Habitat restoration within caribou ranges

Interim Progress Report September 2014

Prepared for the Science and Community Environmental Knowledge (SCEK) Fund

Prepared by

Laura Finnegan and Doug MacNearney

Project Overview and Objectives

Boreal and mountain caribou are protected under SARA with a target under the federal boreal recovery strategy to achieve a minimum of 65% undisturbed habitat within the range of each local population. The forestry sector is under pressure to implement habitat restoration of disturbed areas to achieve this 65% target. It is imperative to determine whether the extent of vegetation regeneration in previously disturbed areas influences caribou response to these features; when can this disturbed habitat be considered caribou functional habitat? Answering this question is fundamental to accurately define the extent of disturbed habitat within the range of each local population, and can be applied by land managers to prioritize areas for restoration that will be the most beneficial for caribou. In addition, as the ultimate goal of habitat restoration within caribou ranges is to maintain self-sustaining populations, monitoring of reproduction and population size, and how these respond to restoration practices, is essential to assess the efficacy of actions and continually inform management practices to improve caribou habitat.

Following this, this two year FRIAA and industry (forestry sector and oil and gas; see 'Budget and Timeline') funded project is using existing telemetry data and LiDAR based terrain metrics to address the following research objectives:

1. Determine whether caribou and predator response to roads and pipeline RoWs is influenced by the extent of re-vegetation and human use of these features.
2. Evaluate whether currently accepted 500m buffers on roads and pipeline RoWs apply when line characteristics incorporate information on regeneration.
3. Assess how human activity of linear features is affected by topography, geographic barriers and re-vegetation height.
4. Determine whether activity at worksites (active industrial activity) affects the movements of caribou.
5. Use non-invasive fecal DNA collections for caribou during the winter to determine the relationship between re-vegetation and current restoration activities on the distribution, size and health of caribou populations.
6. Assess whether the response of boreal caribou in the Chinchaga range (mixedwood upland peatland habitat) to re-vegetation stage of disturbed habitat differs from that of boreal and mountain caribou in conifer dominated landscapes.

7. Produce a list of landscape variables (e.g. re-vegetation height, human use thresholds) that can be used to quantify the extent of caribou functional habitat both in our study area, and elsewhere.
8. Create of a map of the study area evaluating priority areas for restoration that are the most beneficial for caribou, and the most cost effective for the forestry sector and industrial landscape users.

Study area

The study area encompasses the range of four caribou herds in West-central Alberta– Narraway, RedRock-Prairie Creek, A La Peche (all three Southern Mountain DU) and Little Smoky (Boreal DU), and one caribou herd in North-western Alberta – the Chinchaga herd (Boreal DU). The range of these caribou populations spans two forest ecozones (boreal and montane cordillera), three natural regions (boreal, foothills and rocky mountains) and eight natural sub-regions (dry mixedwood, central mixedwood, lower boreal highlands, upper boreal highlands, lower foothills, upper foothills, subalpine, alpine and montane). This area includes federally protected areas, provincially protected Wildlands and Wilderness Areas and lands managed by the provincial government for a number of uses including oil and natural gas extraction, and forestry. In year one of this project field research is focused within West-central Alberta, while in year two it will extend into North-western Alberta.

Project Activities and Current status

Following are details of the schedule of activities for this project, as well as their current status as of 31 Aug 2014.

Activity 1: ***Assess how inclusion of data on re-vegetation growth and human use affects the extent of disturbed habitat across the landscape from a caribou perspective, and whether the currently accepted 500m buffer on disturbed areas applies at all stages of re-vegetation.***

- Compile telemetry datasets for grizzly bears and caribou. **Complete**
- Create metrics of LiDAR re-vegetation height along roads and pipeline RoWs. **Underway**
- Randomly select and field visit sample of roads and pipeline RoWs, collect data on human use. **Underway (see details in next activity)**
- Analyze caribou and grizzly bear telemetry data in relation to re-vegetation stage of roads and pipeline RoWs and human use. **Will commence Dec 2014**

Activity 2: ***What determines human use of a linear feature?***

- Create a list of UTM points where linear features intersect with roads. **Complete**
- Visit a subset of these points and collect data on human use and topographical features at fixed intervals along the linear feature (summer) **Summer and Fall field data collection is complete.**

From June to September 2014 the field crew visited a random selection of points where pipelines and old roads intersect with roads currently in use (see Figure 1). At each field site they collected data at three distances from the road: 0, 100 and 500m and quantified the following at each distance: tree species composition and height, lateral and ground cover, sign of human and animal use (ursid, canine, ungulate), as well as the level of use (heavy to light). Across the three months of data collection they visited 46 pipelines and 55 roads. A preliminary analysis of the data shows that signs of use by humans, deer, and moose were most frequently detected on both old roads and pipelines, while old roads seem to experience heavier traffic overall (Fig 2). Human traffic on old roads was detected more frequently than on pipelines, and does not seem to be related to the distance to an access point on an actively used

road (Fig 3). Of the pipelines and roads visited, most had vegetation less than 2m tall, and vegetation regrowth of > 3m was rare (Fig 4 & Fig 5).

