Collaborative Caribou Habitat Restoration at the Landscape Scale

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SERWC RESTORATION FOR RESILIENCY
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A warmer climate generates larger and more frequent fires, resulting in more young forest.

Logging requires roads and removes older trees, creating young forest.

Gas exploration and development creates linear features and removes old forest.

1. Young regenerating forests provide abundant forage for moose, deer, and elk populations that are expanding northward with warmer temperatures.

2. Wolf populations increase with abundant moose, deer, and elk.

3. Linear features such as seismic lines, pipelines, and roads create travel corridors into caribou habitat.

4. Wolves encounter caribou more often, and caribou populations decline.
Habitat Restoration

DEFINED

• Functional Restoration: application of techniques on anthropogenic disturbances that deter predation, primary prey and human use in the near term, and support habitat recovery in the long-term

• Ecological Restoration: primary objective is to return a disturbance to a similar state of ecological function as before the disturbance (Wilson 2015)
Stabilizing 0-5 Years

Recovering 6-50 Years

Sustaining 50+ Years
Parker Boreal Caribou Range Pilot Project

PLANNING 2015-2016

- Boreal Caribou Implementation Plan (2011)
  - Resource Review Areas
  - $5M over 5 Years – Research
  - BC Oil and Gas Research and Innovation Society (BC OGRIS) through Research and Effectiveness Monitoring Board (REMB)

- Zonation Approach for Multi-year implementation
- Entire Boreal Caribou Range (2015)
- Wildlife Monitoring (BACI design)
- Focus on local community and resources to implement the physical work
Not All Linear Disturbances are Equal

**SEISMIC LINES ≠ CUTBLOCKS**

- Natural Recovery
- Compaction
- Predator, Human Use / Game Trails
- Width, Orientation (light, moisture)

- MOISTURE, MOISTURE, MOISTURE
- Soil Mineral Layer
- Type of Disturbance (mulch management)
- Microsites
- Historical Seeding Practices
Parker Range Restoration Pilot

LINEAR DISTURBANCE INVENTORY

• Linear Disturbance Inventory Mapping
• 360 Imagery to capture extent and regeneration status of linear disturbances
• 1,040 km linear disturbances captured
• Field trothed

• Data fields by linear segment:
  • site type (upland, mineral wetland, organic wetland)
  • dominant woody vegetation species
  • vegetation cover (%)
  • vegetation height class (0-50cm, 50-100cm, 100cm+)
  • presence of game trail
  • linear corridor width (m)
Decision Support Framework

TREATMENT OPTIONS

- Predator movements in relation to veg heights (e.g., Dickie 2015)
- Veg Heights
- Veg Cover
- Presence/Absence of game trail
- Minimize risk to natural veg and maximize use of $’s
Planning Parker Caribou Range

DISTURBANCE INVENTORY: PROGRAM PLAN

1,040 km linear footprint:
• 38% Leave for Natural
• 7% No Treatment
• 55% (569 km) Treatment Candidate
Landscape Scale

RESTORATION CANDIDACY
Landscape Scale

ZONES, PRIORITIES, ACCESS
Landscape Scale

SETTING PRIORITIES
Landscape Scale

SETTING PRIORITIES
Zone 1 Implementation

PILOT PROGRAM, COLLABORATION

- Program Plan Advisory Team
  - Oil and Gas Commission
  - Ministry of Forests, Lands and Natural Resource Operations
  - CAPP / Oil and Gas Industry
  - REMB Technical Advisor

- Facilitated opportunities to integrate Aboriginal Businesses as core function in Implementation with objective of capacity building

- Municipality (open house)
- Trappers, Canfor
- Recreational Users
- Local businesses
Zone 1 Implementation

JANUARY – MARCH 2017

• Local Aboriginally Owned Contractor
• Fort Nelson First Nations Monitors
• Field assistance through FNFN Environmental Technicians
• Site Specific Health, Safety and Environment Plan

• 8 Week Field Implementation Program
• Access - tracked vehicles only
• 61 km’s of historical disturbance treated
• An additional 105 km were verified for Leave for Natural
• 23,220 seedlings (primarily black spruce) were planted using winter seedling planting techniques
Zone 1 Implementation

JANUARY – MARCH 2017

- Mounding with winter Sb Seedling Planting
- Hybrid spruce limited use (uplands in high potential Archy areas)
- Tree felling in uplands

- Time to train operators and field assistants
- Plans are plans, tweaking needed
- Low impact seismic lines had same width attributes as traditional seismic lines and therefore were treated for access control
- Amendment process developed with FNFN and FLNR
Treatments

