

Saskatoon Nature Society
December 9, 2021



Woodland Caribou in Saskatchewan

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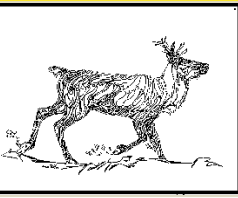
Michael McLaughlan, R.P.F.
Ministry of Environment
Fish, Wildlife & Lands

*Special Acknowledgment to:

Mr. Tim Trottier
Caribou Biologist
Ministry of Environment (ret'd)

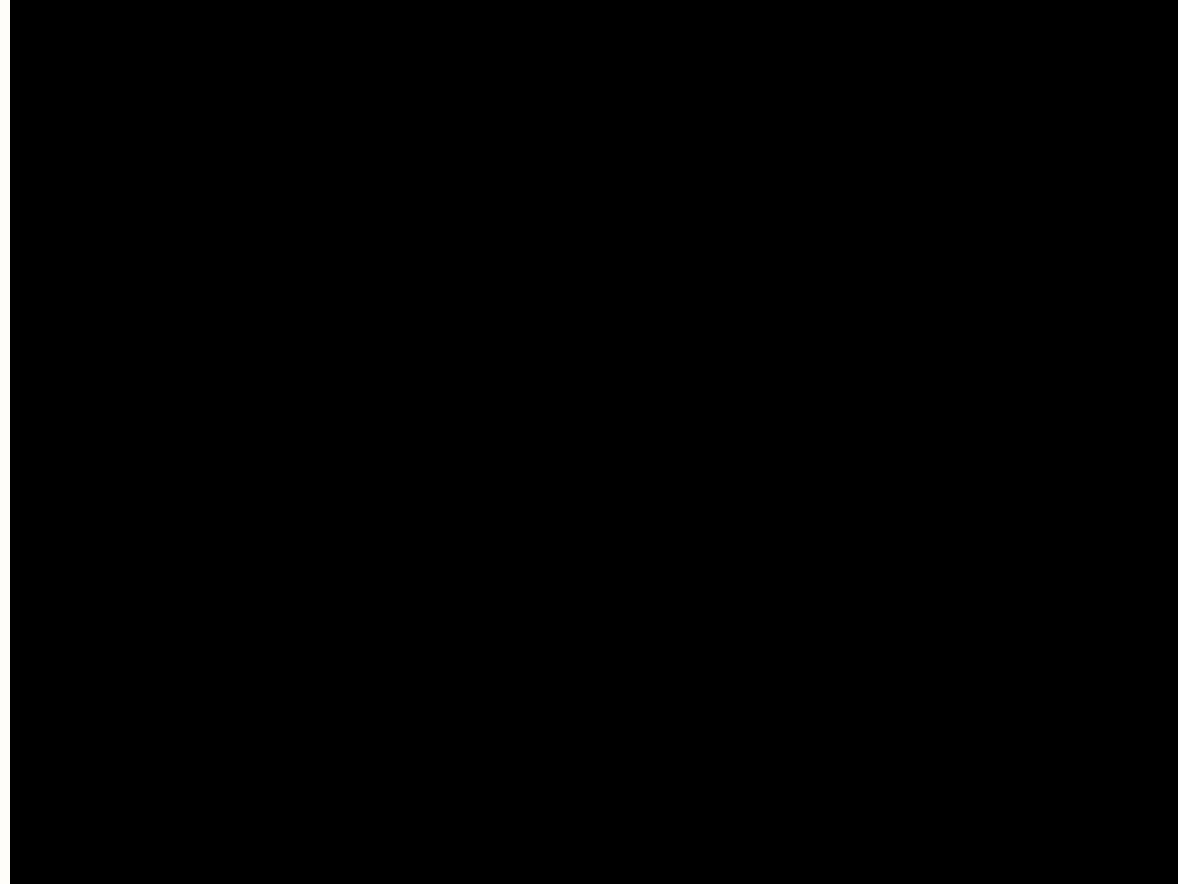
Dr. Phil McLoughlin, et al.,
Associate Professor
University of Saskatchewan

Saskatchewan!

