Executive Summary

Woodland caribou are declining across their range and decades of research show that habitat disturbance linked to industrial activities is the ultimate cause of caribou decline. The conversion of mature forests into early seral stands with abundant forage has resulted in more moose, deer, and elk in caribou ranges. Moose are a preferred prey of wolves and predation risk for caribou increases where moose and caribou overlap. The goals of this project were to i) assess moose response to attributes of habitat disturbances, and ii) build resource selection models that could be useful to forest managers. Identifying broad-scale landscape attributes and fine-scale habitat characteristics that are preferred by moose could help focus restoration activities within caribou ranges to efficiently reduce moose numbers, and wolf predation risk for caribou.

In year one, we built landscape-scale models to assess and map broad-scale habitat selection. We also assessed moose response to attributes of harvest blocks and seismic lines. At landscape scales, moose selected areas associated with forage and cover for thermoregulation. At fine-scales, moose selected harvest blocks with deciduous trees and shrubs, low vegetation heights, and fewer conifer trees, and in the lower foothills moose avoided herbicide-treated harvest blocks during summer. At fine-scales moose selected seismic lines with low vegetation during summer and wet seismic lines during winter. In year two (this report) we investigated landscape-scale functional responses of moose to habitat disturbance. At fine-scales, we assessed response of moose to regeneration and soil wetness of harvest blocks and seismic lines, and response of moose to attributes of roads, pipelines, and wellsites.

At landscape-scales moose response to canopy cover depended on forest densities. During summer, moose selected higher canopy cover when they were in areas with lower forest densities, but were ambivalent to canopy cover when they were in areas with higher forest densities. During winter, foothills moose selected lower canopy cover irrespective of forest densities. We also found a functional response of moose to disturbances with moose selecting seismic lines, harvest blocks, and wellsites when they were in areas with lower densities of seismic lines, but only selecting roads when they were in areas with higher road densities. At fine-scales, during winter moose selected wetter higher vegetation seismic lines and drier lower vegetation seismic lines, but generally avoided seismic lines during summer. Moose also selected roads in disturbances (winter) and forest (summer), selected pipelines in forest, and selected active wellsites. For harvest blocks, moose selected higher vegetation during winter and lower vegetation during summer.

To our knowledge, this is the first study to investigate functional responses of moose to habitat disturbance and demonstrates the insights that may be gained from assessing response of generalist herbivores to proximity of disturbances and densities of disturbances. Notably, our results i) complement previous work on wolves demonstrating that restoration efforts need to consider not only the feature being restored, but also the overall densities of disturbance on the landscape, and ii) demonstrate that restoration efforts that achieve structural and functional restoration are most likely to reduce moose use of disturbed habitat. Overall, the results of this project may be used prioritize recovery actions in a cost-effective manner that maximizes their benefit to caribou.