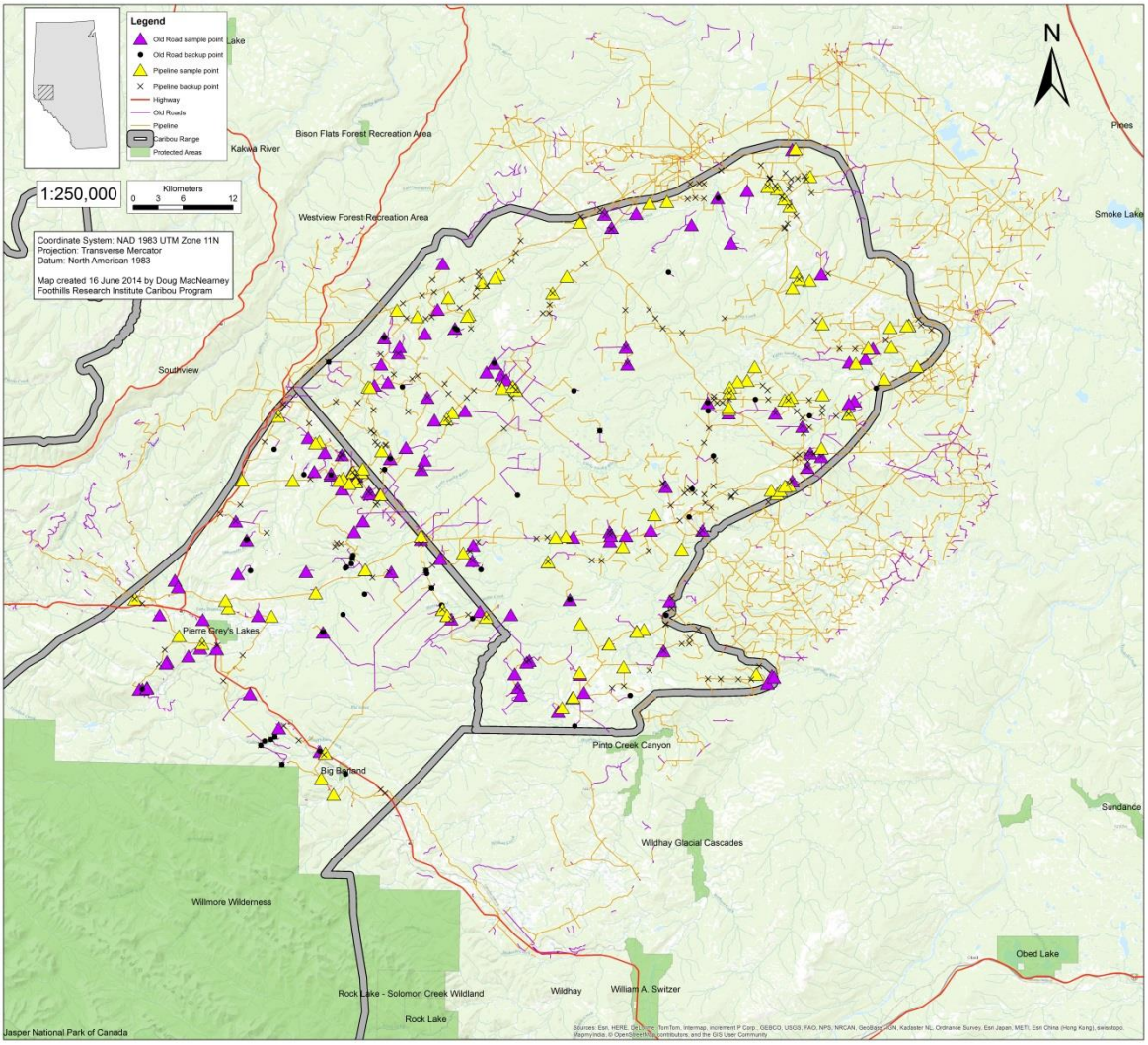

Fig 1: Map of FRIAA field sites for 2014 summer and fall season within the Little Smoky and A La Peche caribou ranges. From June to September 2014 crews visited pipelines (n = 46) and old roads (n = 55) to record evidence of human and animal use, as well as measure vegetation and terrain metrics.