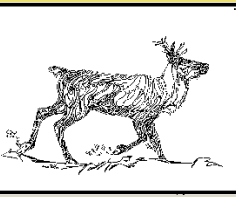


Hinterland
Who's Who

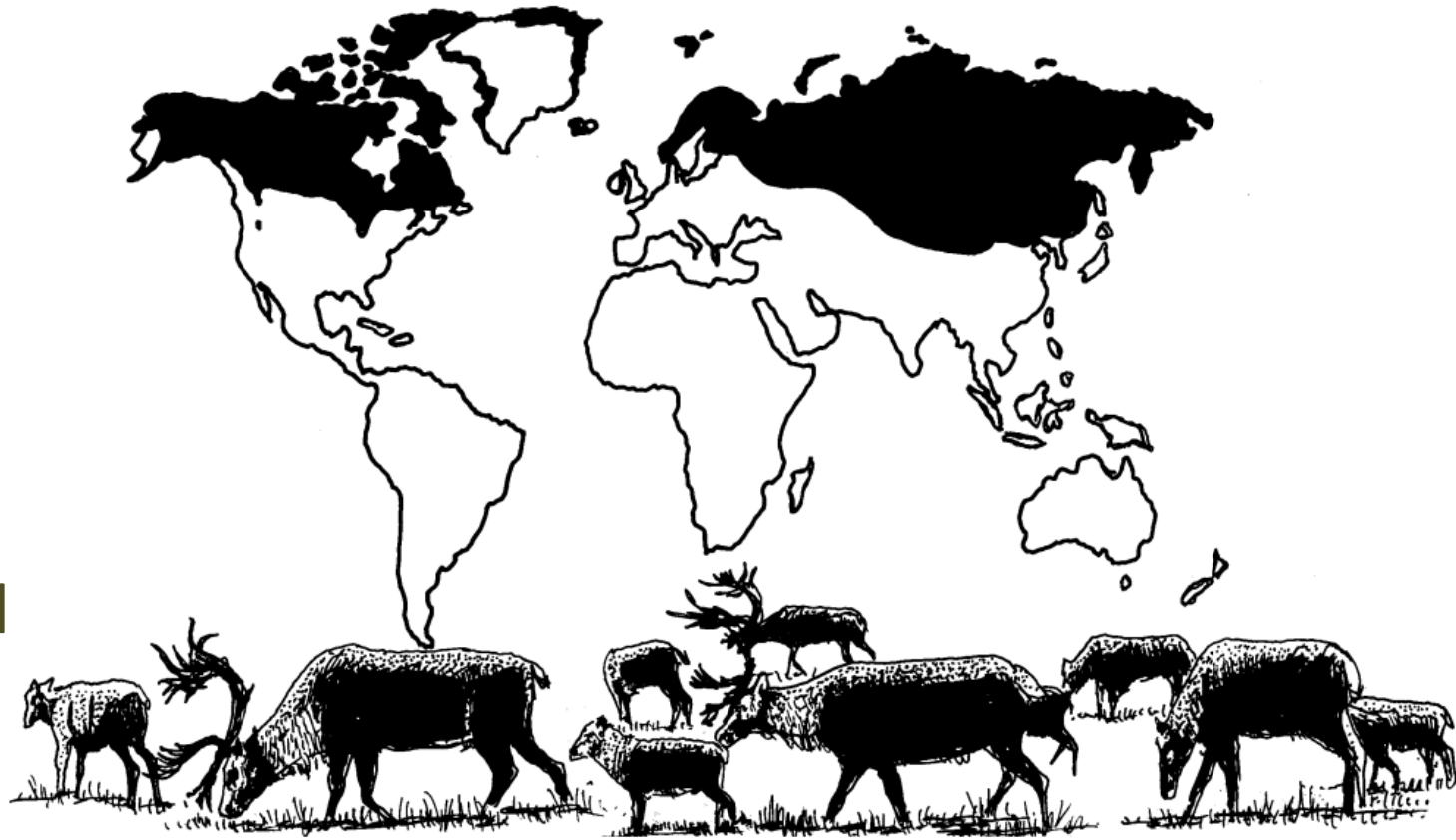
The
Woodland
Caribou



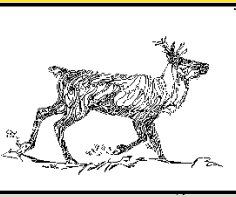
Caribou vs Reindeer



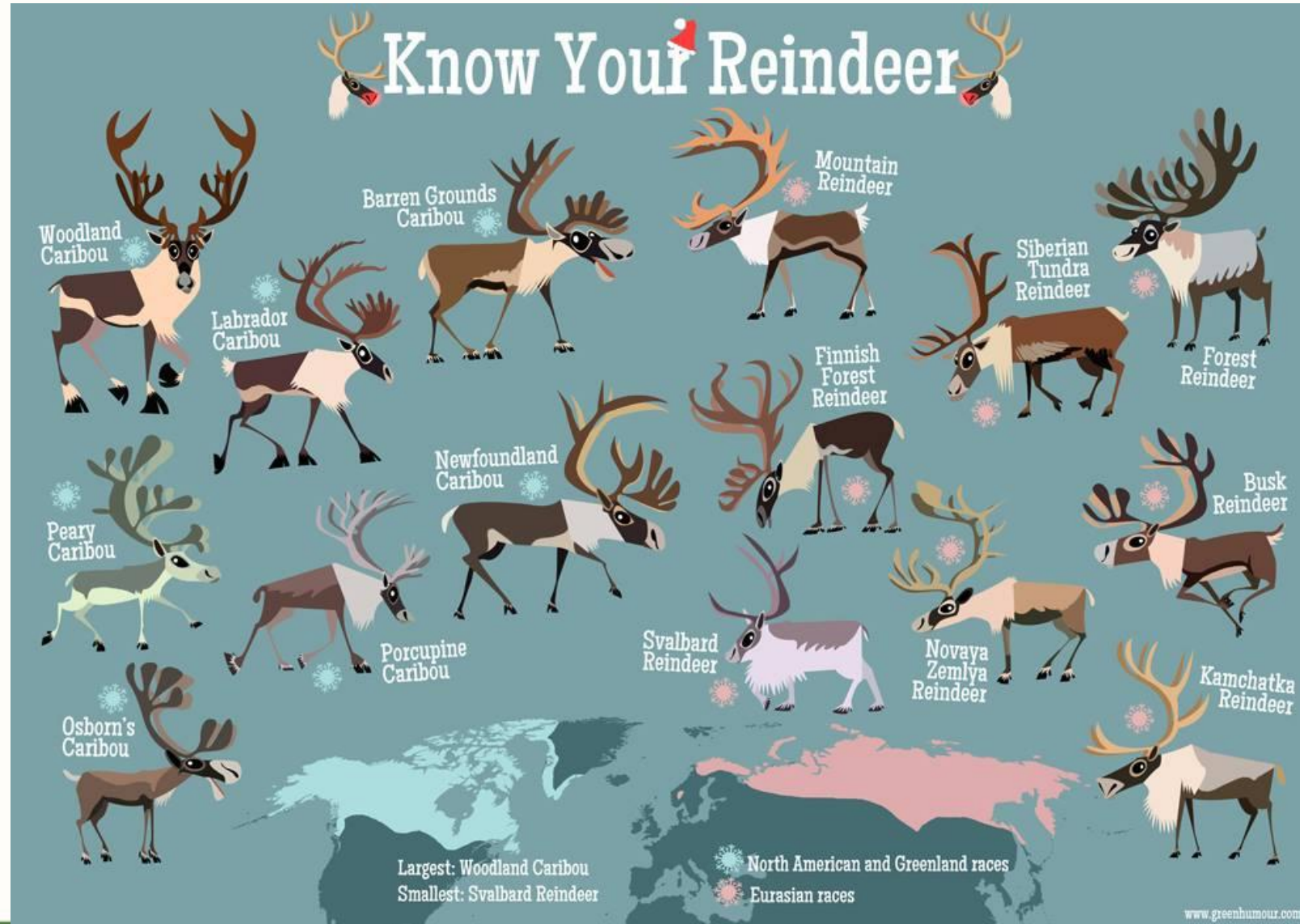
- Caribou and reindeer are both members of a single species:
 - *Rangifer tarandus*
 - Numerous subspecies exist.
- There are differences due to geography, habitat, habit, and other features.
- In short: reindeer live in northern Europe and Asia and caribou live in North America.



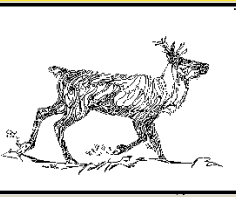
Caribou vs Reindeer



- Although there is considerable variation in phenotypic traits in the species (e.g., body size, coat colouration, morphology), caribou and reindeer are able to interbreed and produce fertile, viable offspring.



