B.C. Provincial Caribou Recovery Program

ANNUAL REPORT

2018–2019

Caption: Two bulls from the Kennedy Siding herd

Credit: Ministry of Forests, Lands, Natural Resource Operations and Rural Development

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Message from the Director

British Columbia is home to three distinct populations of woodland caribou: Northern Mountain, Boreal and Southern Mountain Caribou. Over the last century, significant changes within the caribou's preferred habitat have contributed to their population decline. Less than 50 years ago approximately 40,000 caribou resided in B.C.; today there are less than 15,000 province-wide. Boreal Caribou and Southern Mountain Caribou (SMC) have seen the most significant declines resulting in listings as threatened under the federal *Species at Risk Act (SARA)*. Northern Mountain Caribou are listed as special concern. The primary immediate cause of caribou population decline is increased predation resulting from the shift from older contiguous forests preferred by caribou to landscapes comprised of younger forests fragmented by human-caused habitat alteration to support development.

The Government of Canada (Canada) addressed their concerns about this decline through their 2014 proposed *Recovery Strategy for the Woodland Caribou, Southern Mountain population (Rangifer tarandus caribou) in Canada* (Recovery Strategy)[1]. The Recovery Strategy sets out Canada's expectations for recovery. In response to this and declining population numbers, the Province of British Columbia (Province) committed $47 million over five years (2017–2022) to develop and implement an extensive Provincial Caribou Recovery Program (Program) to bolster existing actions intended to maintain, stabilize and/or recover the province's 55 individual caribou herds, and entrench the Province's provincial approach to address recovery concerns.

Caribou recovery in B.C. is a complex and challenging issue. There are no simple solutions and success is dependent on a unique blend of short- and long-term management actions built on a foundation of sound science and meaningful effort by deeply involved parties. Through engagement and partnership, program staff are striving to ensure that recovery planning and implementation reflect Indigenous values, interests and perspectives and that recovery efforts contribute to community and stakeholder stability. By listening to our partners and investing in areas where the data suggests our opportunities to recover caribou are highest, the Program is determining the approach for recovery for each herd in a manner that is both respectful to the people who live close to these herds and effective in maintaining caribou populations in these areas for generations to come.

B.C. recognizes that caribou recovery may not be practical in every herd range. Some herds' habitat has been disturbed to the point that they are beyond realistic restoration; other herds have been extirpated for so long that focus on them now would take away resources from areas with immediate concerns; while other areas of the province are facing such significant climate change pressures that recovery is not possible.

The Program is currently classifying herds to better focus our recovery efforts in places where investment is most likely to have an impact on maintaining and recovering caribou populations. Immediate efforts are focused on stabilizing SMC and Boreal herd populations and are further described in this report. The decline of caribou populations in B.C. requires a thoughtful, inclusive process to stabilize populations and build a broadly supported successful Caribou Recovery Program.

Darcy Peel, 2019

Director, British Columbia Provincial Caribou Recovery Program

Species at Risk Recovery Branch

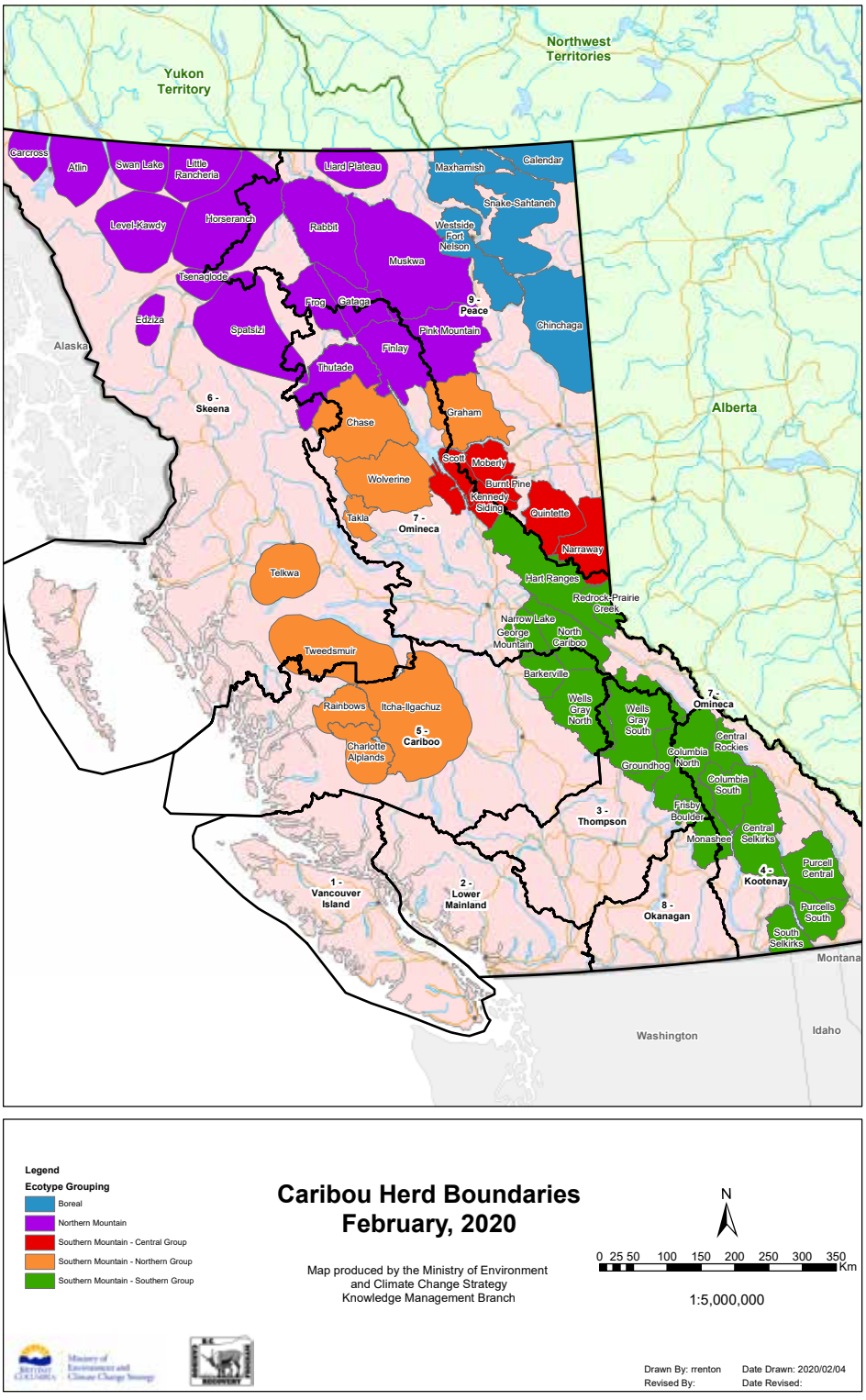
Resource Stewardship Division

Ministry of Forests, Lands, Natural Resource Operations and Rural Development

1 https://www.registrelep-sararegistry.gc.ca/virtual_sara/files/plans/rs_woodland_caribou_bois_s_mtn_pop_0114_e.pdf

Map of Caribou Herds in British Columbia

Figure 1 – Map of Caribou herds in BC: Southern Mountain Caribou (SMC) occur in the southern two-thirds of B.C. Three groups of Southern Mountain Caribou are recognized based on ecological and evolutionary distinctions between them: the Northern Group in west-central and north-central B.C. (orange); the Central Group in east-central B.C. and west-central Alberta (red); and, the Southern Group in southeastern B.C. (green)



Introduction

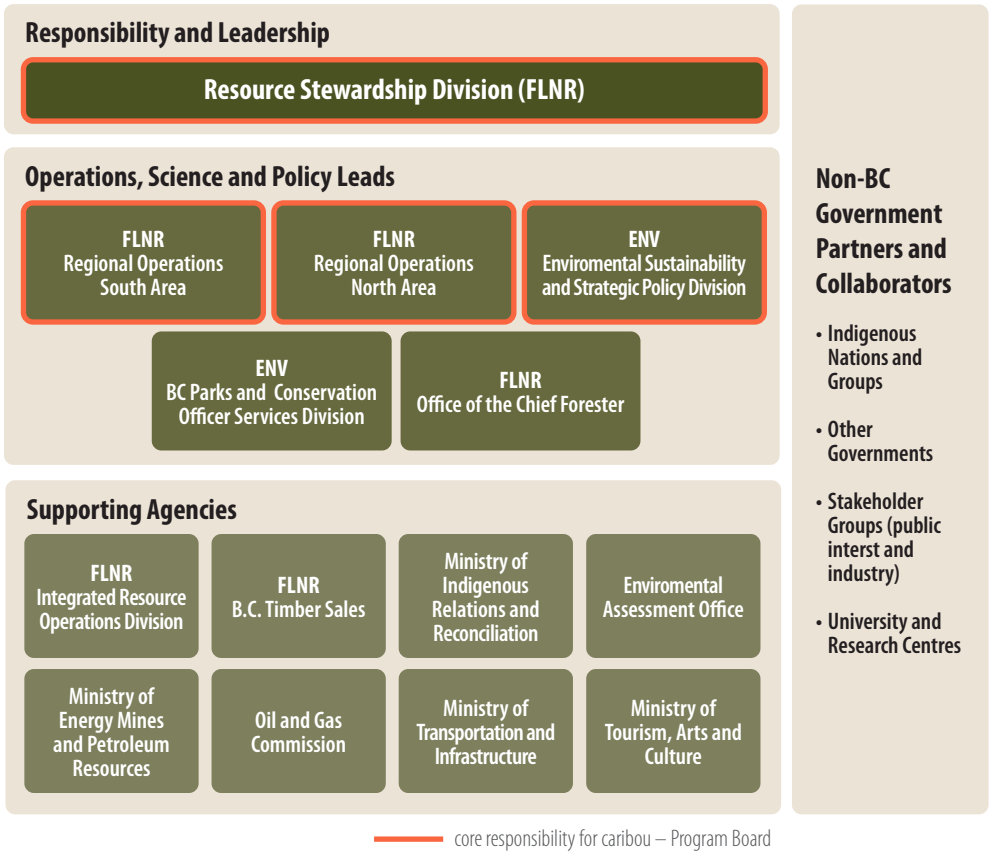
B.C. is committed to caribou recovery. Short- and long-term recovery measures have been implemented or planned for the majority of herds across the province. This report summarizes the key elements of the Provincial Caribou Recovery Program (Program) during its second year (Fiscal Year April 2018 to March 2019; hereafter "FY 2018/19"). Progress on many of the actions described herein has occurred and will be described in forthcoming annual reports.

Program Governance and Priorities

Historically, the 55 caribou herds[2] in B.C. were managed separately under six different administrative regions. In 2017, the Province centralized all caribou-related planning, management and resourcing into a newly created Provincial Caribou Recovery Program which transformed its approach to managing caribou. The Program is led by the Ministry of Forests, Lands, Natural Resource Operations and Rural Development's (FLNR) Resource Stewardship Division (RSD) and jointly delivered with FLNR regions and the Ministry of Environment and Climate Change Strategy (ENV) with support from other ministries and agencies. Strategic direction is provided by the Assistant Deputy Minister.