TREETFEELLING
Treatments

MOULDING AND PLANTING
Treatments

MOUNDING BERM AND TRENCH
Treatments

PLANTING FROZEN SEEDLINGS ON A BERM STYLE MOUNDING TREATMENT IN LOWLAND SITE
Treatments

TREEFELLING / MOUNDING / PLANTING
Treatments

USE OF COARSE WOODY DEBRIS / TREE FELLING
### BC Caribou Restoration Monitoring Framework

**1st Year Growing Season (2018)**

Table 2: Recommended Evaluation Criteria, Indicators and Targets for 1st and 5th Growing Seasons

<table>
<thead>
<tr>
<th>Restoration Objective</th>
<th>Restoration Unit</th>
<th>Evaluation Criteria</th>
<th>Indicator</th>
<th>1st Growing Season</th>
<th>5th Growing Season</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vegetation Establishment</td>
<td>Upland and Transitional</td>
<td>Density of live seedlings (stems/ha) of planted seedlings and naturally regenerating seedlings (i.e., from seed ingestion or suckering)</td>
<td>% of surviving planted or naturally re-established seedlings</td>
<td>At least 70% of seedlings/ha surviving (when seedlings planted in winter^1^, ^2^, ^3^, ^4^), at least 90% of seedlings/ha surviving (when seedlings planted in summer ^1^, ^5^). Identify any immediate issues such as seedling mortality due to poor seedling stock or desiccation; poor seed germination, and improperly placed or spread access control treatment implementation.</td>
<td>At least 50% of seedlings/ha surviving. Tree seedlings (planted and/or natural regeneration) demonstrate sustained growth trends (seedling height and leader growth) between 1st and 5th monitoring periods.</td>
</tr>
</tbody>
</table>

|                           |                          | Percent cover of targeted vegetation (conifer)                                      | > 80% of surviving seedlings in treatment plot are considered well spaced. ^6^ | > 80% of surviving seedlings in treatment plot are considered well spaced. ^6^ |
| Evidence of chlorosis     | No evidence of chlorosis  | Identify any immediate issues such as seedling color or freeze desiccation          | Identify any immediate issues with invasive species | Identify any immediate issues with invasive species |

| Density of targeted vegetation | Target of 1,200 stems/ha, with minimum 840 stems/ha from winter planting and 1,080 stems/ha for summer planting (based on 70% and 90% survival, respectively) ^3^, ^5^, ^6^ | Live seeding density of 1,600-2,000 stems/ha (combined planted seedlings and/or natural regeneration) on sites not mounded. |

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BC Caribou Restoration Monitoring Framework

LEGEND
- Biogeoecological Ecosystem Classification zone and site zone plot location in adjacent vegetation
- Plot center of monitoring plot, marked with PVC pipe and wooden stake
- Edge of linear disturbance
- Sample mounds (minimum 8 m subplot)
- Restoration Unit (upland, transitional, lowland-heath)
- Adjacent Boreal Site series vegetation

Treatment (25 m)
3 subplots

Control (25 m)
3 subplots
BC Caribou Restoration Monitoring Framework

**1st Growing Season, Paired Plot Design**

- Met Monitoring Framework Targets
- 2,467 Stems / ha > 1200 stems/ha
- > 70% seedling survival target
- Leader growth ave 11 cm (0-23 cm)
- Good health and vigor; ungulate browse, clay mixing with mineral soil, subsistence/freeze thaw, planting temps
- No invasives, no human use limited wildlife use
Parker Range Pilot Project

**SUMMARY**

- Landscape Level, Collaborative Habitat Restoration
  - 1\textsuperscript{st} in Canada to target an entire boreal caribou range
  - Parker Range Program Plan is complete, inventory, 360 photos
  - multi-year Program Plan to execute; with 4 Zones
    - Zone 1 Implementation completed winter 2017
    - Zone 2 Implementation Plan ready; seedlings not sourced
- Monitoring for both wildlife response and vegetation trajectory response built into the Range Restoration Plan
- Pilot Program provides opportunities for Habitat Offsets
- Consider Indigenous Community Partnerships. Not just commercial opportunities only. Consider concept of the Land
Key Learnings

• High desire for engagement and collaboration within larger landscapes
• Early Engagement
• Focus: Priority Areas, Zonation Approach
• Have moved from discussions to on the ground action
• We have the toolbox; monitoring and research is underway
• Informal knowledge sharing
• No existing framework, policy, or guidelines for consistent approaches, monitoring or objectives
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- Fort Nelson Snowmobile Club
Questions?

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