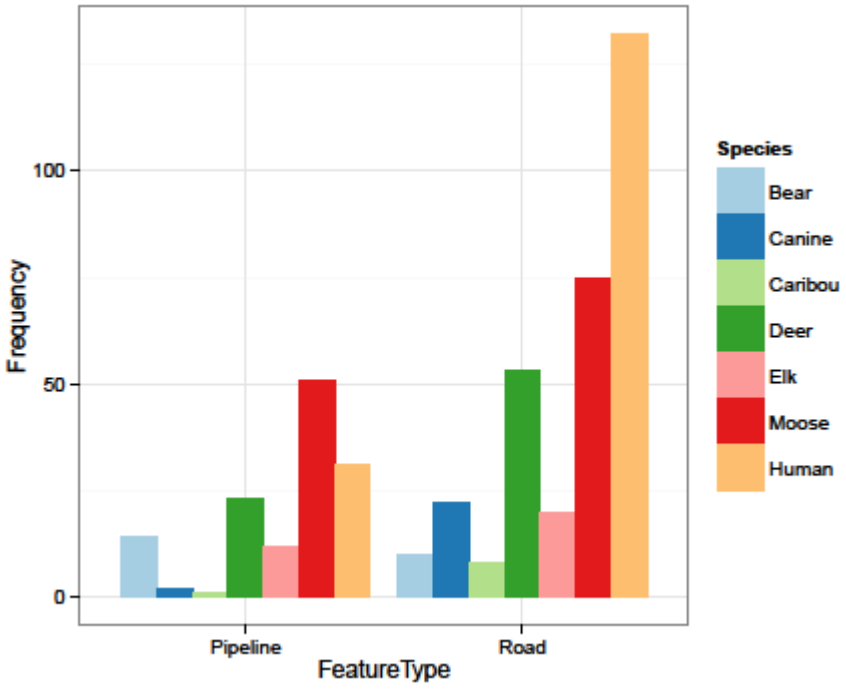

Fig 2. Frequency distribution of wildlife and human use of pipelines and old roads in the Little Smoky and A La Peche caribou ranges.

- Visit a subset of these lines in the winter (aerial surveys, snowmobile access) to determine the presence/absence of human use, and animal tracks. **To minimize disturbance of caribou ranges in the winter we will monitor a subset of pipelines and old roads visited during the summer and fall (Figure 1) remotely over the winter using counters and trail cameras. We will place cameras and counters in the field in November 2014 and they will be left in situ until March 2015.**
- Extract terrain metrics from linear features visited in the winter (e.g. slope). **Will start Nov 2014.**
- Analyze human use of linear features with respect to re-vegetation stage (summer) and topographical features (winter, summer). **Data entry is underway.**
- Field data collection in north-west Alberta. **Planning for this part of the project will start in Jan 2014.**

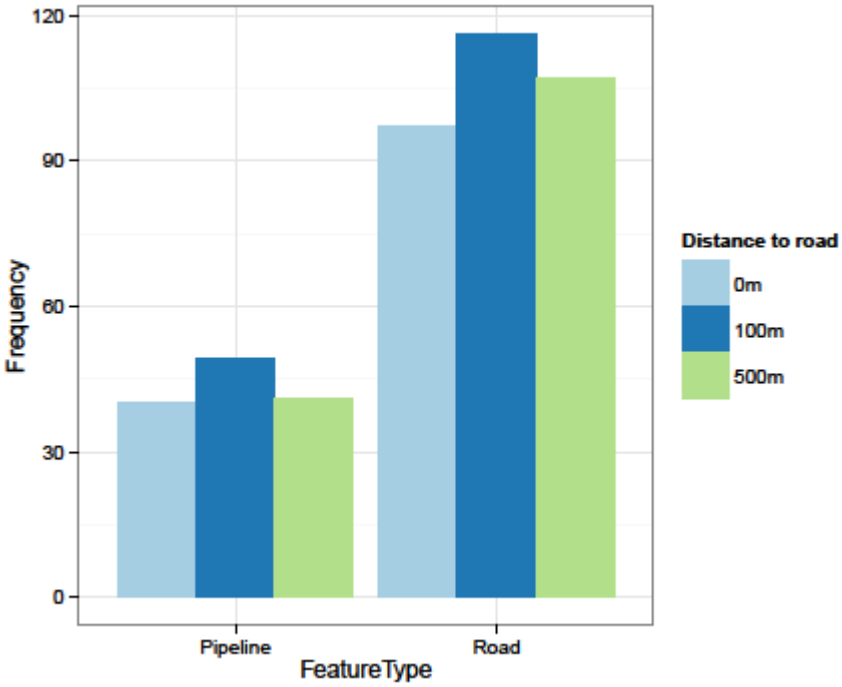

Fig 3. Frequency distribution of human use of pipelines and old roads in relation to distance to an access road.