Recovery efforts are delivered, through program areas, by leads responsible for work undertaken across the province. This structure enables a responsive, adaptive and unified provincial approach to recovery.

Figure 2: Divisions with responsibility for caribou recovery under the Program

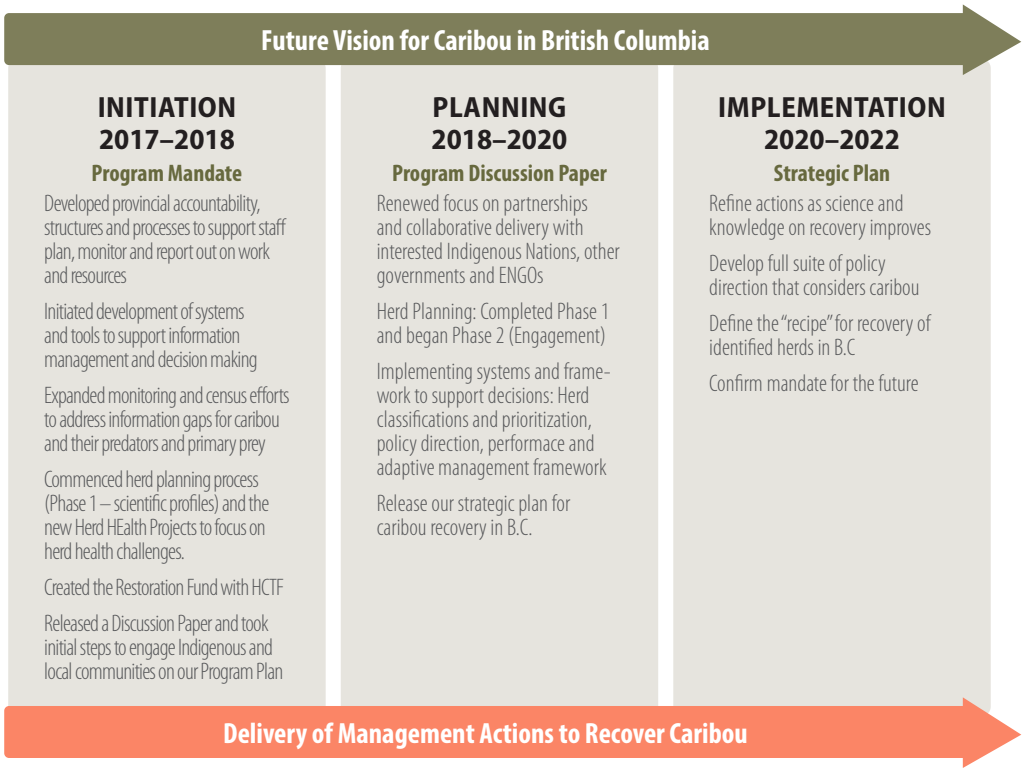


2 Previously 54 herds, provincial biologists designated Red Rock Prairie Creek a herd in 2019

The Program's Strategic Framework is grounded in its Vision, Mission and four Goals (See Figure 3). Goal A is the 'beacon goal' where habitat and population management actions take place; Goals B-D capture supporting actions that the Program is undertaking to accomplish Goal A. This Framework is expected to be confirmed in 2020 as the Program moves from the Planning to the Implementation phase.

In FY 2018/19, the Program was in the planning stage (Figure 3) and is working to help define the future vision for caribou in B.C..

Figure 3: Program stages and priorities over time.



Program Expenditure

Building on an original investment of $27 million over three years (2017), the provincial government provided an additional $20 million in FY 2018/19 and extended the Program for an additional two years until March 2022.

In FY 2018/19, the aggregate investment in caribou recovery was $10.5 million comprised of contributions from the Province - both FLNR and the B.C. Ministry of Indigenous Relations and Reconciliation (MIRR) - and Canada. Weather challenges and timing of when funding was received contributed to a budget underspend of roughly $760,000 or 93% of projected investment (Table 1).

Table 1: Program Budget

Funding Source	Budget	Actual Investment
B.C. – FLNR	$8,485,000	$7,750,532
B.C. – MIRR	$582,000	$582,000
Government of Canada	$2,200,000	$2,172,158
TOTAL	**$11,267,000**	**$10,504,690**

Residual funding was recovered through Program investment in the Habitat Conservation Trust Foundation (HCTF) Caribou Habitat Restoration Funds[3] and through funding held by the Fraser Basin Council (FBC)[4] (Table 2).

Table 2: Residual funds from external sources

Recovered Source	Investments
HCTF Caribou Habitat Restoration Fund	$169,044
Fraser Basin Council Funds	$387,304
TOTAL	**$556,348**

In total, the Program managed **$11,061,038** in caribou recovery funding on behalf of the Province. This does not account for additional, in-kind contributions from other sources (e.g., staff who are not funded by the Program but work on Program projects), thus adding further value to the Province's investment in caribou.

3 For more on the HCTF Fund, please see "Restoration" under Goal A

4 Fraser Basin Council - Enhanced Wildlife Management Model Development

Strategic Framework

The Program's Strategic Framework is grounded in its vision, mission and four goals (Figure 4). Goal A is the `beacon goal' where habitat and population management actions take place; Goals B, C and D capture the supporting actions that contribute to the success of Goal A. This framework is expected to be confirmed in 2020 as the Program moves from the planning to the implementation stage and is therefore subject to slight adjustments.

Figure 4: Program Vision, Mission and Goals

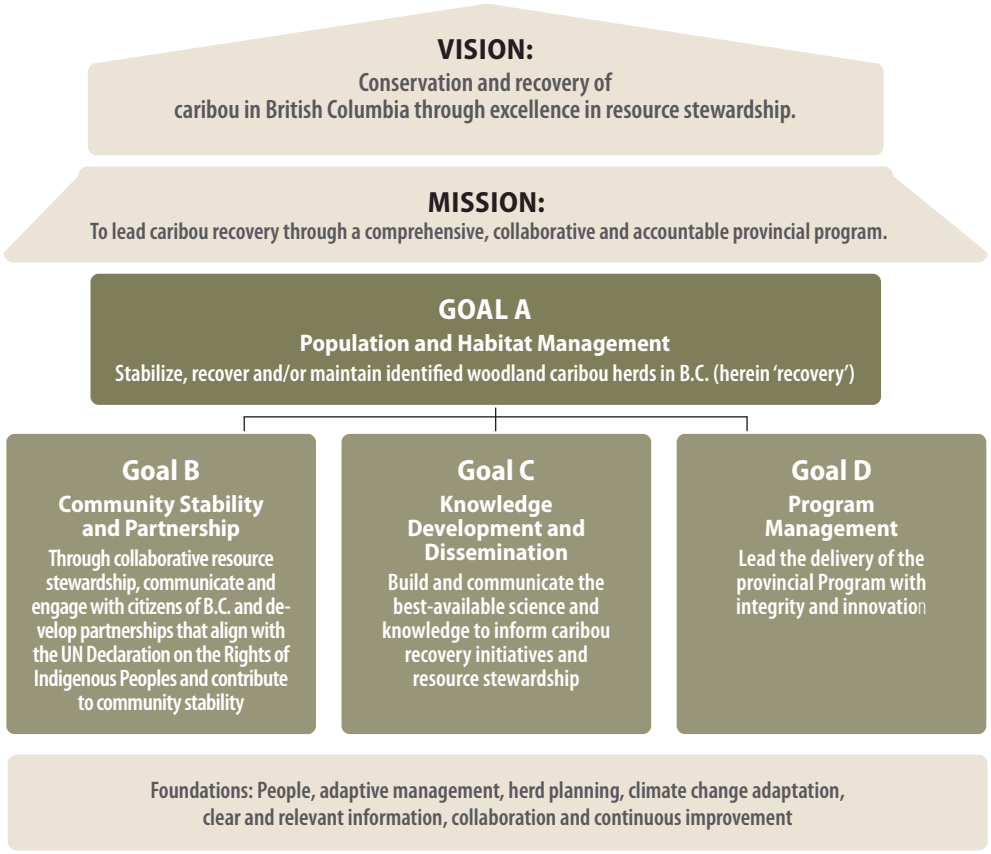
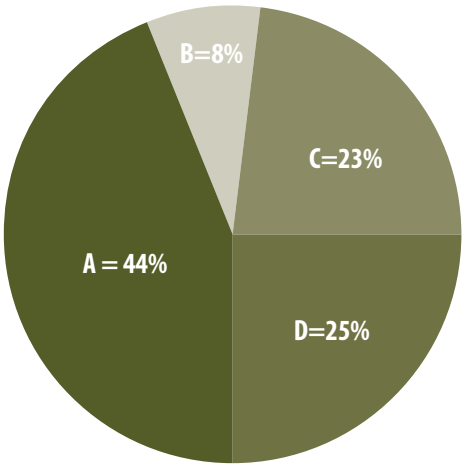
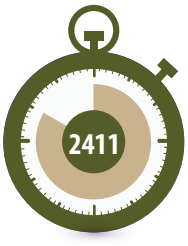


Figure 5: Investment by Goal

In FY 2018/19, the Province focused investment in actions related to Goal A: Population and Habitat Management (Figure 5). The remainder of this report describes Program activities by Goal.



$2M – amount invested in HCTF Restoration Fund



2,411 Conservation Officer hours related to caribou recovery

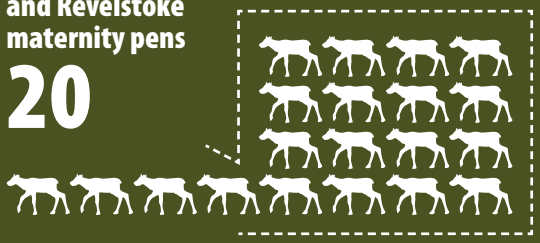
Formally engaged

122

Indigenous communities and organizations

Number of calves released from Klinse-Za and Revelstoke maternity pens

20



180

WOLVES REMOVED

Worked on projects in collaboration with over

50

different partners

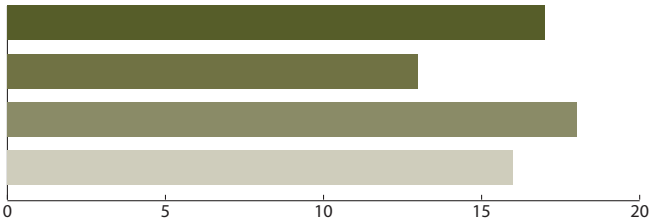
8

Predator reduction in 8 herds (and benefit extended to 2 more)

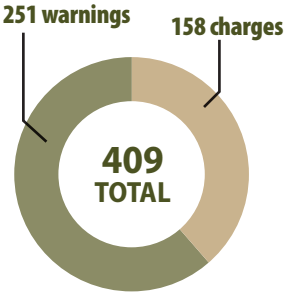
Health samples processed from **523** field kits

7,600 kg of supplemental feed consumed by Kennedy Siding herd

1 orphan caribou calf named Grace who won our hearts



- Deployed 212 additional collars in **17 herds**
- Population estimate surveys in **13 herds**
- Calf recruitment and calf surveys in **18 herds**
- 21 predator and primary prey surveys in **16 different herd areas**



Enforcement actions in herd areas

3 **caribou successfully translocated from functionally extirpated herd**

Investigated **40** caribou mortalities

GOAL A – Population and Habitat Management

Stabilize, recover and/or maintain identified woodland caribou herds in B.C.