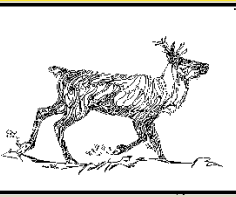
Reindeer



- “Reindeer” refers to the domesticated, semi-domesticated or wild subspecies found in Eurasia (Northern Europe and Asia).
- Reindeer also occur in North America, particularly Newfoundland, and as early as 1892 in Alaska, as a result of human introductions.



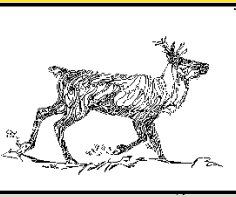
North American Caribou



- The word “caribou” comes from French explorers of eastern North America who derived it from the Micmac term ‘xalibu’, meaning the “one who paws.”
- This is a reference to the caribou's wide hooves, which make it easier to dig and walk in deep snow.

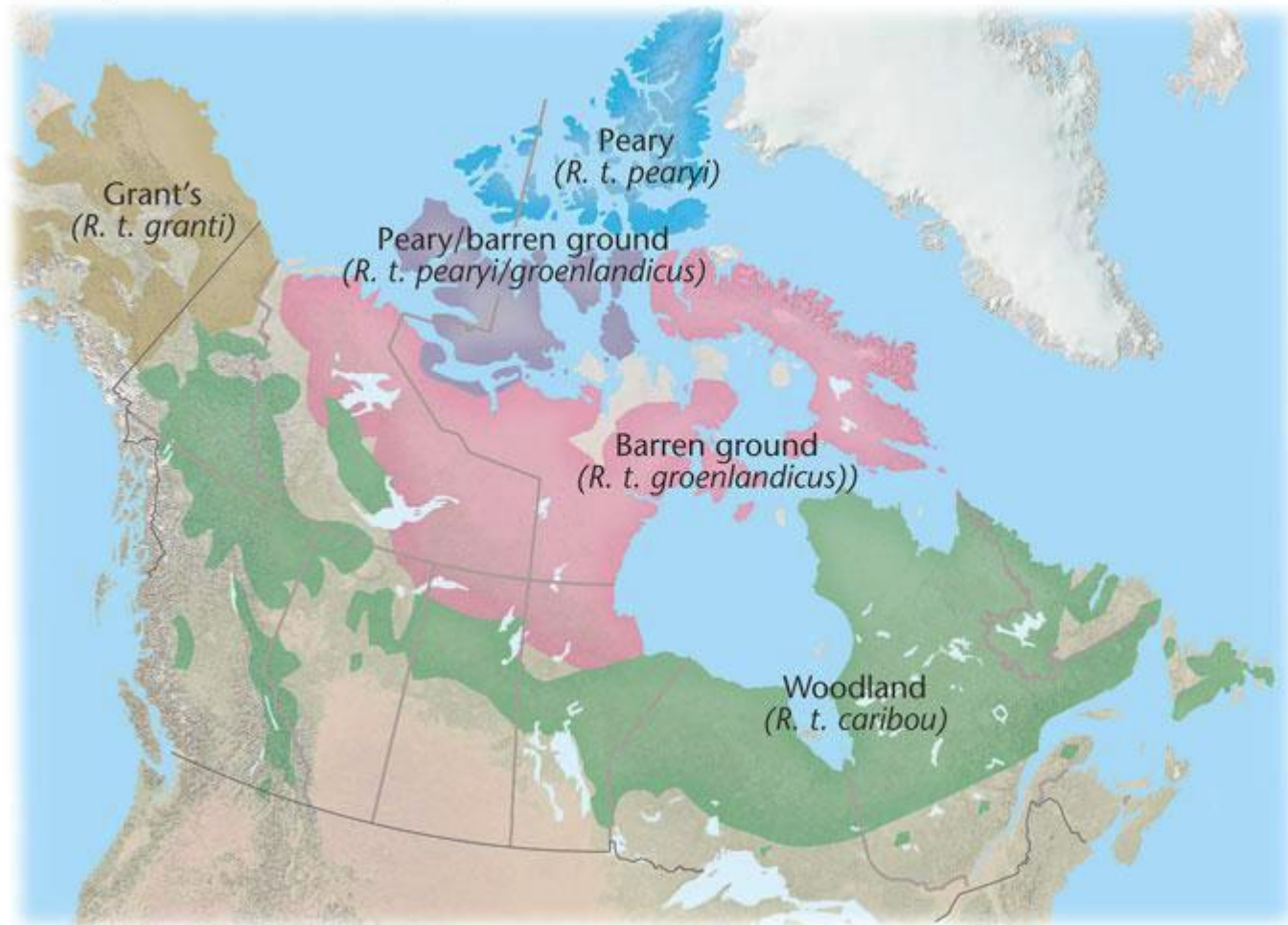


Canadian Caribou (sub-species)

