

8:30-8:45	Greetings, introductions, review of agenda	Ritchie
8:45-9:30	REMB program overview	Wilson
9:30-10:00	Revised BCIP	Watters
10:00-10:30	Break	
10:30-11:00	Moose resource selection and wolf distribution	Mumma
11:00-11:30	Caribou-wolf overlap	DeMars
11:30-12:00	When is restored habitat functional?	Finnegan
12:00-13:00	Lunch (provided)	
13:00-13:30	Update on Parker restoration planning	Bentham
13:30-14:00	Results of preliminary wildlife monitoring in the Parker	Keim
14:00-15:00	Update on health study and landscape correlates	Macbeth/Bondo
15:00-15:30	Break	
15:30-16:15	Panel/open discussion on major outcomes, learnings themes, next steps	Wilson, Ritchie, Mackay

PROGRAMME UPDATE

November 2016



OUTLINE

- Accomplishments (and challenges) to date
- Current state of projects and funding
- Perspectives on outstanding issues and future direction

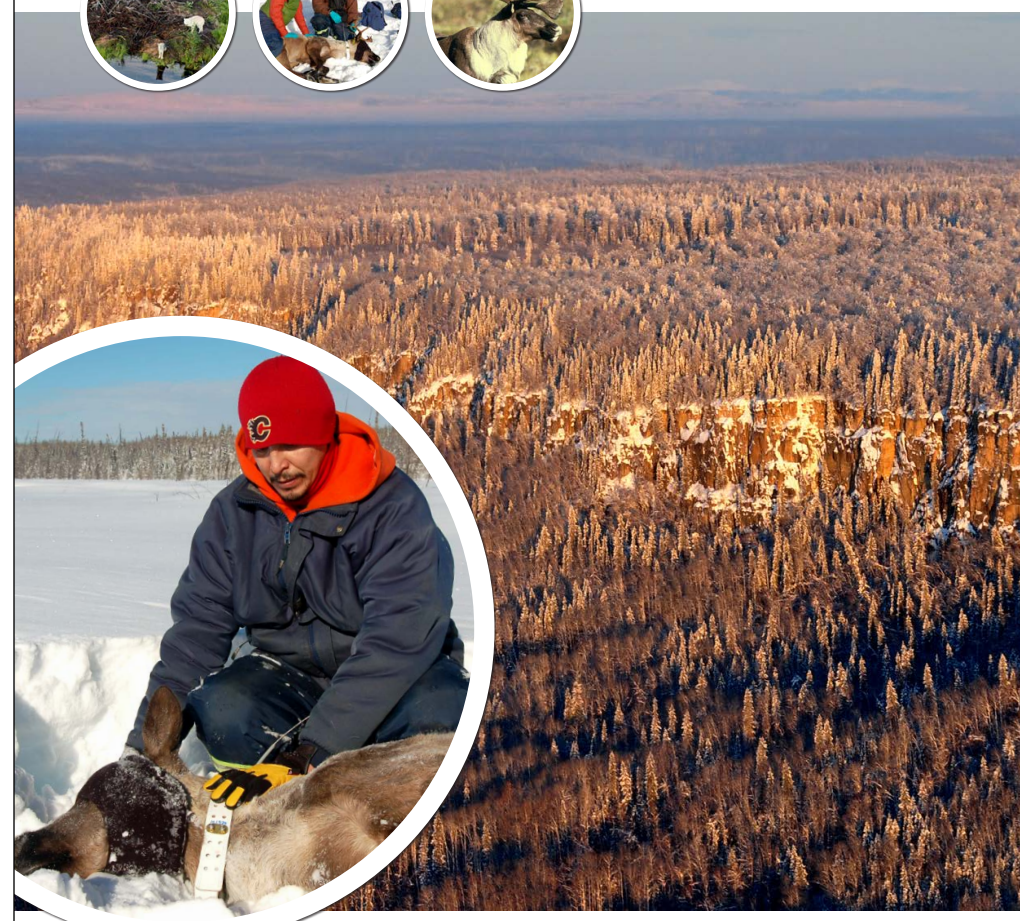
ACCOMPLISHMENTS



BC BOREAL CARIBOU RESEARCH AND
EFFECTIVENESS MONITORING BOARD

ANNUAL REPORT 2013

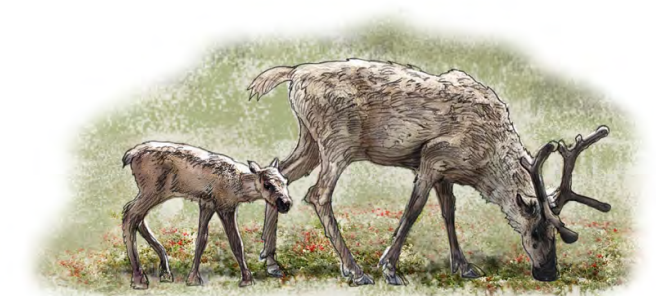
BC Boreal Caribou
Research and Effectiveness
Monitoring Board
ANNUAL REPORT 2014