Goal A includes policies and management actions used to directly influence or manage habitat and populations. In the coming fiscal year, as the Program prepares to move into the implementation stage, staff are designing a process to determine how new policies and actions will most efficiently and effectively be applied to manage each herd to achieve self-sustaining status.

In FY 2018/19, the Program implemented management actions and measures in nine categories.

Habitat Management Actions:

- Habitat Protection and Forest Policy
- Access, Adventure Tourism and Recreation Management and Enforcement in Parks and Protected Areas
- Habitat Restoration including the $2M HCTF Restoration Fund

Species Management Actions:

- Predator Reduction
- Primary Prey Management
- Caribou Harvest Management
- Maternity Penning
- Translocation
- Supplemental Feeding

Staff implemented on-the-ground management actions and planning measures in 25 caribou herds (Appendix 1). The overwhelming majority (94%) of these actions were within the threatened SMC herds.

Decisions on how and where actions occur are guided by Caribou Program Board direction. Staff recommend actions to the Board that consider risk, the best available science and input from partners and stakeholders to determine where management actions and planning measures will most logically be needed and effective.

Table 3: Management actions and planning measures along with the number of herds where each action was implemented

Management Action or Planning Measure	# of Herd Areas Where Actions Occurred
Habitat Protection Measures	4
COS Patrols of Closed Areas	16
Habitat Restoration	6
Predator Reduction	10[5]
Primary Prey Management	4
Maternity Pen	3
Translocation	2
Supplemental Feeding	1

In the description for each section herein, we list "Partners". For the purpose of this report, our partners are individuals and organizations who worked formally or informally with the Program to advance caribou recovery.

5 Tweedsmuir Lichen Restoration Trial; Year 2 Report – Project Monitoring; prepared by L. Rolands, R.P. Bio

Herd Range: The geographic area occupied by a subpopulation (individual herd) is referred to as a **'range'.** Caribou ranges have been defined based on extensive studies of the movements and seasonal habitat use of radio-collared caribou.

Habitat Protection and Management

Caribou require large home ranges and have complex habitat requirements. Human and natural disturbances have reduced caribou survival in many herd range areas.

Consumptive Use of Habitat

`Consumptive use' means that a resource is used, and potential removed, typically by a single user. Common examples of consumptive use in caribou habitat are forestry, resource exploration and extraction and the roads and seismic lines created to support them. These activities can permanently alter caribou habitat and change the way caribou use and travel within their habitat, thus increasing their risk of mortality from predation and other causes.

Non-Consumptive Use of Habitat

`Non-consumptive use' means that a resource is not removed or substantially altered and is typically used by multiple parties. Common examples of non-consumptive use in caribou habitat are tourism and recreation activities involving off-road vehicles, snowmobiles and helicopters. Linear disturbance and noise from such activities can significantly alter caribou behaviour and how they use and move within their habitat. Many of these activities occur in winter, which means that caribou must expend more energy in winter when caloric intake is lowest, effectively increasing their risk of mortality from predators and other causes. Summer activities can also displace caribou from their preferred habitats.

Management Actions to Manage Habitat Use

The Program uses legal and policy mechanisms along with physical site enhancements to protect, manage and restore habitat. Complementing these are compliance and enforcement actions to compel recreational and tourism users to avoid areas occupied by caribou and to prevent illegal harvest actions.

Caption: Central Group cows and calves.

Credit: Ministry of Forests, Lands, Natural Resource Operations and Rural Development

HABITAT MANAGEMENT, PROTECTION AND FOREST POLICY

Lead: FLNR – Regional Operations, Office of the Chief Forester and Resource Stewardship Division

Partners: Members of the Provincial Forestry Forum Caribou Forestry Working Group - Industry, Resource Districts and B.C. Timber Sales

Herds: SMC herds, Chase, Wolverine, Talka and Tweedsmuir

Program Investment: $27,600

Habitat loss and fragmentation are the most significant risks facing all species. Habitat protection is the most effective tool to protect or mitigate these risks; however, protections can also limit human access to natural resources and apply stress to the economic viability of existing economies and local communities. The Program acknowledges the need for multiple values on the land base and is taking steps to identify management options to mitigate impact and ensure protections are strategic and effective. In FY 2018/19, the Program undertook projects to improve B.C.'s understanding of future habitat needs, consider key pressures to improve policy and protect and monitor key herd ranges.

FLNR staff regularly discuss caribou issues at a regional/area level through the Operational Issues Forum (South and North). This, however, was not enough for the strategic planning needed for the sector. Program staff led the creation of the Provincial Forestry Forum Caribou Forestry Working Group (PFF CFWG). The purpose of this group is to keep industry informed of provincial caribou-related actions and provide a venue of communication and collaboration between the Program and the forest industry. In FY 2018/19, the PFF CFWG developed a synopsis of forest sector Beneficial Management Practices (BMPs), worked to understand and refine socio-economic impacts associated with anticipated recovery actions and informed the federal government of the positive activities that the Province and B.C.'s forest industry are undertaking to assist in achieving a sustainable population of SMC and healthy resilient forests within B.C.

The Program funded, or otherwise supported, the following projects to improve the effectiveness of management and protection tools for caribou recovery. Program investments in habitat protection and forest policy are related to the analysis and implementation of protections and do not relate to the incremental area that has been protected or managed to support caribou recovery:

- Ungulate Winter Range 0.7.025/26 (Chase, Wolverine, Takla herds) - Effectiveness monitoring in progress; wildlife ecologists interpreting laboratory results to see how silviculture practices influence nutritional outcomes.
- Ungulate Winter Range 015/007 (Chase, Wolverine, Takla herds) - Amendments to completed report to support recommendations to the herd ranges.
- Wildlife Habitat Area - Defining linework (Whitesail Calving Range within the Tweedsmuir herd range); refinements in progress to *Government Action Regulation (GAR)* polygons and General Wildlife Measures within Nadina Resource District.

ACCESS MANAGEMENT IN PROTECTED AREAS

Program staff, FLNR regional staff and ENV Parks staff work to further understand the detrimental effects of non-consumptive use activities on caribou populations. This informs where stakeholder education/collaboration, prescribed closures in herd ranges and other protection and management measures will be most effective[6]. FLNR Natural Resource Officers and the Conservation Officer Service (COS) support land managers to deter or change illegal behaviours in these closed herd ranges and within B.C.'s parks and protected areas through:

- Outreach to deter illegal access to closed areas (e.g., outreach to snowmobile clubs via trade shows and social media posts)
- Compliance operations to monitor use and enforce existing legislation to protect caribou and caribou habitat (e.g., patrols, surveillance and response to complaints)
- Enforcement actions to compel changes in the behaviour of violators (warnings, violation tickets and charges, court proceedings and seizure of equipment)

Caption: Snowmobile tracks in closed caribou habitat - Omineca Region

Credit: Ministry of Environment and Climate Change Strategy - Conservation Officer Service

6 Closures are prescribed under the *Motor Vehicle Prohibition Regulation (Wildlife Act)* and the *Parks Act*. Recreation access is also regulated under the *Off Road Vehicle Act*.

Recreation Management

Lead: FLNR – Resource Stewardship Division and Regional Operations

Partners: HeliCat Canada (HCC), Houston Snowmobile Club and Smithers Snowmobile Club

Herds: All

Program Investment: $77,800

In FY 2018/19, the Program researched management options and issues related to tourism and recreation activity and their effect on caribou populations, movements and habitat use within tourism tenures. Historical flight caribou sighting data collected by helicopter and snowcat guides and pilots were submitted by operators under a now-expired agreement with HeliCat Canada (HCC). Negotiations to re-establish the agreement and obtain current information were unsuccessful in FY 2018/19.

The Program funded monitoring and management of a 100,000 hectare motor vehicle closure under the *Wildlife Act* in the Telkwa herd range to ensure effectiveness of the closure at minimizing disturbance to caribou. This included new signage, winter compliance flights and installation of a satellite remote camera at a key access point.

The Program also contributed to early work on SMC Central Group snowmobile engagement regarding proposed recreational closures at high elevations. This included process direction through the draft Tri-lateral Partnership Agreement. Work was placed on hold during negotiations (see Goal B for information on this Agreement).

Parks and Protected Areas Management

Lead: ENV – B.C. Parks and Conservation Officer Service Division

Partners: None

Herds: All

Program Investment: $30,100

In FY 2018/19, ENV staff updated planning materials and best practices for managing caribou in B.C.'s protected areas system and supported staff with resources and training. Staff also prepared a working draft of a document to clarify the role that the protected area system plays in caribou recovery with park-specific advice. Parks and Conservation Officer Service staff collaborated on patrols to assess snowmobile use in protected areas. Park ecologists contracted a review of the impacts of heli-skiing on caribou including recommendations for improvements to park use permits. Key compliance patrol staff received avalanche safety training to allow them to more safely monitor caribou habitat via snowmobile.

Caption: Conservation Officer Service Patrol Vehicle

Credit: Ministry of Environment and Climate Change Strategy - Conservation Officer Service

Compliance and Enforcement

Lead: ENV – B.C. Parks and Conservation Officer Service Division

Partners: Parks Canada, Royal Canadian Mounted Police (RCMP)

Herds: 16 - See Appendix 1

Program Investment: $433,300

During FY 2018/19 FLNR regional staff and the COS attended trade shows and public events and generated caribou-related social media posts which reached almost 100,000 users. Sixty-two COS Officers carried out 2,411 hours of effort in five COS regions: Skeena, Peace, Omineca, Thompson-Cariboo and Kootenay, comprising 16 herd areas. In total, these Officers had contact with 2,231 individuals, resulting in 158 charges and 251 warnings. Four snowmobiles were seized, and other incidents of non-compliance remain under investigation or are awaiting charge approval. The RCMP Air Services also provided 13 helicopter patrols to the COS at no cost.

Finally, the COS reviewed the effectiveness of fine amounts to deter violations in habitat closed to snowmobiles. This work resulted in fine increases for violations under the *Wildlife Act* and the *Park Act* in closed snowmobile areas (from $230.00 to $575.00). This fine increase and maximum fine amounts were publicized at the start of snowmobile season to encourage compliance.

HABITAT RESTORATION

Lead: FLNR – Regional Operations

Partners: Habitat Conservation Trust Foundation (HCTF), Yucwmenlucwu LLP, Office of the Wet'suwet'en Nation, Southern Dakelh Nation Alliance, Skin Tyee Band and the Nee-Tahi-Buhn Band, Cheslatta Carrier Nation, Society of Ecological Restoration in Northern B.C. and University of Northern British Columbia, Forest Enhancement Society, Nîkanêse Wah tzee Stewardship Society, Fort Nelson First Nation

Herds: Tweedsmuir - Entiako, Telkwa, Columbia North, Quintette, Snake-Sahtaneh, Chase

Program Investment: $2,963,500

Restoring caribou habitat is a key component of medium- and long-term caribou population recovery and maintenance. The Program funded development of a draft framework for caribou habitat restoration as a "how to" guide for internal and external delivery agents of caribou habitat restoration in B.C. (expected in 2020). It purchased 'off the shelf' satellite imagery (SPOT archive imagery) for SMC herds to inform restoration and other caribou recovery initiatives and installed cameras to monitor previously restored linear disturbances in the Quintette herd range. Program staff also provided preliminary planning support for restoration projects managed by external parties in the Snake-Sahtaneh and Chase herd ranges.