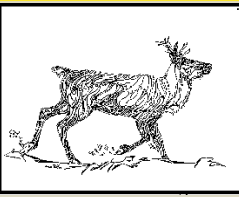


- There are four existing subspecies of caribou in Canada including the:
 - **Peary Caribou**
 - (*Rangifer tarandus pearyi*),
 - **Barren-ground Caribou**
 - (*R. t. groenlandicus*),
 - **Grant's Caribou** (*R. t. granti*), and
 - **Woodland Caribou** (*R. t. caribou*).
- A fifth subspecies, the **Dawson's Caribou** (*R. t. dawsoni*), which occurred in Haida Gwaii (*i.e.*, Queen Charlotte Islands, BC) is extinct.

Subspecies of caribou (*Rangifer tarandus*)

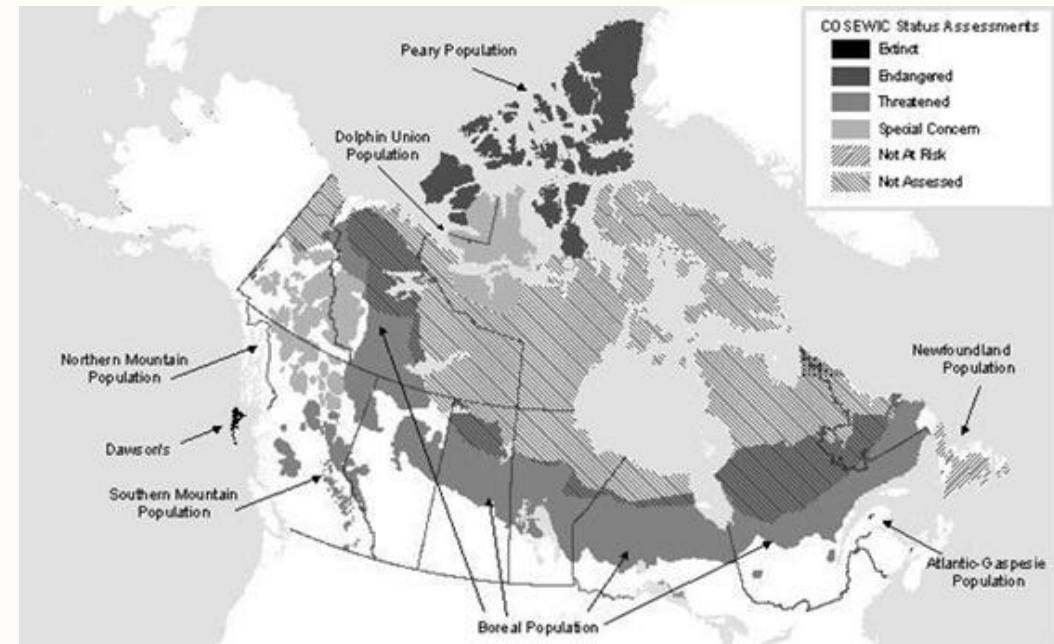


Woodland Caribou Populations

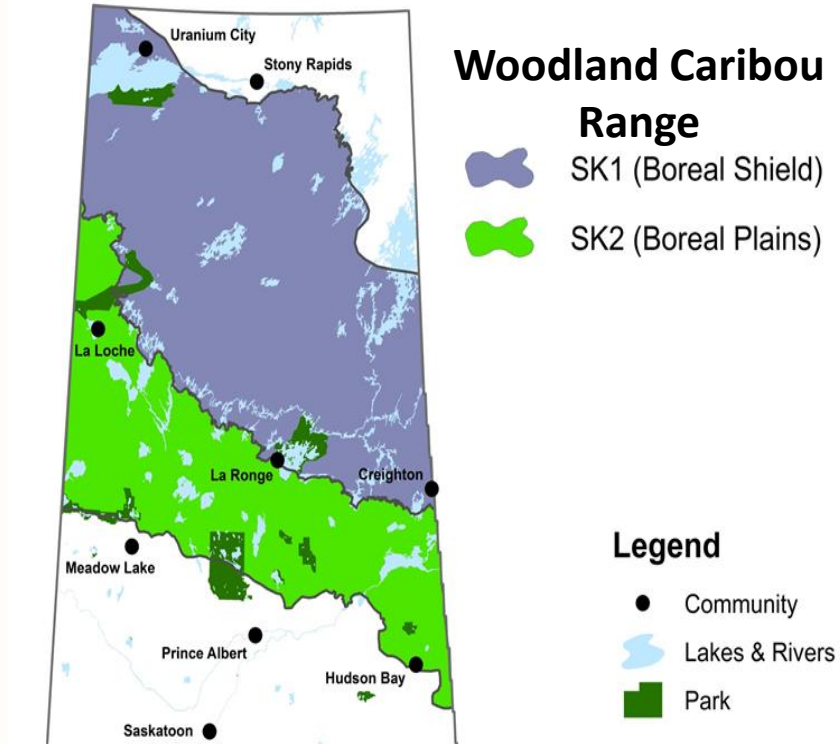
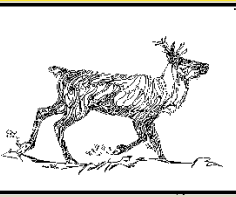


