Project Profile

Project Name:	Functional Restoration on Boreal Caribou Ranges
Project Number:	BCIP-2018-03
Proponent:	Alberta Biodiversity Monitoring Institute (Dr. Craig DeMars)
Funding Envelope:	Boreal Caribou
Timeframe:	August 1, 2017 to January 31, 2019

Project objectives

The objective of the project is to cost-effectively test the efficacy of recently developed techniques for functionally restoring linear features (e.g. seismic lines) within boreal caribou ranges. Assessing the efficacy of a particular technique in a controlled, smaller-scale experiment is a critical first step before deploying and testing techniques over a larger, more biologically meaningful areas. Key components of this primary objective are:

1. Cost-effectiveness
   "Cost-effectiveness" has two meanings, one explicit and one implicit. For the former, evaluating potential techniques should be done in a cost-effective manner due to the high costs associated with deploying such techniques in remote locations. Cost-effectiveness is also implicit in the types of treatments selected for testing. Perceived benefits of functional restoration over ecological restoration are that functional techniques should be faster to deploy, affect the targeted biological process in a shorter time frame, and be more cost-effective.

2. Evaluate the efficacy of a given technique
   In the context of caribou conservation, the proximate goal for restoring linear features is to limit their use by predators and reduce predator movement rates to levels similar to those expected if the forest were intact.

Project description

The project will use an experimental, treatment-control design to test the efficacy of newly developed forestry techniques for functionally restoring linear features within ranges of boreal caribou. In this context, functional restoration refers to techniques aimed at reducing predator use of linear features, which have been implicated in increasing predation rates of caribou and contributing to population decline.

Project background

Boreal caribou are provincially *Red-listed* in British Columbia and federally listed as *Threatened* due to population declines throughout much of their distribution. The main proximate cause of population decline is increasing predation, which ultimately has been linked to landscape disturbance within caribou range and climate change. Within western ranges of boreal caribou, linear features (LFs) such as seismic lines, pipelines and roads are a prominent form of disturbance and these features are thought to increase predation of caribou by increasing predator hunting efficiency and facilitating predator movement into caribou range. Because of these mechanistic links, limiting predator movement on LFs has become a management priority for stabilizing caribou populations in the long-term.

A number of approaches have been proposed for limiting predator use of LFs with most being some variant of habitat restoration. Restoring LFs within caribou range, however, has many challenges, including potential logistical constraints, high costs and extensive time requirements for implementation over biologically meaningful spatial scales. Because of these challenges, there has been increasing interest in developing functional restoration techniques that are cost-effective and faster to deploy. Functional restoration refers to techniques that aim to limit predator use of LFs to ultimately restore historic caribou-predator encounter rates but such techniques do not necessarily result in the restoration of lined areas to their pre-disturbance structural state (i.e. ecological restoration).

This project implements a new study design for develop and testing the efficacy of functional restoration techniques. This design employs a new methodology for increasing wolf encounter rates on selected LFs to limit sample size requirements and also recommends the testing of two recently developed techniques for restoring LFs; specifically, tree-bending and tree-hinging.

Project approach

The project involves:

1. The deployment of remote cameras on a sample of linear features to document their use by predators (i.e. wolves and black bears).

2. The deployment of tree-hinging and tree-bending forestry techniques on a subsample of linear features with the goal being to reduce predator use and movement.

3. A comparison of predator use of treated and untreated linear features to assess the efficacy of tree-hinging and tree-bending as functional restoration techniques.

Project deliverables

The deliverables from this project include the following:

1. A report summarizing the project findings.

2. Webinars and in-person presentations to all project stakeholders.