B.C. and the Habitat Conservation Trust Foundation (HCTF) signed a multi-year agreement in February 2019 in support of the creation of a $6.5 million Caribou Habitat Restoration Fund administered by HCTF. The Program contributed $2 Million to the Fund in FY 2018/19 which will be used to support tactical planning and delivery of habitat restoration activities in herd ranges identified as high priority for restoration. Funding is available to internal- and external-to-government applicants whose proposals are consistent with principles and criteria provided by the Program and approved by HCTF.

In FY 2018/19 an initial internal call for proposals generated funding totaling $418,000 for five FLNR-led proposals; $169,000 was put toward projects in this fiscal year:

- $21,000: Supporting the restoration of over five kilometers of road and the establishment of treatment monitoring in the Columbia North herd range. Fieldwork was conducted by partners from the Yucwmenlucwu LLP.
- $138,000: Initial development of two tactical restoration plans for the Telkwa and Tweedsmuir herd range areas, including prioritization of areas and features for restoration and updated disturbance mapping. Work was done in cooperation with Office of the Wet'suwet'en Nation, Southern Dakelh Nation Alliance, Cheslatta Carrier Nation and Skin Tyee Band and the Nee-Tahi-Buhn Band.
- $10,000: Lichen restoration monitoring project in Tweedsmuir herd range to test the use of lichen restoration to accelerate the recovery of critical winter habitats post-fire. The results showed that lichen survival 1-year post seeding is viable similar to naturally occurring lichen. Work was completed in partnership with Cheslatta Carrier Nation, Society of Ecological Restoration in Northern B.C. and University of Northern British Columbia and published in March 2019.

Caption: Photo of Charlene Peters, Lichen Field Technician, Cheslatta Carrier Nation

Credit: Irene Ronalds, RPBio

Quote from

Charlene Peters, Lichen Field Technician, Cheslatta Carrier Nation

"As a member of the Cheslatta Carrier Nation, I am honoured to be involved in this project to begin restoring the presence of lichen in the caribou habitat within our territory. In my language, I call this exercise "nastl'oo", which means repairing by trying. We are involved in a rare chance to help reseed and grow the primary food source for our caribou, which is on the brink of gone. Our territory has undergone substantial impacts over the last few decades with flooding, huge fires and clearcut logging. This is my chance to do my part in an important project to sustain and enhance the caribou which historically were an important source for food and sustenance for my ancestors."

Species Management

Population increases are difficult to achieve with habitat management alone. Years of effort and studies have shown that the benefits of protection measures are minimal in the short term without intensive management of the immediate cause of population decline: a high rate of predation that is out of balance from the natural cycle. The most significant predators of caribou in order of impact to herds are wolves, cougars and bears[7].

This imbalance can happen when natural events (e.g., forest fires) and human activity (e.g., urbanization, forestry and roads and other linear development supporting oil and gas exploration[8]) convert large areas of mature forests to young forest landscapes ("early seral habitat"). This habitat provides ideal forage for other ungulates such as deer, elk and moose. These other ungulates are the "primary prey" of caribou's predators (i.e., the predator's preferred food source). So, as primary prey species are attracted to new forage in caribou habitat, wolves and other predators follow and consume caribou as a "secondary prey".

The Program controls predation threat using a variety of management actions to limit forage for other ungulate populations, protect caribou from predation (interspecific species management) and improve their overall condition (population management).

INTERSPECIFIC INTERACTION MANAGEMENT

The interaction of caribou, predator and primary prey populations can be managed to the benefit of caribou by either managing the habitat composition to support less primary prey, actively reducing the primary prey populations so that the landscape supports less predators or directly reducing wolf populations.

Interspecific interaction management *is used to describe management a that impact a target species through the management of other species. The other species are invasive or problematic and may or may not have originally been found in the area in question. Its increasing presence can lead to an ecosystem imbalance and is directly or indirectly caused by human activities.*

Wolves are caribou's most significant predator. Unlike caribou, wolves are not at risk. Populations are estimated to be between 5,300 and 11,600 (mean 8,450)[9]. Wolves are not highly sensitive to habitat disturbance and breeding pairs of wolves typically produce four to seven pups a year, allowing for rapid wolf population growth[10]. Wolves have recolonized areas in the south of the province from which they were once extirpated by decades of bounties and poisoning. Caribou have co-existed with other predators like wolverine and grizzly bears for centuries and are expected to be able to sustain low-level mortality rates from these predators.

The Program controls predators and manages primary prey for the benefit of caribou.

7 Based on the data collected to date in areas heavily impacted by predation

8 Forestry: accelerated harvest due to a massive mountain pine beetle infestation and the following salvage harvest (Wittmer et al. 2007, McLellan et al. 2010)

9 Management Plan for the Grey Wolf (*Canis lupus*) in British Columbia (2014) http://www.env.gov.bc.ca/fw/wildlife/management-issues/docs/grey_wolf_management_plan.pdf

10 Caribou cows typically give birth to one calf per year

Caption: A wolf crossing the tracks of 16 caribou from the Columbia North herd.

Credit: Ministry of Forests, Lands, Natural Resource Operations and Rural Development

Caption: Biologists estimate that this wolf chased a group of caribou for 24 hours. In this time, the herd travelled over 20 kilometres and a total elevation change of 13,000 feet to escape predation.

Credit: Ministry of Forests, Lands, Natural Resource Operations and Rural Development

PREDATOR REDUCTION

Lead: FLNR – Regional Operations

Partners: Doig River First Nation (Chinchaga), West Moberly and Saulteau First Nations via Nîkanêse Wah tzee Stewardship Society Klinse-za - Moberly and Scott herd ranges), Blueberry River First Nations (Pink Mountain)

Herds: Chinchaga, Columbia North, Kennedy Siding, Moberly, Scott, Narraway, Pink Mountain, Quintette

Program Investment: $836,800

To date, the direct reduction of predator density in caribou habitat has shown to be the most effective management action to effectively halt and reverse the decline of caribou populations in the short term. Over the longer term, effectiveness is improved when it is combined with other management actions, such as habitat protection and restoration. B.C. uses a combination of GPS/VHF tracking collars and aerial shooting to kill wolves. This has been demonstrated to be the most effective and humane method of removing entire wolf packs. The extent and topography of the herd ranges that must be treated necessitates the use of aircraft.

The 180 wolves killed in FY 2018/2019 represent an estimated 1.6-3% of the provincial wolf population but helped to prevent further decline of caribou populations in seven of B.C.'s caribou herds. The total cost of predator direct reduction for the reduction of wolf populations was $824,900 (Table 4).

Herd Name	Wolf Reduction	Cost
Columbia North	13	$76,500
Pink Mountain	99	$231,500
Chinchaga	16	$139,800
Kennedy Siding	11	$80,625
Moberly	12	$80,625
Quintette	18	$80,625
Scott	10	$80,325
Narraway	1	$54,900
TOTAL	**180**	**$824,900**

Columbia North

Wolf removal in the Columbia North herd area[11] was initiated in 2017 as a complimentary management tool to the Revelstoke Maternity Pen Project (described later in this report). Thirteen wolves were removed in FY 2018/2019; five less than in FY 2017/2018. Weather prohibited a population census in that year; however, other evidence to date indicates wolf management is achieving its proximate goal of reducing wolf populations within the herd range. Cow survival is high at 96% and there is slight growth of 2% per year (λ=1.02), contributing to the goal of stabilizing and recovering caribou populations within this and adjacent herds.

Caption: Wolf Capture

Credit: Ministry of Forests, Lands, Natural Resource Operations and Rural Development

11 Predator control for the Columbia North herd area includes all herds in the Shuswap-Columbia (Frisby/Boulder and Columbia South) herd areas

South Peace (Scott, Moberly, Kennedy Siding, Quintette and Narraway herd ranges)

Predator reduction was introduced in the South Peace herd area as a pilot project to assess the effectiveness of wolf reduction in recovering caribou populations. In FY 2018/2019 a total of 51 wolves were removed from the Scott, Moberly, Kennedy Siding and Quintette herd areas at a combined cost of $322,200, reducing the wolf population within the herd areas by approximately 75%. An estimated 18 wolves remain in these ranges. Previous years' removal rates were estimated at 90%, however even at reduced rates of removal, wolf populations are demonstrating the lowest rates of re-colonization since the initiation of the wolf management program in the South Peace herd area in FY 2014/15. One additional wolf was removed in the Narraway herd area. After 80% removal of the population in FY 2017/2018, recolonization rates were low in the Narraway herd with only two other wolves observed, and an additional one to three estimated from tracks in the entire herd boundary.

Five years of data and observation show that reducing wolf populations in caribou habitat results in positive caribou population trends. Prior to the start of wolf control in the area, the focal herds had been declining with populations decreasing by 10-15% per year (**λ= 0.9-0.85**). After five years the population trend in the same herds is now an annual rate of increase of 15% (λ=1.15), with caribou populations increasing from 192 in 2016 to 247 in 2019. A report describing these results is expected in FY 2019/20.

λ = Lambda, called the 'finite population growth rate' that gives the proportional change in population size from one time period to the next. A Lambda less than 1 equates to population decline; greater than 1 indicates a growing population.

Pink Mountain/Chinchaga

This was the first season of active wolf reduction for the Pink Mountain and Chinchaga caribou herd ranges. Chinchaga is the only Boreal Caribou herd with wolf reduction and has historically experienced high rates of wolf predation. Similarly, Pink Mountain is the only Northern Mountain Caribou herd where wolves are being reduced.

Many wolves were removed from the Pink Mountain herd range. This is expected to have a positive impact which will be assessed with population monitoring. In total 99 wolves were removed and an additional six wolves were harvested by local Indigenous Nations trappers. Twenty-four wolves are estimated to remain alive, giving a removal rate of 83%. Of the remaining 24 wolves, 12 are fitted with active GPS/VHF radio collars to facilitate the predator reduction program in 2020. In contrast, wolves were not removed at the desired rate in the Chinchaga herd area. Sixteen wolves were killed and 14 remained by the end of the winter, achieving a removal rate of 53%. Three of the remaining 14 wolves have been fitted with radio collars.

PRIMARY PREY MANAGEMENT

Lead: FLNR – RSD

Partners: not applicable

Herds: Columbia North (including Columbia South, Frisby-Boulder and Central Rockies) and Hart Ranges

Program Investment: primary prey monitoring expenses incurred under monitoring and inventory budget (Goal C)

To date, primary prey management involves increasing opportunities to hunters through the licensed harvest of moose to lower wolf abundance, thus reducing predation pressure on caribou. At this time, primary prey management is only used in conjunction with predator reduction except for study purposes.

