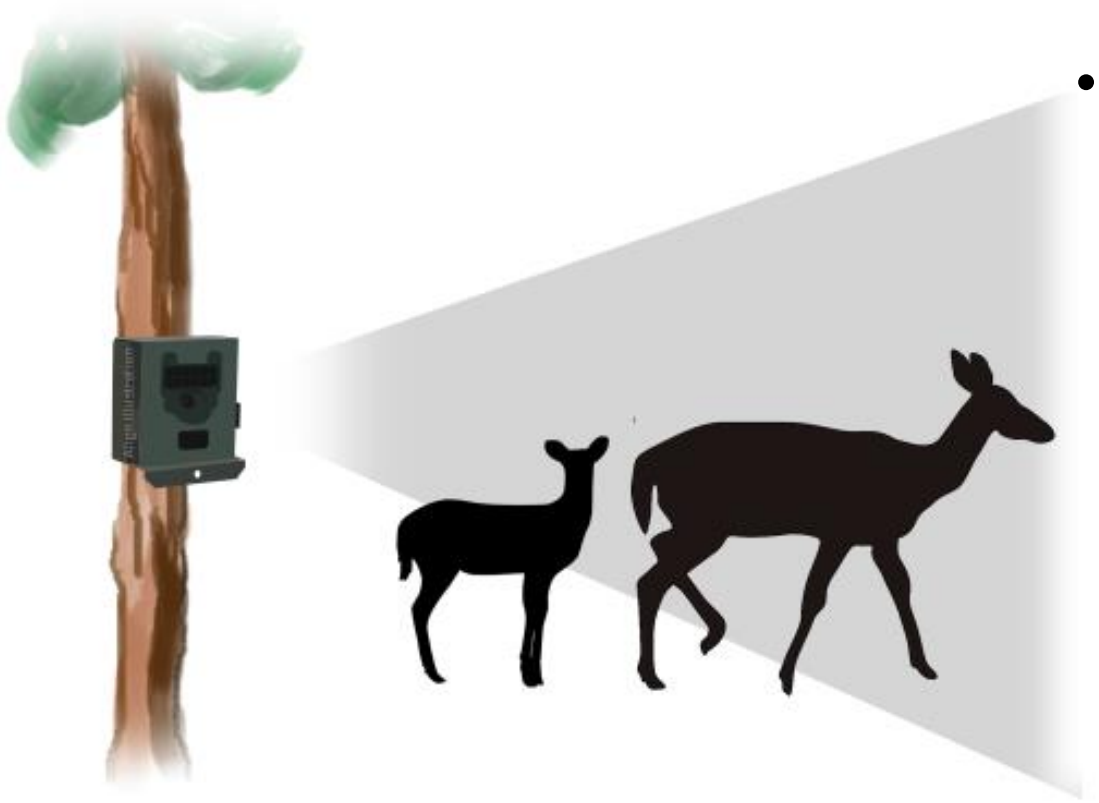
Subadult

- Higher densities of linear features
- Higher densities of cutblocks

Adult

- Lower densities of cutblocks
- Farther from seismic lines

Preliminary results

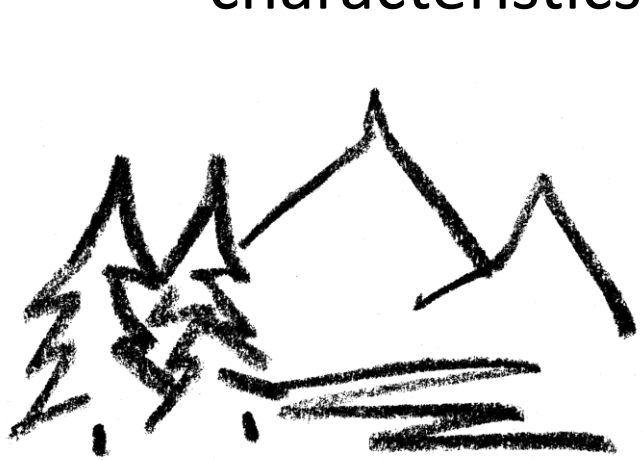


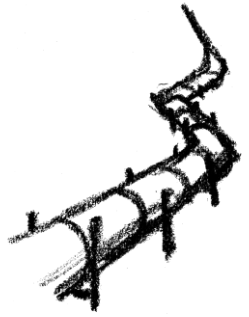
- Surrounding habitat influenced moose and deer use of cutblocks and wellsites

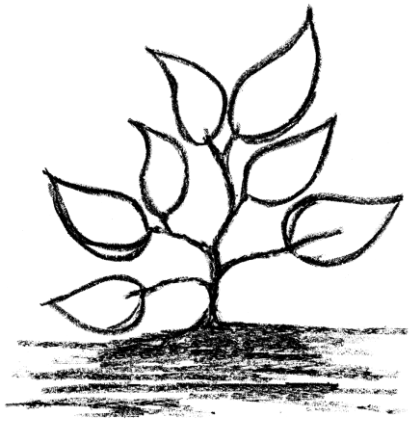
- Surrounding density of disturbance also influenced use:
  - Density of cutblocks influenced use by both species, but the relative influence differed between species and with age and reproductive status
  - Density of linear features also influenced use, but response varied.

Ongoing…

- Elk and mule deer use of wellsites and cutblocks
- Ungulate use of seismic lines
- Include additional variables in models related to climate factors, site characteristics (vegetation, hiding cover)







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Next steps

• Classify 6 months of pipeline data	July-November 2024
• Seismic line data analysis	July-November 2024
• Retrieve pipeline cameras	Nov-December 2024
• Presentation at AUPRF meeting	Nov 2024
• Classify remaining pipeline data	Dec 2024 – March 2025
• Presentation at conference	March 2025
• Analysis for final report, papers	March – June 2025

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Implications

- Information on links between ungulate population demographics, resource extraction, and habitat restoration, in caribou ranges in Alberta.

- Range and population dynamics of important game species in Alberta.

Combined, the knowledge from this project will provide important information on the impact of oil and gas activities on ungulate populations in Alberta.

Questions?

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