19-ERPC- 05 Best Practices Recommendations

Project problem

Woodland caribou are declining across their ranges. Anthropogenic disturbance has converted mature forests into early seral stands with abundant forage preferred by moose, deer, and elk [primary prey]. As a result, caribou ranges sustain more primary prey which in turn leads to more predators, and increased predation risk for caribou. Restoring disturbed habitat and mitigating future impacts of disturbance are priorities for caribou conservation. Moose are the primary prey of wolves in Alberta and caribou are at greater risk where they co-occur with moose. By identifying habitat characteristics and specific landscape attributes preferred by moose restoration activities could be better focused to reduce moose (and wolves) within caribou ranges, and reduce the spatial overlap between caribou and moose. In addition, by understanding how moose respond to attributes of disturbances (harvesting strategies, regeneration, soil wetness, etc.), managers could prioritize remediation activities to reduce moose of disturbances across caribou ranges.

Project objectives

We used GPS data from moose collared in west-central Alberta between 2008 and 2010 to assess moose response to i) habitat disturbance and habitat characteristics at a broad-scale, and ii) attributes of habitat disturbances at a fine-scale. Our project was focused within the ranges of four caribou herds in west-central Alberta: A La Peche, Little Smoky, Redrock-Prairie Creek, and Narraway.

Our specific research objectives were to:

1. Assess moose broad-scale response to habitat, topography, and disturbance ('landscape-scale').
2. Assess fine-scale response to characteristics of disturbances.
3. Apply results from objectives 1 and 2 to create spatially explicit probability maps of moose habitat use of regenerating anthropogenic features in west-central Alberta.

Project results

- Moose generally selected areas associated with forage, i.e., wet, open areas, deciduous forest, areas with more early seral forest, and disturbances.
- Moose selected areas with more cover (higher canopy cover) during summer, particularly when they were in areas with less forest – likely because forest with denser canopies provide shade for moose during summer.
- Moose selected seismic lines during winter and summer, and were more likely to select seismic lines when they were in areas with lower densities of seismic lines.
- At the fine-scale, moose selected wetter seismic lines with higher vegetation, and drier seismic lines with lower vegetation

- Moose generally avoided pipelines and roads at landscape-scales, but at fine-scales selected pipelines not in forest, roads in disturbances (harvest blocks, wellsites) during winter, and roads in forest during summer.
- Moose selected areas closer to wellsites, and during summer were more likely to select areas closer to wellsites in areas with lower densities of wellsites and were more likely to select active wellsites.
- Moose selected harvest blocks, particularly harvest blocks in areas with lower densities of harvest blocks during summer.
- At the fine-scale, moose selected harvest blocks with higher vegetation during winter and lower vegetation during summer. Moose selected harvest blocks with more deciduous trees and shrubs and lower densities of planted conifer. During summer, moose in the foothills also avoided harvest blocks that had been treated with herbicide.
- We created maps showing predicted moose use of the lower foothills, upper foothills, and subalpine during summer and winter.

Actionable outcomes

- Evidence that moose are more likely to select seismic lines with they are in areas with lower densities of seismic lines highlight the important of considering landscape-scale seismic line densities when planning restoration activities. If all but a few seismic lines are restored within an area, predation risk for caribou may increase near the remaining unrestored seismic lines.
- Fine-scale analysis of moose response to seismic lines revealed that seismic lines are preferred by moose regardless of vegetation height and seismic line wetness. This information suggests that restoration activities need to target not only vegetation height on seismic lines (‘functional restoration’), but also vegetation composition (‘structural restoration’).
- Fine-scale analysis of moose response to harvest blocks revealed that moose response to harvest blocks varies with planting densities, understory species, vegetation height, and other silviculture practices. These results, in combination with ongoing work using cameras to monitor harvested areas, could be used by land managers when planning future harvest within caribou ranges.
- Results for wellsites and pipelines were less clear, but did demonstrate that respond to attributes of those disturbances (habitat matrix, activity) differently. Also, like seismic lines, as moose selected wellsites in areas with lower densities of wellsites, remediation activities targeting wellsites should consider overall wellsite densities across the landscape.
- Probability of occurrence surfaces for moose in the foothills and subalpine natural subregions can be used to target restoration activities in areas where moose use of caribou ranges is greatest.