In FY 2018/19, the Program continued to study the effects of moose population reduction in two caribou herd ranges: Columbia North, where there was ongoing wolf reduction, and Parsnip (northern Hart Ranges) where there was no wolf reduction. Moose and wolves were collared to support monitoring. Results are expected in March 2020. Expenses for this research were incurred under Goal C: Science.

Apparent Competition: Primary prey are known to impact caribou populations by their effect on apparent competition. Apparent competition is an indirect interaction between two or more prey species through a shared predator, in this case, between caribou and other ungulates (primary prey). Elevated rates of caribou predation due to apparent competition with other ungulate species (primary prey) are identified as a proximate cause of caribou population declines.

POPULATION REDUCTION

Population management actions support caribou to avoid predation and mitigate stresses with the ultimate goal to increase the population size of a herd. The Program undertook four primary population management actions in FY 2018/19 and began planning for a potential new one.

MATERNITY PENNING

Lead: FLNR – Regional Operations

Partners: West Moberly and Saulteau First Nations, Revelstoke Caribou Rearing in the Wild Society (RCRW)

Herds: Klinse-Za (Moberly and Scott herds) and Columbia North

Caribou cows have a low birth rate compared to other ungulates; they typically give birth to only one calf annually. These calves are most vulnerable to predation in their first few weeks of life. Maternity pens are safe enclosures for cows to give birth and for new calves to thrive in the temporary absence of predation pressure. In FY 2018/19, provincial staff supported partners who operate two maternity pens in B.C.: the Klinse-Za Maternity Pen and Revelstoke Maternity Pen. In total, 19 calves were successfully released from maternity pens in B.C. in 2019.

Caption: Cows and newborn calves in Klinse-za Rochfort Maternity Pen

Credit: Line Giguere of Wildlife Infometrics during work undertaken for the Nikanese Wah tzee Stewardship Society

Klinse-Za Maternity Pen

Location: Northeast

Herds: Klinse-Za (Scott and Moberly Herds)

Operator: Nîkanêse Wah tzee Stewardship Society (West Moberly and Saulteau First Nations)

Provincial Investment: $240,000

Operating Life to date: 6 years

The Klinse-Za maternity pen supports recovery of the Klinse-Za herd (also known as the Moberly and Scott herds). In late winter of FY 2017/18, 12 adult female caribou and two calves were captured and transported to the pen. Ten pregnant females gave birth to nine live calves (one stillbirth). Nine calves, two yearlings and 12 adult females were released at the end of July 2018. The pen, in conjunction with ongoing wolf control in the area, has contributed to a positive population trend since 2015 with a population increase of approximately 22% from 2018 to 2019 and a total population count of 81 animals in March 2019.

Revelstoke Maternity Pen

Location: Kootenays

Herds: Columbia North

Operator: Revelstoke Caribou Rearing in the Wild Society (RCRW)

Provincial Investment: $6,700

Operating Life to date: 5 years

Late in March of 2018, the multi-stakeholder non-profit Revelstoke Caribou Rearing in the Wild Society (RCRW) successfully captured 20 cows from the Columbia North herd, 17 of which were confirmed pregnant. Due to concerns with unusually hot spring weather, all animals (17 cows and 11 calves) were released in mid-June, approximately one month earlier than preferred. Conditions in the pen are believed to have contributed to unexpectedly high mortalities, likely a result of the facility's location in a valley bottom. A search for an alternate

in-situ maternity pen site is underway. As of Spring 2019, 9 of 11 calves and 14 of 17 cows were confirmed alive. Survival of pen born calves at approximately ten months of age was 53% versus 36% for wild calves. 2018 was the last year of capture for the project's five-year trial. A final report is expected in 2020.

CONSERVATION BREEDING

Lead: FLNR – Resource Stewardship Division and Regional Operations

Partners: not applicable

Herds: All

Program Investment: $0

The Program formed an internal technical team to explore conservation breeding as a tool to recover at-risk caribou herds in the SMC. Future work will include analysis of applicability, logistical challenges, resource requirements and potential contribution to caribou recovery in B.C.

HARVEST MANAGEMENT

Lead: FLNR – RSD

Partners: not applicable

Herds: SMC Northern: Itcha-Ilgachuz, Chase and Wolverine and all Northern Mountain Caribou

Program Investment: $5,000

Going into FY 2018/19, caribou bulls were legally hunted in some SMC Northern Group Caribou herds in B.C. In March 2019, after extensive consultation with local Indigenous groups, guide outfitters and other key parties, B.C. closed the last remaining hunts of caribou bulls in herds designated as threatened under the federal *Species at Risk Act (SARA)* (the Itcha-Ilgachuz, Chase and Wolverine herds). Although licensed hunting is not the direct cause of decline, B.C. decided that a hunt-closure was warranted.

Staff also concluded a scientific review to determine sustainable harvest rates and minimum population sizes for non-threatened Northern Mountain Caribou herds. The results will inform a consistent management approach for non-threatened caribou herds where hunting continues. The final report is expected in 2020.

TRANSLOCATION

Lead: FLNR - Regional Operations South

Partners: Splatsin First Nation and Revelstoke Caribou Rearing in the Wild Society (RCRW)

Herds: South Selkirk, Purcell South, Columbia North

Program Investment: $128,100

In the winter of 2019, Program staff captured caribou from functionally extirpated herds for release into the local Columbia North herd (South Selkirk herd - one female; Purcell South herd - two females and two males). The translocation of the South Selkirk and Purcell South caribou herds, including penning them with local Columbia North caribou prior to release, served as a successful test of this soft release approach. All animals were cared for and then released from the pen in early spring of 2019 along with a local adult and an orphaned calf to serve as "guides" (See text box, 'Grace'). Animal care was provided by Splatsin First Nation.

Caption: Grace and translocated animals leaving the Revelstoke Maternity Pen

Credit: Len Edwards, Splatsin First Nation

AMAZING GRACE

Shortly after being released from the Revelstoke Maternity Pen in June 2018, a cow was killed by wolves, leaving behind an orphaned female calf just weeks old. Without the ability to nurse, the calf's chance of survival was very slim. Despite all odds, the calf appeared on external game cameras two months later being chased by bears and other predators. The orphan, called "Grace", re-entered the pen and was held alone until January 2019 when caribou from the translocated South Selkirk and Purcell South herds entered the pen. Grace and her pen-mates were released on April 3, 2019.

Caption: Grace meets translocated caribou

Credit: Ministry of Forests, Lands, Natural Resource Operations and Rural Development

SUPPLEMENTAL FEEDING

Lead: FLNR – North Operations

Partners: McLeod Lake Indian Band

Herds: Kennedy Siding

Program Investment: $59,300

A supplemental feeding trial was initiated in 2014 to test whether providing high quality food to free-ranging, wild caribou could improve individual body condition and fitness. The supplemental feeding project was designed and led by Doug Heard, Tithonus Wildlife Research, with support from McLeod Lake Indian Band and FLNR staff. Free-ranging caribou were fed high-quality food pellets from late fall 2018 to early winter 2019. Over the course of 90 days, caribou were provided 7,600 kg of food pellets and consumed an average of 2.3 kg per caribou per day. Pellet consumption constituted a substantial fraction of their nutritional requirements over a three-month period. Trial results are currently being evaluated.

The trial, with the help of remote cameras, scales and other sampling techniques, offers a unique opportunity to acquire detailed population information otherwise unachievable with standard inventory/monitoring techniques. In FY 2018/19, nine motion-sensitive trail cameras captured over 950,000 images; 20% were examined. Based on identification of individuals, primarily on variation in antler structure, staff identified a total of 78 caribou (36 cows, 18 calves and 24 bulls), an increase from 65 caribou (32 cows, 9 calves and 24 bulls) from the previous year. Cow/calf pair matches and other herd demographic information is monitored annually. These enhanced population monitoring techniques have proven invaluable to our understanding of herd dynamics and composition.

Caption: Important data and information gathered through supplemental feeding have helped build support for caribou recovery both locally and more broadly across the province. The Program is currently evaluating this management action's contribution to caribou recovery with initial results expected in 2020.

Credit: Doug Heard, Tithonus Wildlife Research

GOAL B – Community Stability and Partnership

Through collaborative resource stewardship, communicate and engage with citizens of B.C. and develop partnerships that align with the UN Declaration on the Rights of Indigenous Peoples and contribute to community stability

The Province supports partnerships with Indigenous peoples and local communities to play a leadership role in caribou recovery and to create employment in caribou-related stewardship activities. The Program engages with local government, Indigenous communities, industry and stakeholders to understand important knowledge, values and perspectives on caribou and develop partnerships that benefit caribou in B.C.

Program Engagement

Caribou recovery in B.C. is complex and requires the Program involving other governments, stakeholders and interest groups in deliberation, dialogue and action on caribou recovery. In FY 2018/19, the Program prepared for or led engagement processes that covered the extent of all caribou herds in B.C.

Caption: Lone caribou from the Itcha-Ilgachuz herd

Credit: Ministry of Forests, Lands, Natural Resource Operations and Rural Development

CARIBOU RECOVERY PROGRAM DISCUSSION PAPER

Lead: FLNR – Resource Stewardship Division

Partners: None

Herds: All

Program Investment: $65,200

From April 20 to June 15, 2018, the Province requested feedback on the draft *Caribou Recovery Discussion Paper*. The website received over 2,000 views and generated approximately 600 comments, 2,590 emails and 23 stakeholder submissions[12]. The ideas from the paper were also discussed with over 40 stakeholders and at 12 meetings with Indigenous groups. This feedback is informing a high-level *Caribou Recovery Program Plan* that sets priorities and strategic direction for caribou recovery and management in B.C. Once published, it will mark the end of the planning phase for the Program.

12 https://www2.gov.bc.ca/assets/gov/environment/plants-animals-and-ecosystems/wildlife-wildlife-habitat/caribou/public_engagement_what_we_heard_report_october_2018.pdf

DEEP ENGAGEMENT PILOT PROCESS

Lead: FLNR – Regional Operations

Partners: None

Herds: Burnt Pine, Kennedy Siding, Moberly, Narraway, Quintette, Scott, SMC Central Group herds

Program Investment: $10,600

Staff contracted services to pilot a deep engagement structured decision-making process for the SMC Central Group of the South Peace area that would establish a multi-party committee to develop and assess the impacts of various spatial caribou management scenarios across a variety of values. A committee-recommended scenario would form the basis to replace the *Implementation Plan for the Ongoing Management of South Peace Northern Caribou (2013)*. This project was delayed pending finalization of key agreements (described below).

HERD PLANNING

Lead: FLNR –Regional Operations

Program Investment: $215,900

Herd Planning is designed as a two-phase process to develop a document for each herd to inform and guide recovery efforts and support resource allocation decisions across the recovery range.

Phase 1 is the initial gathering and synthesizing of existing herd information (scientific data, threats, past management actions, past recovery efforts and applicable literature) into a single document that will be updated as new data and information becomes available. Phase 2 uses the information gathered in Phase 1 to engage citizens of B.C. on the current state of the herd, limiting factors, possible recovery actions, opportunities and challenges and determine the social and economic considerations for each herd. The results of Phase 2 will be incorporated into decision packages for B.C. and ultimately the herd plans. In FY 2018/19, Program staff undertook herd planning engagement actions in all caribou ecotypes: Northern Mountain, Boreal and SMC.