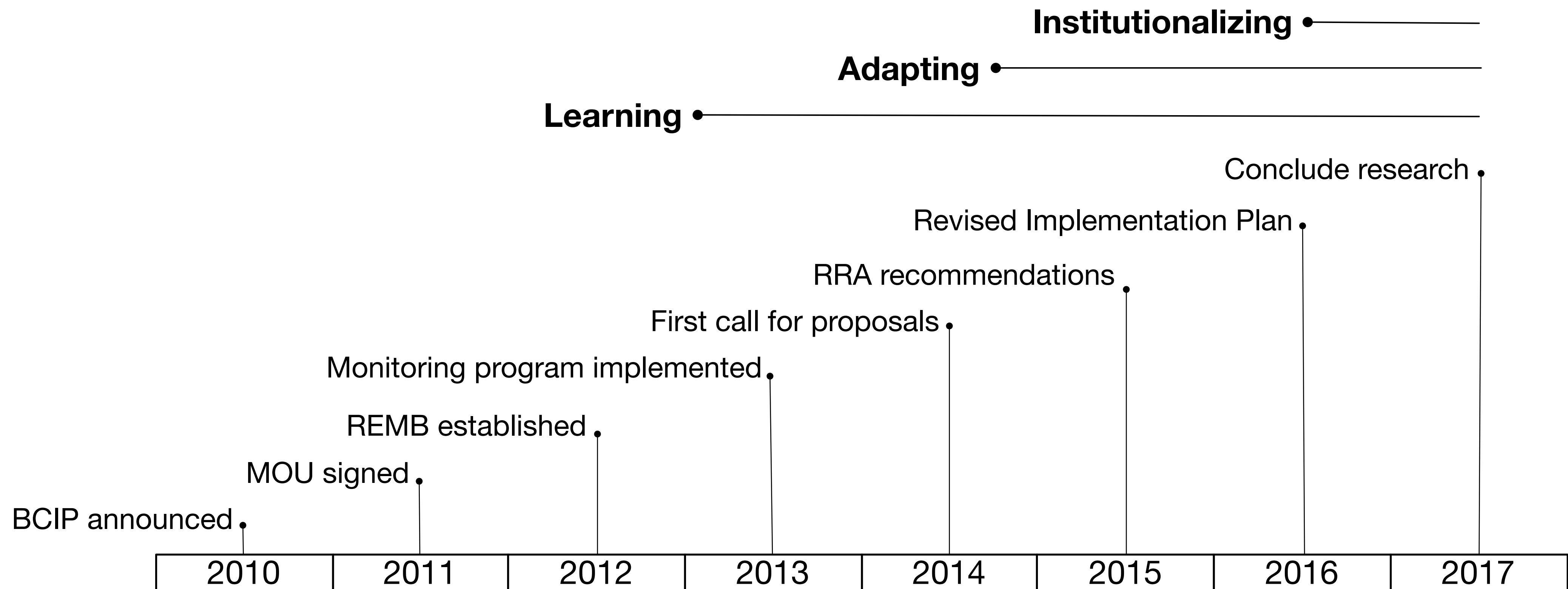
**BC Boreal Caribou
Research and Effectiveness
Monitoring Board**
ANNUAL REPORT 2015



BC BOREAL CARIBOU
RESEARCH AND EFFECTIVENESS
MONITORING BOARD
ANNUAL REPORT 2016



TIMELINE



WIND-DOWN

- MOU extended without additional funding to July 2018
- Majority of projects ending by March 2017
- Post-restoration monitoring in Parker range continues in 2017-2018
- 130 active collars on caribou (as of Oct 2016) - habitat use, mortality and recruitment monitoring will continue
- Fund balance approximately \$500K



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

Excerpted from the
**BC BOREAL CARIBOU
RESEARCH AND EFFECTIVENESS
MONITORING BOARD
ANNUAL REPORT 2016**

DESIGN: Alaris Design ILLUSTRATION: Soren Henrich

Research

Explanation

Policy

Prediction

Management

Monitoring



An aerial photograph of a vast, flat, dry landscape, possibly a salt flat or a desert. The ground is covered with sparse, low-lying vegetation and patches of white, possibly salt or sand. A winding road or path is visible, cutting through the landscape. The horizon is flat and distant, with a hazy sky above.