- There are six geographically distinct populations of the forest-dwelling Woodland Caribou:

1. Northern Mountain population (special concern),
2. Southern Mountain population (threatened),
3. Boreal population (threatened),
4. Forest-tundra population (not assessed),
5. Atlantic-Gaspésie population (endangered), and the
6. insular Newfoundland population (not at risk).

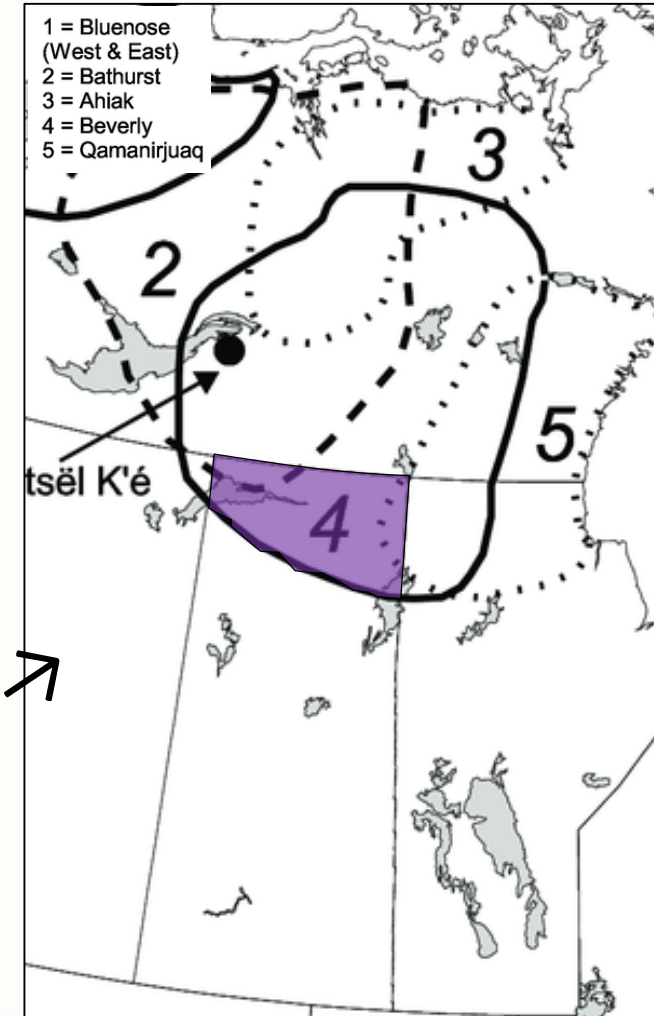


Saskatchewan Caribou Range

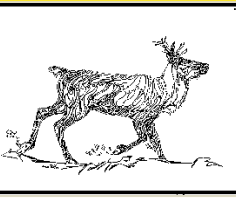


← Saskatchewan's woodland caribou occur in the Boreal Shield (SK1) and Boreal Plain (SK2) caribou conservation units.

- Saskatchewan's barren-ground caribou are generally found in the Taiga Shield and Boreal Shield ecozones.