Information Acquisition and Synthesis – Completed in 2018/19

Partners: *Ducks Unlimited*

Herds: All

Expenditure: $77,000

Completed Phase 1 (information synthesis) for all SMC herd plans. The Program also acquired previously unavailable wetland mapping for Boreal Caribou from Ducks Unlimited and is now examining current habitat conditions and tenures that overlap 21 northwest caribou herd areas.

Southern Mountain Caribou

Partners: Regional District of Bulkley-Nechako

Herds: SMC Northern and SMC Southern herds

Expenditure: $10,500

The Program, in collaboration with the Regional District of Bulkley-Nechako, developed a herd planning engagement process for SMC North and SMC South areas to enable meaningful citizen participation. The Program reached out to local government, industry and local stakeholders to fine tune this process. Most engagement work is expected to be completed by 2023.

Northern Mountain Caribou

Partners: Ta'an Kwäch'än Council, Taku River Tlingit First Nation, Carcross/Tagish First Nation, Teslin Tlingit Council, Kwanlin Dün First Nation, Champagne and Aishihik First Nations, Government of Yukon, Parks Canada

Herds: Carcross, Atlin

Expenditure: $24,200

The Program funded staff participation and engagement with the Southern Lakes Caribou Steering Committee (Steering Committee). The Steering Committee brings together affected Indigenous Nations, Federal, Provincial and Territorial Governments who acknowledge a need and a will to proceed with management planning for caribou in the Yukon Southern Lakes and Atlin, B.C. regions. The collective commitment and common interest of the Steering Committee members is to ensure there are sustainable and enduring populations of caribou in this region that support the affected Indigenous Nations' way of life (Dän k'e/ Kwa day Kwa dun k'e/ Haa Kusteeyí/ A Káa Kududziteeí).

Boreal Caribou

Partners: Fort Nelson First Nation

Herds: Boreal Caribou

Expenditure: $104,200

The *Boreal Caribou Implementation Plan* (2010) was designed to slow the rate of caribou population decline so the necessary research and monitoring could be conducted to determine best options for recovering the species. By the end of fiscal year 2018/19, the technical team, comprised of representatives from FLNR and Fort Nelson First Nation, completed the spatial identification of priority areas for protection based on telemetry, habitat mapping and local and traditional knowledge; developed multiple spatial protection scenarios; identified landscape level priorities for habitat restoration; and completed impact analyses on forestry and oil and gas sectors. The team has also considered applicability of other recovery tools that could be applied to each herd range to provide the greatest opportunity for recovery. The revised *Boreal Caribou Protection and Recovery Plan* was completed and submitted for external technical review.

Partnerships

Lead: FLNR – Resource Stewardship Division

Herds: All

Program Investment: $290,300

In total, Program planning, research and management actions were delivered in collaboration with at least 26 Indigenous groups, 11 non-profits or societies, seven non-Indigenous governments and agencies and eight university and research centres (Appendix 3). Many of these are informal working relationships and others are formal partnerships focused on delivery of a key recovery measure or activity. Several additional strategic or overarching partnerships were planned, designed or ratified over the course of FY 2018/19.

Finalized:

- **A Collaborative Approach Contributing to Southern Mountain Caribou Recovery Planning and Implementation - British Columbia (Contribution Agreement)**: Canada provided the Province with $5.35 million until March 2021 ($2.2 million in FY 2018/19) to support the recovery of SMC herds in B.C. and the implementation of a draft SARA Section 11 Bilateral Conservation Agreement (see "Developing", below).

Developing:

- **Memorandum of Understanding (MOU) with Adjacent Jurisdictions:** The Province collaborated with adjacent jurisdictions to prepare an early draft of an agreement intended to foster stronger, more open communication and improve efficiency of recovery work with government agencies (Government of Northwest Territories, Government of Yukon and Province of Alberta). The Agreement is expected to be finalized in Spring 2020.
- **Tri-lateral Partnership Agreement (Partnership Agreement)**: The Program collaborated with Canada, West Moberly First Nations and Saulteau First Nations to draft an inter-governmental partnership agreement focused on the recovery of the SMC Central Group. This is the first agreement of its kind in Canada, and is intended to set out the actions the four parties will take to stabilize and recover the SMC Central Group. The parties agreed to engage with other Indigenous governments, communities and interested parties on this and the draft SARA Section 11 *Bilateral Conservation Agreement* before they were finalized. The draft Partnership Agreement reflects Canada's willingness to work collaboratively with the Province, Indigenous peoples, local communities and interested stakeholders to develop solutions grounded in the best available information on caribou recovery and which carefully consider the economic context of the necessary recovery measures. Public engagement on the draft Partnership Agreement commenced in April 2019.

- ***SARA* Section 11 Bilateral Conservation Agreement (herein '*s.* 11 Agreement'):** Under *SARA,* section 11, Canada can form agreements that include conservation measures that benefit species at risk and consider other community interests. In 2017, the Province and Canada developed a draft s.11 agreement for the SMC Central Group and shared it with Indigenous Nations and stakeholder groups. This engagement highlighted the need to expand the scope of the agreement to cover all SMC groups in B.C. A revised agreement was drafted in FY 2018/19 to include commitments, measures and strategies for the recovery of all SMC groups. The draft s.11 agreement establishes a framework for co-operation between Canada and the Province to work collaboratively with Indigenous Nations, local governments, industry and communities to develop caribou management plans for SMC. Engagement on the draft s.11 agreement commenced in April 2019 in concurrence with the draft Partnership Agreement.
- **Stakeholder Governance:** The Program prepared draft terms of reference to establish a provincial board of stakeholders. Work will continue next fiscal year to consider membership and formally establish the board.
- **Memorandum of Understanding (MOU) with Petroleum and Natural Gas Sector:** Program staff collaborated with their colleagues from the Ministry of Energy, Mines and Petroleum Resources to draft an MOU with the petroleum and natural gas sector that is expected to be formalized in the coming fiscal year. The focus is on restoration of petroleum and natural gas affected ecosystems across Northeast B.C., the benefits of which are expected to extend to caribou.

Indigenous and Crown Relations

Lead: FLNR – Resource Stewardship Division with Regional Operations

Herds: All

Program Expenditure: $309,400

Indigenous engagement and partnership are fundamental components of the Program. Every B.C. Cabinet Minister's mandate letter includes commitments to move forward on the *Truth and Reconciliation Commission of Canada's* Calls to Action and review policies, programs, and legislation to find ways to bring the principles of the *United Declaration on the Rights of Indigenous Peoples* into action, which could include exploring changes to legislation and/or policy.

Indigenous Engagement

Provincial Engagement on the Caribou Recovery Program (Phase 1 engagement)

The Program invested $150,000 to host a series of Indigenous-Crown engagement sessions in Richmond, Chilliwack, Kamloops, Kelowna, Cranbrook, Williams Lake, Prince George, Burns Lake, Terrace, Fort St. John, Fort Nelson and Watson Lake. Representatives from 122 Indigenous communities and organizations participated in these sessions from June to August 2018. The scope of engagement covered how Indigenous Nations would be participants in its delivery of four key government initiatives, one of which was the Program. The resulting 'What We Heard' document is informing Program work and investment in key initiatives, such as caribou recovery herd planning, and the Guardian Program[13] which empowers communities to manage ancestral lands according to traditional laws and values. Phase 2 engagement was superseded by provincial engagement on the draft Partnership and Section 11 agreements.

Engagement and Partnership with Treaty 8 Nations on Boreal Caribou

B.C. and Fort Nelson First Nation advanced collaboration on key elements of Boreal Caribou herd planning (see Herd Planning) and in March 2019, the Province initiated engagement with the Doig River First Nation on the *Chinchaga Range Plan*. The Province also entered initial engagement discussions with other First Nations including Prophet River First Nation, Blueberry River First Nations and Dene Tha' First Nation to support Chinchaga range planning and implementation.

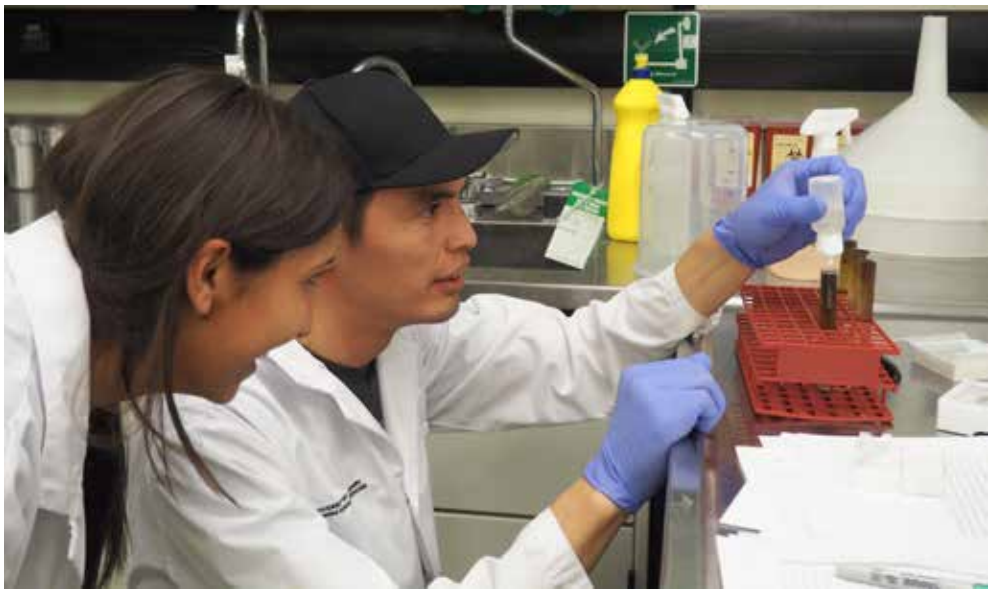
Partnership

Through provincial engagement, Indigenous Nations expressed interest in partnering with the Province to deliver management actions such as habitat restoration, caribou/predator collaring (radio telemetry), predator reduction and maternal penning management actions and to develop herd plans. When and where mutual interest exists, the Program is finding opportunities to collaborate and partner with Indigenous Nations. For example, it supported the West Moberly First Nations' and Saulteau First Nations' application for funding through HCTF to complete restoration activities in the SMC Central Group herd ranges and other management actions described under Goal A (e.g., maternity penning and supplemental feeding).

13 https://www.ilinationhood.ca/guardians

Caption: *Dr. Naima Jutha* and Jarett Quock (Tahltan Central Government Wildlife Guardian) at a Community Based Wildlife Health Surveillance Workshop

Credit: *Dr. Naima Jutha, University of Guelph*



Indigenous Knowledge

One of the themes that arose though provincial engagement was traditional or Indigenous Knowledge (IK). IK is often endemic to a traditional territory, a particular herd of caribou or a particular watershed. IK provides insight into past form and function of the area and the animals it supported and provides a north star to guide meaningful future recovery efforts.

