

Title: Towards stable caribou populations in Alberta: Considering resource selection by wolves, grizzly bears, and caribou to prioritize restoration of legacy seismic lines.

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1 Throughout their range, the decline of woodland caribou populations is thought to be a result of habitat
2 degradation and fragmentation from industrial activities. Land managers are under pressure to restore
3 habitat within caribou ranges and mitigate potential negative effects of resource extraction on caribou
4 into the future. Considering the historical anthropogenic footprint in Alberta, restoration efforts need to
5 be prioritized. Using a combination of LiDAR and animal GPS data, we investigated the influence of
6 vegetation height on the selection of seismic lines, and the zone of influence of these features on grizzly
7 bears, wolves, and caribou within four caribou ranges in west-central Alberta. Our objective was to
8 integrate the influence of vegetation height on seismic lines, seismic line density, and the zone of
9 influence of these seismic lines on caribou and their predators to identify areas with the highest
10 probability of overlap among grizzly bears, wolves, and caribou to prioritize restoration of legacy seismic
11 lines in Alberta and increase functional habitat for caribou. Based on LiDAR, the average vegetation
12 height of 12,854 km (83%) of seismic lines was less than 1.5 m while 2,392 km (15%) of seismic lines had
13 a vegetation height between 1.5 m and 5 m, and 341 km (2%) of seismic lines had an average vegetation
14 height greater than 5 m. Animal responses to seismic lines varied seasonally and were dependent on
15 regeneration stage. This research highlights predator-prey interactions on a managed landscape and
16 how our knowledge of these mechanisms is essential to effectively prioritize restoration.