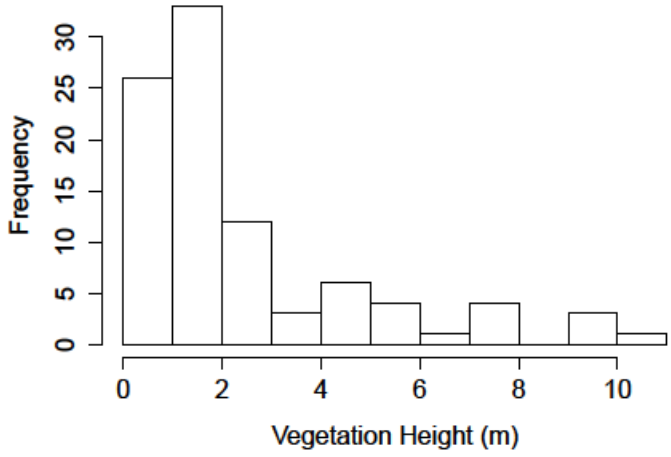

Fig 4. Frequency distribution of mean vegetation height (m) on pipelines in the Little Smoky and A La Peche caribou ranges.

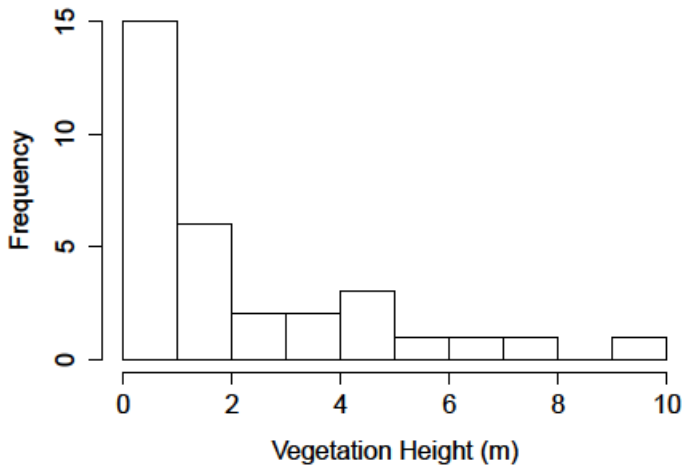

Fig 5. Frequency distribution of mean vegetation height (m) on old roads in the Little Smoky and A La Peche caribou ranges.

Activity 3: Does activity at work sites in an industrial landscape influence movement of caribou?

- Compile datasets on active worksites in West-central area. **Underway**
- Evaluate caribou habitat selection proximate to active work sites, inactive work sites, and control areas (no disturbance). **Will commence Jan 2014**
- Model the effects of worksite activity on caribou movement and occurrence during different seasons. **Will commence Jan 2014**

Activity 4: Determine how many caribou occur within West-central area and carry out population health assessments

Planning for this activity, to commence in Jan 2014, is underway

Activity 5: Does the response of boreal caribou to re-vegetation stage vary across different sub-regions?

- Compile telemetry datasets for caribou across North-west study area. **Telemetry data requested from AESRD**

- Create metrics of LiDAR re-vegetation height in disturbed areas. **LiDAR requested from AESRD**
- Analyze caribou GPS telemetry data in relation to re-vegetation stage and human use of disturbed areas. **Will commence January 2015**
- Statistically compare RSF models from West-central and North-west study areas. **Will commence 2015**

Activity 6: Guidance for the reclamation of disturbed areas to increase caribou functional habitat

This activity will start in 2015 once all field data and other analyses are complete

Scheduled partner engagement

November 2014 – conference call to update partners at end of field season and on progress to date

Feb – April 2014 – field planning for summer work in NW Alberta, discussions regarding in kind support for this fieldwork as well as data request for GIS layers (e.g. active roads, locations of H2S, gate codes) to assist with field planning and study site selection

April 2015 – partner meeting to discuss year one of the project, possibly seminar to present research findings

July 2015 – email update on project progress, conference call if preferred

November 2015 - conference call to update partners on final fieldwork and other progress to date

April 2016 – presentation of final results to project partners