During engagement, Indigenous participants consistently stated their desire to have IK integrated in all aspects of caribou recovery. B.C. shares this interest and is striving to incorporate IK in a way that is respectful to both the knowledge and the knowledge holders. As such, there will be a focus in herd planning as the appropriate level for collaborating on the incorporation of IK in caribou recovery.

GOAL C – Knowledge Development and Dissemination

Build and communicate the best-available science and knowledge to inform caribou recovery initiatives and resource stewardship

Goal C is focused on collecting, managing and communicating our information on caribou to support policy development and all levels of decision making.

SCIENCE

Lead: ENV – Environmental Sustainability and Strategic Policy Division

Partners: University of Northern British Columbia, Bulkley Valley Research Centre

Herds: All herds with special projects in Hart Ranges, Itcha-Igatchuz and Tweedsmuir and SMC Northern Group and Northern Mountain Caribou

Program Investment: $68,000

The Program established the B.C. Caribou Science Team (Science Team) as a forum for regional and provincial caribou experts to share knowledge and improve understanding on key scientific issues in support of the recovery and maintenance of caribou and their habitat

in B.C. The team met monthly to discuss issues such as immediate measures required to support caribou, caribou health, inventory and monitoring priorities, adaptive management and predator reduction.

The Science Team developed a consistent, repeatable and science-based provincial status and risk assessment approach to assessing the current status and conservation risk faced by B.C.'s caribou subpopulations. The results supported the prioritization of provincial planning and monitoring efforts.

Working in partnership with the University of Northern British Columbia and the Bulkley Valley Research Centre, project work continued for the multi-year evaluation of how projected changes in the composition and structure of forest stands in north central B.C. will influence the distribution and quality of northern caribou forest habitat. This project is due to be completed in 2020.

A facilitated workshop was held to develop adaptive management plans for three herds: Hart Ranges, Itcha-Ilgatchuz, and Tweedsmuir. Draft plans were completed and are scheduled to be finalized in late 2019. These adaptive management plans are expected to provide a well-developed and accepted process for structuring management programs and using outcomes to improve future management.

Improvements were made to mapping of core and matrix habitat for most of the herds in the SMC. Work continues to revise, improve and make this information available.

CARIBOU HEALTH

Lead: FLNR – Resource Stewardship Division with Regional Operations

Partners: Tahltan Band Council, Tahltan Guide and Outfitter Association, Dease Lake, Environment and Climate Change Canada, Parks Canada and the Universities of Alberta, California at Davis, Calgary, Guelph, Massachusetts and Saskatchewan

Herds: All

Program Investment: $199,500

The Caribou Herd Health Project (Project) standardizes live and dead caribou sample collection methods and analysis to improve our understanding of caribou herd health. Project staff are building a baseline to allow comparisons of data on caribou genetics, stress, nutrition and pathogens. Currently, the primary focus of the Project is identifying and managing disease which can be used to understand how human disturbance and climate change affect caribou populations.

To ensure that herd health data is consistent, standardized and relevant, all systems within the Project are structured around standardized protocols – from the regional operations field staff who gather samples and data to the lab technicians and veterinarians who process them and enter results into the provincial health database. Between December 2017 and March 2019, the Project collected samples using 523 field kits. Funding supported two staff members, supplies, shipping and analyses as well as a draft herd health assessment report.

As trends are revealed over the next few years, the Project will develop individual Herd Health Profiles for each herd sampled as part of the Program's commitment to adaptive management. The Herd Health Profiles will be updated as new information becomes available to ensure that our developing understanding of caribou health can be applied to management decisions that affect caribou. This holistic assessment of herd health is providing a uniform health baseline where none existed before.

The Project is interested in collaborating with Indigenous groups, researchers and other partners to further evaluate health determinants and indicators of genetic, nutritional, pathogenic and stress conditions for B.C. herds and broader based assessments of resiliency and sustainability.

The BC Wildlife Health Program partnered with the Tahltan Guide and Outfitter Association, the Tahltan Central Government, the community of Dease Lake, as well as a number of independent funding organizations on an innovative project. Those partners and Dr. Naima Jutha, a graduate student with the Universities of Calgary and Guelph, developed a multidisciplinary approach to Northern Mountain Caribou health assessment and monitoring in northwestern B.C. The study uses harvest-based sampling and local ecological knowledge from outfitters, guides and Indigenous hunters to assess the overall health, status and trends of caribou populations in one of the most remote regions of our province. Dr. Jutha's goal is to build a model for Indigenous and local communities to assess caribou health that can be extended to other wildlife species using methods that are applicable across B.C. This model is to be completed in September 2020.

Caption and credit:
Dr. Naima Jutha, University of Guelph

INFORMATION SUPPORT TOOLS

Caribou Land Use Simulator

Lead: FLNR – Office of the Chief Forester

Partners: None

Herds: All

Program Investment: $25,000

The Program funded creation of the Caribou Land Use Simulator (CLUS). CLUS is an integrated timber harvest and caribou modeling tool designed to facilitate collaborative discussions related to caribou recovery and forestry in B.C. CLUS considers important elements such as habitat condition, climate change and species interaction. Using this tool, staff can weigh the consequences of proposed caribou recovery actions on timber harvesting objectives and caribou habitat and populations. The model will be actively used to support decisions in the coming fiscal year.

Caribou Decision Support Tool

Lead: ENV – Environmental Sustainability and Strategic Policy Division

Partners: None

Herds: All

Program Investment: $1,000

The Program finalized a draft version of a provincial-scale Decision Support Tool (DST). The DST is an analytical tool intended to assist senior provincial managers in making strategic resource allocation decisions regarding caribou by providing objective, transparent and repeatable trade-off evaluations. The tool is accompanied by a report that documents the development of the DST and describes its structure and contents.

POPULATION MONITORING

Lead: FLNR – Regional Operations

Partners: Fish and Wildlife Compensation Program, Lheidli T'enneh First Nation, Government of Alberta, Tŝilhqot'in National Government (TNG), Tsay Keh Dene Nation, Nak'azdli Whut'en, Kwadacha Nation, Taku River Tlingit First Nation, Carcross/Tagish First Nation, Government of Yukon

Herds: 31 (see Appendix 2)

Program Investment: $2,013,500

With the creation of the Program in 2017, B.C. recognized the need for improved population information to support planning and decision making. Most surveys occur in winter when snow conditions are conducive to spotting tracks from helicopters. To enable tracking and monitoring, the Program supports the purchase of collars, associated data fees and cost of capture to place collars on individual caribou, moose and wolves. The collars also provide notification of mortalities, allowing immediate investigation by biologists to determine the cause.

In FY 2018/19, the Program led 101 distinct monitoring and inventory activities in 31 herds. The Program deployed 212 collars in 17 herds, completed 32 caribou surveys (population estimate, calf recruitment and habitat identification) and investigated 40 caribou mortalities. Staff also deployed 60 wolf collars, obtained 16 wolf population estimates and 5 primary prey population estimates (moose and horse). (See details within Appendix 2).

Efforts to improve the cost effectiveness and efficiency of monitoring work included studying the use of remote cameras to monitor caribou and predator occupancy in calving areas, and GPS collar data to measure caribou use in modified harvest areas (Itcha-Ilgachuz).

Caption: Caribou capture to secure tracking collars - Itcha-Ilgachuz herd

Credit: Ministry of Forests, Lands, Natural Resource Operations and Rural Development

KNOWLEDGE MANAGEMENT

Lead: ENV – Environmental Sustainability and Strategic Policy Division, Knowledge Management Branch

Partners: None

Herds: All

Program Investment: $243,900

In FY 2018/19, the Program continued to fund storage, organization and management of caribou related data. This included ongoing efforts to capture, review and clean regional data, specifically capturing all historical data associated with the Boreal Caribou, SMC and some of the Northern groups. Staff initiated corporate database enhancements to accommodate new and existing data, including a multi-year contract to transfer existing caribou telemetry data into government data systems. Significant resources were also invested to support the coordination and consolidation of critical habitat mapping for the Southern, Central and a portion of the Northern groups. In FY 2018/19 the Program developed the first phase of an online, freely accessible caribou web mapping tool, focused on continually improving access to the most current caribou data and related information.

In the coming fiscal year, staff are focusing on provincial data capture efforts, and implementing a new telemetry data management system.

GOAL D – Program Management

Lead the delivery of the provincial program with integrity and innovation

Under Goal D, staff centrally manage systems and processes to help coordinate and maintain consistency and accountability across all government agencies working on caribou and to help the Program communicate with our external partners.

Lead: FLNR – Resource Stewardship Division

Partners: None

Herds: All

Program Investment: $2,806,000

In FY 2018/19 Program management staff designed, implemented and managed systems and processes to support coordinated decision making and Program delivery. This included establishing a central governance framework and supporting groups to operate and make strategic decisions for the Program. Staff also orchestrated preliminary efforts to develop the Program's Strategic Framework; streamline and unify Program work planning, budgeting and performance reporting systems; and other efforts to help staff in eleven divisions, agencies and administrative regions across the province demonstrate leadership in their field. Program management staff also supported staff in reaching out to Indigenous, stakeholder and industry groups on Program Update calls and other engagement projects.

In the coming fiscal year, staff will continue to develop systems and help confirm the strategic direction for the Program as it transitions from the Planning to the Implementation Phase.

Conclusion

As the Program prepares for progress from the Planning to the Implementation Phase, effort will be expended in answering some key questions, such as:

- What are our priorities and objectives toward recovery?
- How will we prioritize our investment in recovery?
- What management actions will most effectively help us meet our objectives and priorities?

To help answer these key questions, the Program is continuously improving how it manages information and addresses key information gaps. We are striving to improve our mutual understanding and priorities by meaningfully engaging Indigenous communities, local government, industry and stakeholders. We hope to realize the benefits of partnerships with others invested culturally, economically and ethically in the recovery of caribou in B.C. Through a deep understanding of caribou knowledge (science, local knowledge, Indigenous knowledge) and a commitment to better understand the concerns raised by other invested parties, we will be poised to answer recovery questions with integrity and, when new information and input dictate, adjust our approach to the benefit of caribou and the citizens of B.C.