CRITICAL QUESTIONS

- Cause, consequence, risk factor or artefact?
- Strength of conditional dependencies?
- Necessary and sufficient strategies?
- Feasibility?

CAUSE, CONSEQUENCE, RISK FACTOR, ARTEFACT?

- Anthropogenic footprint
- Forest cover variables
- Linear feature density
- Wolf density
- Disease
- Nutrition
- Moose density
- White-tailed deer density
- Beaver populations
- Climate trends
- Snow crusting events
- Packed trails
- Sensory disturbance
- Body fat
- Pregnancy rates
- Wolverine populations
- Black bear density
- Hunting

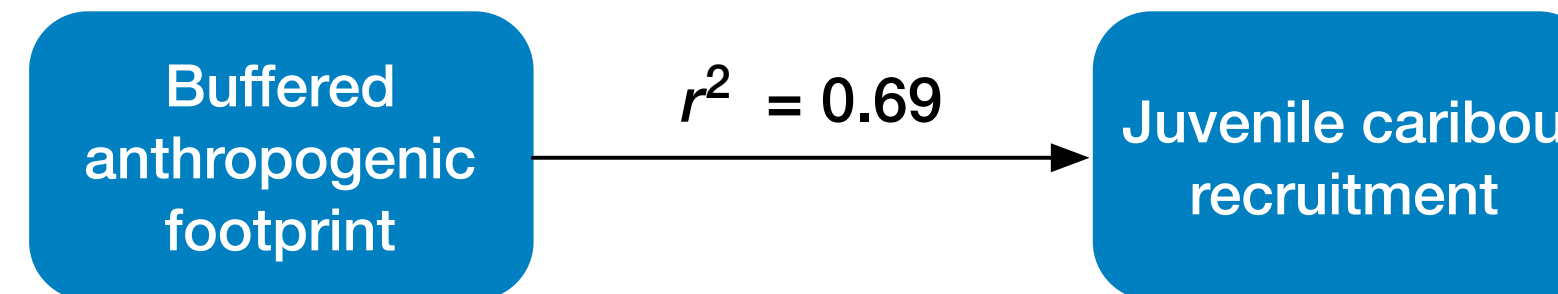
STRENGTH OF CONDITIONAL DEPENDENCIES

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- **Hunting**

NECESSARY & SUFFICIENT



	Declining	Stable-increasing	
>65% undisturbed	3	9	Sufficient?
<65% undisturbed	11	9	
	Necessary?		

FEASIBILITY

What is our solution space?

- Climate drivers
- Economic trade-offs
- Technical feasibility
- Social acceptability



THE FUTURE



- Further developing the theoretical framework
- Improving our predictive ability
- Defining the solution space
- Resource allocation

ARTICLE

Boreal Caribou in British Columbia: a Tale of Research and Management

As the figurehead of the 25 cent coin, caribou are familiar to most Canadians, even if they have never seen the animal itself. Indeed, caribou occur across Canada, except for the Maritimes, and occupy habitats ranging from bogs to mountain tops, to the arctic tundra. These curious and charismatic animals are experiencing population declines throughout the country, whether they live in boreal, mountain or barren-ground areas.

British Columbia is home to three ecotypes of caribou: 1) boreal caribou, which live in the peatlands in the northeastern corner of the province, 2) northern mountain caribou, and 3) southern mountain caribou. Although the latter two both live in mountainous areas, they use their habitats differently. Boreal caribou are considered Threatened across Canada and within BC, and are therefore a focus for management efforts.

As concerns over boreal caribou in BC grew, in 2011 the Province of BC released the “*Implementation Plan for Ongoing management of Boreal Caribou (Rangifer tarandus caribou pop. 14) in British Columbia*”, also known as the BCIP. The BCIP identified several actions needed to decrease the rate of decline of boreal caribou in BC, and recognized the need for a Board to coordinate research and monitoring efforts. Thus was born the Research and Effectiveness Monitoring Board (REMB), comprised of members from both government and industry with a

shared passion for caribou. Research and monitoring work has been funded through an agreement between industry and government, whereby fees and levees for industrial development are channeled towards boreal caribou.

