Motivation

Previous studies (2010-2014):

• Line-blocking can reduce predator use on linear features

• Cameras can monitor intensity of use by animal communities
The outcome of a management action that mitigates a risk from ecosystem disturbances

“Disruption of wolf movements would support the implementation of functional restoration”

“The current body of scientific and management literature provides evidence that the technique should be effective”
Our Proposal to BC OGRIS (May 2015)

• Develop a mitigation strategy to facilitate the functional restoration of linear disturbances across a caribou range

• Implement a monitoring design to measure mitigation success using animal data
What is Success?

Before Mitigations

After Mitigations Applied

Predators / Day

Number of Months

Feature
Line
Trail
Line, Control
Line, Treatment

Application
Before
After
What’s Required?

- A Caribou Range
- Funding
- Cameras
- Approval to Conduct Restoration
Restoration Schedule

- Nov 2015: Deploy Cameras
- Dec 2015: Zone 1 Plan
- July 2016: Download Data
- Interim Data Capture
- Oct 2016: Present Interim Results
- Dec 2016 – March 2017: Parker Restoration Works Zone 1

April 2015: Parker Restoration Pilot Initiated
2016: Implementation and Logistical Planning
Study Design (also required)

• Random Draw of Potential Camera Monitoring Sites

• Separated by 1.5 km
Camera Deployment

85 Cameras Deployed

Nov. 2015
Ecological Data Collection

Paired Plots at Camera Monitoring Stations:

- Ecosystem
- Forest cover
- Understory plant cover
Ease of Travel: Timed Walk

- 70 m walk
  - Time
  - Step Count
  - Speed
  - Visibility Distance
  - Rating Class
- Matched & Paired
Interim Results

• Are data adequate to monitor multi-species effects?
• Can data/evidence inform restoration?
• Can data support effectiveness monitoring (BACI)?
Data Capture

Sampling Effort: 77 cameras, 7.5 months

<table>
<thead>
<tr>
<th>Species</th>
<th>Total Count</th>
</tr>
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<tbody>
<tr>
<td>Vehicles</td>
<td>579 (91% snowmobiles)</td>
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## Data Capture

**Sampling Effort:** 77 cameras, 7.5 months

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Recall Interim = Nov to July
Before Mitigation Data

Rates of use are higher on linear features than game trails.

Difference is greatest during winter months.
Before Mitigation Data

How can we reduce intensity of wolf use on linear features?

- 1 wolf / 80 days
- 1 wolf / 400 days
- 1 wolf / 100 days
How? (1) Reduce Snow Packing

Reduce winter vehicle snowmobile activity in caribou range.
How? (1) Reduce Snow Packing

- Restrict winter vehicle snowmobile activity in caribou range
  - 1 wolf / 14 days
  - 1 wolf / 400 days
How? (2) Reduce Ease of Travel

1 wolf / 33 days

1 wolf / 200 days
How? (3) Reduce caribou-predator overlap

Let’s consider lichen habitats
How? (3) Reduce Overlap

![Graph showing the mean rate of caribou use per day in relation to lichen cover. The graph indicates that 1 caribou is used every 6 days at low lichen cover and every 50 days at high lichen cover.]
Caribou, Lichen, and Snow Depth

1 caribou / 5 days

1 caribou / 50 days
How? (3) Reduce Overlap
How? (3) Reduce Overlap

- Packed: 1 wolf / 13 days
- Packed: 1 wolf / 29 days
- Unpacked: 1 wolf / 300 days
How? (4) Treat the right lines

Leave for natural restoration = check!

Low impact seismic?
Low Impact Lines?
What does the data say?

• Deal with human / access management first
• Prioritize and apply restoration based on travel-ability
• Prioritize lines to reduce caribou overlap
• Don’t assume “low impact”
Objective and Measure of Success

Figure 1  Predicted response of wolf use before mitigations (Phase 1) and after mitigations (Phase 2) on linear features (Line) and animal trails (Trail)

Is this Realistic?
## Schedule, Schedule, Schedule

<table>
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<tr>
<th>Before Mitigation Objective</th>
<th>Outcome</th>
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<tr>
<td>Provide evidence to inform restoration</td>
<td>Evidence provided but not incorporated</td>
</tr>
<tr>
<td>Provide data to support monitoring (BACI)</td>
<td>Yes, but the design and expectations are now different</td>
</tr>
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Zone 1 Restoration Plan

- 52 km restoration planned
- 100+ km of snowmobile line
- ?km’s of low impact lines
After Mitigation Predictions

• Area-based reduction to predator use will not result in Zone 1
• Area-based caribou-predator overlap will remain
• Predator use of treated lines will change according to new line conditions: snow and ease of travel measures
Thank you!

Questions?

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