Credit: Christine Friedrichsmeier, Ministry of Forests, Lands, Natural Resource Operations and Rural Development

APPENDIX 1: Management Actions and Planning Activities by Herd

ACTIVITY/Herd	Incremental Habitat Protection Measures[15]	COS Patrols of Closed Areas	Habitat Restoration	Predator Reduction	Primary Prey Management	Maternity Pen	Translocation	Supplemental Feeding
Southern Mountain NEA Southern Group								
South Selkirks (Extirpated 18/19)	n	y	n	n	n	n	y	n
Purcells South (Extirpated 18/19)	n	y	n	n	n	n	y	n
Purcells Central (Extirpated)	n	n	n	n	n	n	n	n
Central Selkirks (Nakusp and Duncan)	n	n	n	n	n	n	n	n
Monashee (Extirpated)	n	n	n	n	n	n	n	n
Central Rockies (Extirpated)	n	n	n	n	n	n	n	n
Columbia South	n	y	n	y	y	n	n	n
Frisby-Boulder	n	y	n	y	y	n	n	n
Columbia North	n	y	y	y[14]	y	y	n	n
Groundhog	n	y	n	n	n	n	n	n
Wells Gray North	n	y	n	n	n	n	n	n
Wells Gray South	n	y	n	n	n	n	n	n
Barkerville	n	y	n	n	n	n	n	n
North Cariboo	n	y	n	n	n	n	n	n
Narrow Lake	n	n	n	n	n	n	n	n
George Mountain (Extirpated)	n	n	n	n	n	n	n	n
Hart Ranges	n	y	n	n	y	n	n	n
Red Rock Prairie Creek	n	n	n	n	n	n	n	n
Southern Mountain NEA Central Group								
Narraway	n	y	n	y	n	n	n	n
Quintette	n	y	y	y	n	n	n	n
Kennedy Siding	n	y	n	y	n	n	n	y
Burnt Pine (EX.)	n	n	n	n	n	n	n	n
Moberly (Klinse-Za)	n	n	n	y	n	y	n	n
Scott (Klinse-Za)	n	n	n	y	n	y	n	n

14 This is monitoring and refinement work and is incremental to existing habitat protection which exists, to some degree in all herd areas except Monashee, Central Rockies and George Mountain.

ACTIVITY/Herd	Incremental Habitat Protection Measures	COS Patrols of Closed Areas	Habitat Restoration	Predator Reduction	Primary Prey Management	Maternity Pen	Translocation	Supplemental Feeding
Boreal								
Chinchaga	n	n	n	y	n	n	n	n
Snake-Sahtahneh	n	n	y[15]	n	n	n	n	n
Westside (formally Prophet and Parker)	n	n	n	n	n	n	n	n
Maxhamish	n	n	n	n	n	n	n	n
Calendar	n	n	n	n	n	n	n	n
Southern Mountain NEA Northern Group								
Graham	n	n	n	n	n	n	n	n
Itcha-Ilgachuz	n	y	n	n	n	n	n	n
Charlotte Alplands	n	n	n	n	n	n	n	n
Rainbows	n	n	n	n	n	n	n	n
Tweedsmuir - Entiako	y	n	y	n	n	n	n	n
Telkwa	n	y	y	n	n	n	n	n
Takla	y	n	n	n	n	n	n	n
Wolverine	y	n	n	n	n	n	n	n
Chase	y	n	y[16]	n	n	n	n	n
Northern Mountain NEA								
Thutade	n	n	n	n	n	n	n	n
Finlay	n	n	n	n	n	n	n	n
Pink Mountain	n	n	n	y	n	n	n	n
Muskwa	n	n	n	n	n	n	n	n
Gataga	n	n	n	n	n	n	n	n
Frog	n	n	n	n	n	n	n	n
Rabbit	n	n	n	n	n	n	n	n
Liard Plateau	n	n	n	n	n	n	n	n
Horseranch	n	n	n	n	n	n	n	n
Little Rancheria	n	n	n	n	n	n	n	n
Swan Lake	n	n	n	n	n	n	n	n
Level Kawdy	n	n	n	n	n	n	n	n
Atlin	n	n	n	n	n	n	n	n
Carcross	n	n	n	n	n	n	n	n
Tsenaglode	n	n	n	n	n	n	n	n
Edziza	n	n	n	n	n	n	n	n
Spatsizi	n	n	n	n	n	n	n	n

15 Predator reduction in Columbia North provides benefit to Frisby/Boulder and Columbia South Herds.

16 Program staff provided preliminary planning support for restoration work in the Snake-Sahtahneh and Chase herds.

APPENDIX 2: Monitoring and Inventory Activity by Caribou Herd and Herd Group

Herd and Group	Number of Collars Deployed	Telemetry flights	Recruitment/Calf Survey	Population Estimate Survey	Mortality Investigations	Habitat Identification Survey	Wolf Collar Deployment	Wolf Population Estimate	Primary Prey Monitoring	# Activity Types / Herd Group	# Monitoring Activities / Herd
Southern Mountain NEA Southern Group	**53**	**4**	**2**	**5**	**9**	**0**	**11**	**7**	**3**	**8**	
South Selkirks (Extirpated 18/19)	3	0	0	0	0	0	0	0	0		1
Purcells South (Extirpated 18/19)	4	0	0	1	0	0	0	0	0		2
Purcells Central (Extirpated)	0	0	0	0	0	0	0	0	0		0
Central Selkirks (Nakusp and Duncan)	0	0	0	1	1	0	0	1	0		3
Monashee (Extirpated)	0	0	0	0	0	0	0	0	0		0
Central Rockies (Extirpated)	0	0	0	0	0	0	0	0	0		0
Columbia South	0	0	0	0	0	0	0	1	1		2
Frisby-Boulder	0	0	0	0	0	0	0	1	1		2
Columbia North	32	2	1	0	0	0	0	1	1		5
Groundhog	0	1	0	1	1	0	4	1	0		5
Wells Gray North	0	0	0	0	0	0	0	0	0		0
Wells Gray South	0	0	0	1	0	0	0	1	0		2
Barkerville	0	0	0	0	0	0	0	0	0		0
North Cariboo	2	0	0	0	0	0	0	0	0		1
Narrow Lake	0	0	0	0	0	0	0	0	0		0
George Mountain	0	0	0	0	0	0	0	0	0		0
Hart Ranges	12	1	1	1	7	0	7	1	0		7
Red Rock Prairie Creek	0	0	0	0	0	0	0	0	0		0
Southern Mountain NEA Central Group	**29**	**0**	**3**	**1**	**6**	**0**	**12**	**5**	**0**	**6**	
Narraway	0	0	0	0	0	0	0	0	0		0
Quintette	6	0	0	1	1	0	0	1	0		4
Kennedy Siding	5	0	1	0	1	0	0	1	0		4
Burnt Pine (EX.)	0	0	0	0	0	0	0	1	0		1
Moberly (Klinse-Za)	18	0	1	0	4	0	12	1	0		5
Scott (Klinse-Za)	0	0	1	0	0	0	0	1	0		2
Boreal	**39**	**0**	**5**	**0**	**2**	**0**	**5**	**1**	**0**	**5**	
Chinchaga	11	0	1	0	1	0	5	1	0		5
Snake-Sahtahneh	14	0	1	0	0	0	0	0	0		2
Westside (formally Prophet and Parker)	4	0	1	0	0	0	0	0	0		2
Maxhamish	6	0	1	0	0	0	0	0	0		2
Calendar	4	0	1	0	1	0	0	0	0		3

Herd and Group	Number of Collars Deployed	Telemetry flights	Recruitment/Calf Survey	Population Estimate Survey	Mortality Investigations	Habitat Identification Survey	Wolf Collar Deployment	Wolf Population Estimate	Primary Prey Monitoring	# Activity Types / Herd Group	# Monitoring Activities / Herd
Southern Mountain NEA Northern Group	**50**	**4**	**7**	**5**	**20**	**1**	**27**	**2**	**2**	**9**	
Graham	7	3	1	0	1	0	0	0	0		4
Itcha-Ilgachuz	15	1	0	1	10	0	20	1	2		7
Charlotte Alplands	0	0	0	0	0	0	0	0	0		0
Rainbows	0	0	0	0	0	0	0	0	0		0
Tweedsmuir - Entiako	9	0	1	1	1	1	7	0	0		6
Telkwa	3	0	1	1	0	0	0	0	0		3
Takla	0	0	0	0	0	0	0	0	0		0
Wolverine	0	0	2	1	3	0	0	1	0		4
Chase	16	0	2	1	5	0	0	0	0		4
Northern Mountain NEA	**41**	**2**	**1**	**2**	**3**	**0**	**5**	**1**	**0**	**7**	
Thutade	0	0	0	0	0	0	0	0	0		0
Finlay	0	0	0	1	0	0	0	0	0		1
Pink Mountain	13	1	0	0	0	0	5	1	0		4
Muskwa	15	0	0	0	1	0	0	0	0		2
Gataga	0	0	0	0	0	0	0	0	0		0
Frog	0	0	0	0	0	0	0	0	0		0
Rabbit	0	0	0	0	0	0	0	0	0		0
Liard Plateau	0	0	0	0	0	0	0	0	0		0
Horseranch	0	0	0	0	0	0	0	0	0		0
Little Rancheria	0	0	0	0	0	0	0	0	0		0
Swan Lake	0	0	0	0	0	0	0	0	0		0
Level Kawdy	0	0	0	0	0	0	0	0	0		0
Atlin	3	1	1	1	2	0	0	0	0		5
Carcross	10	0	0	0	0	0	0	0	0		1
Tsenaglode	0	0	0	0	0	0	0	0	0		0
Edziza	0	0	0	0	0	0	0	0	0		0
Spatsizi	0	0	0	0	0	0	0	0	0		0
Total	212	10	18	13	40	1	60	16	5		**101**

APPENDIX 3: Partners and Collaborators in 2018/19

The Program would like to thank the numerous Indigenous nations and groups, other governments, stakeholders, universities and research centres who collaborated in some capacity on Program projects and activities in 2018/19 (mentioned within this report and listed below). Not recognized here are the additional Indigenous, stakeholder and industry representatives who took the time to participate in our engagement activities – whether during face-to-face engagement or on our regular program update calls. Our sincerest apologies if we inadvertently overlooked any group or individual.

Indigenous Nations and Groups

Blueberry River First Nations
Carcross/Tagish First Nation
Champagne and Aishihik First Nations
Cheslatta Carrier Nation
Dene Tha' First Nation
Doig River First Nation
Fort Nelson First Nation
Kwadacha Nation
Kwanlin Dün First Nation
Lheidli T'enneh First Nation
McLeod Lake Indian Band
Nak'azdli Whut'en
Nee-Tahi-Buhn Band
Nîkanêse Wah tzee Stewardship Society
Office of the Wet'suwet'en Nation
Okanagan Nation Alliance
Skin Tyee Band
Saulteau First Nations
Southern Dakelh Nation Alliance
Splatsin First Nation and Yucwmenlucwu LLP
Ta'an Kwäch'än Council
Tahltan Band Council
Taku River Tlingit First Nation
Teslin Tlingit Council
Tsay Keh Dene Nation
Tŝilhqot'in National Government
West Moberly First Nations

Stakeholder Groups

B.C. Snowmobile Federation and member clubs
Ducks Unlimited
Fish and Wildlife Compensation Program
Forest Enhancement Society
Fraser Basin Council
Habitat Conservation Trust Foundation
HeliCat Canada
Revelstoke Caribou Rearing in the Wild Society
Professional Forestry Forum - Industry Members
Society of Ecological Restoration in Northern B.C.
Tahltan Guide and Outfitter Association

Universities and Research Centres

Bulkley Valley Research Centre
University of Calgary
University of Saskatchewan
University of Alberta
University of California at Davis
University of Guelph
University of Massachusetts
University of Northern British Columbia

Other Governments

Dease Lake
Government of Alberta
Government of Canada: Environment and Climate Change Canada (ECCC), Parks Canada and Royal Canadian Mounted Police
Government of Northwest Territories
Government of Yukon
Professional Forestry Forum - Resource District Members
Regional District of Bulkley-Nechako