Although small-scale, sporadic surveys had been conducted for boreal caribou in BC, nobody knew how many caribou resided in BC, or whether they were declining in the same way as other populations across Canada. One of the REMB's first tasks was to conduct one of the largest radio-telemetry programs on boreal caribou in Canada: 160 boreal caribou were fitted with radio-collars around their necks. The capture and collaring work was conducted by Brad and Diane Culling (both RPBios) of Fort St. John, two

people with an extraordinary passion for caribou. The telemetry program is continuing to produce data on how boreal caribou use habitat in BC, how they live and die, and how many reside in BC.

According to the latest population count in March 2016, at least 728 boreal caribou occur in BC's herds. Three of these herds share boundaries with Alberta or the Northwest Territories, and since caribou wander between jurisdictions, the population count is a minimum estimate. Surveys of collared caribou have also provided us with information on the number of caribou calves that survive their first ten months. Unfortunately, it's a tough world for baby caribou, and in 2015-16 only one-fifth



Photo submitted by: Megan Watters, RPBio.

MEMBER PROFILE

Megan Watters, RPBio, PBiol, MSc

Ecosystem Biologist, Ministry of Forests, Lands & Natural Resource Operations, Fort St. John



To what do you attribute your interest in biology, and when did you first become aware of your interest in the discipline?

As the offspring of a geologist and a marine geophysicist, I suppose I was bound to become a scientist of some variety, either by nature or nurture. Much to my geologist fathers' disappointment, I found rocks rather boring (I recall moaning as a child that “rocks don't do anything!”), and since I grew up in Saskatchewan, had little use for marine geophysics. For a number of years I wanted to be a physician and took the requisite courses, but eventually realized that I lacked the emotional tenacity to be an effective doctor. It wasn't until I enrolled in Dr. Mark Brigham's animal behaviour course at the University of Regina that I found my calling; Mark's enthusiasm about biology inspired me to pursue a career in the discipline.

What is your academic background?

I earned my Bachelor of Science degree with honours at the University of Regina, under the tutelage of Mark Brigham. I was fortunate to have the opportunity to study endangered Greater Sage-Grouse for my honours project, which first sparked my interest in species at risk. I then pursued a Master's of Science degree in environmental biology at the University of Alberta with Dr. Evelyn Merrill, for which I researched the effects of elk grazing on grasslands in Jasper National Park. Aside from getting to spend six months of the year for several years in Jasper, I had the opportunity to round out my knowledge base with an improved understanding of ecology.

What do you do on the job and what are your favourite aspects of the work?

My job as an Ecosystems Biologist with the Ministry of Forests, Lands and Natural Resource Operations has provided many opportunities to grow professionally and personally. As a public servant, one of my responsibilities is to provide the public with information on ecosystem values and measures to protect these values. I consider myself fortunate to specialize in caribou, a species that has long fascinated me. As the regional representative on the BC Research and Effectiveness Monitoring Board (the government and industry group tasked with implementing management actions for boreal caribou), I am involved in the direction of many research projects that are improving our understanding of BC's boreal caribou populations and how these animals use their landscape. I am also part of the team applying the information gained from research to develop management

plans and strategies for recovering boreal caribou in BC. As an Ecosystems Biologist in the northeast region of BC, I am also involved in the management of northern caribou, including monitoring; establishing Ungulate Winter Ranges and Wildlife Habitat Areas, which provide a measure of protection for caribou and other species of interest; mitigation and offset of industrial impacts to caribou; and sharing information on northern caribou with stakeholders. My job has also afforded me the chance to contribute to the ever-growing body of literature on caribou.

My favourite aspect of my work is, without a doubt, being involved in caribou research and management. Anyone who has worked with me will attest to the fact that I'm passionate about caribou, and it means the world to me to be a part of the “caribou story”. I also enjoy sharing the caribou story in the hopes that others will be as captivated by this charismatic species as I am.

Which practice area is beyond the scope of your current work that you would most like to become involved in or what would your ideal biology-related job or project be?

My job as an Ecosystems Biologist is the culmination of many years of searching for that “perfect” job, which would provide opportunities to conduct meaningful work that I am passionate about. I have found my niche in the wide and wonderful world of biology; it just doesn't get much better than that! I hope to continue working on caribou and other species at risk, and sharing their stories with biologists and non-biologists alike. 