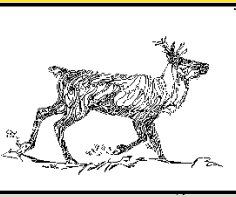
Woodland vs Barren Ground Caribou



- Woodland caribou occur in small groups or solitary.
- They are 'sedentary' and reside in the forest year-round.
- Barren-ground caribou occur in large herds.
- They are migratory and dwell in the tundra in summer, and in the forest / tundra in winter.



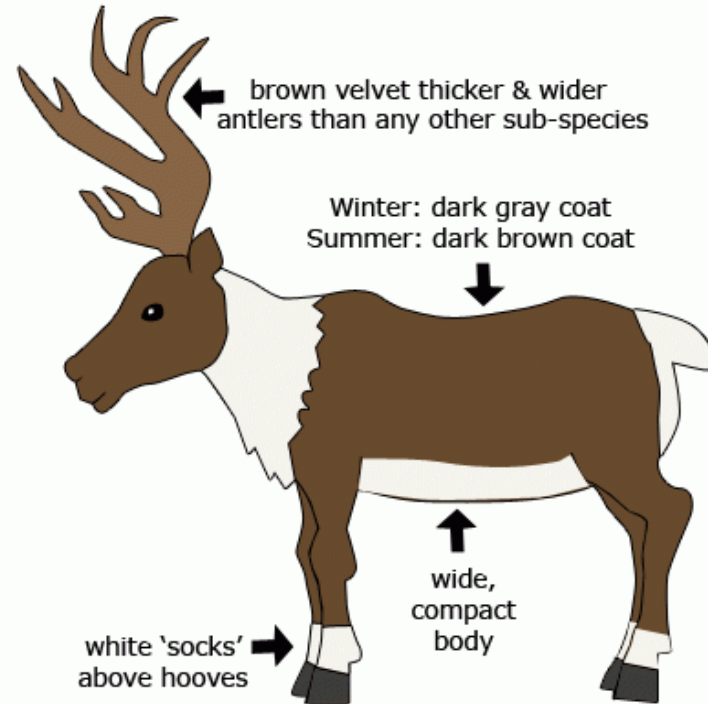
Appearance: Woodland v. Barren Ground



- Woodland caribou are larger than barren-ground caribou or deer but smaller than elk.
- Woodland caribou have large antlers on both males and females and are grey-brown to chocolate in colour with a white mane.

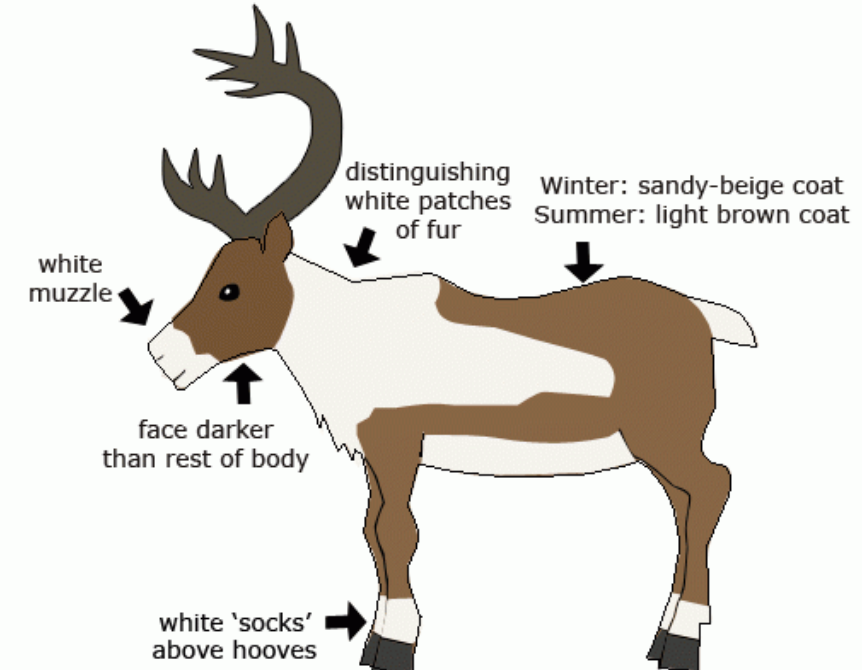
Woodland Caribou

(*Rangifer tarandus caribou*)

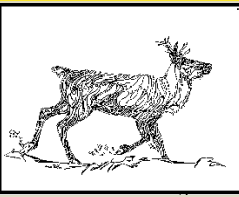


Barren ground Caribou

(*Rangifer tarandus groenlandicus*)

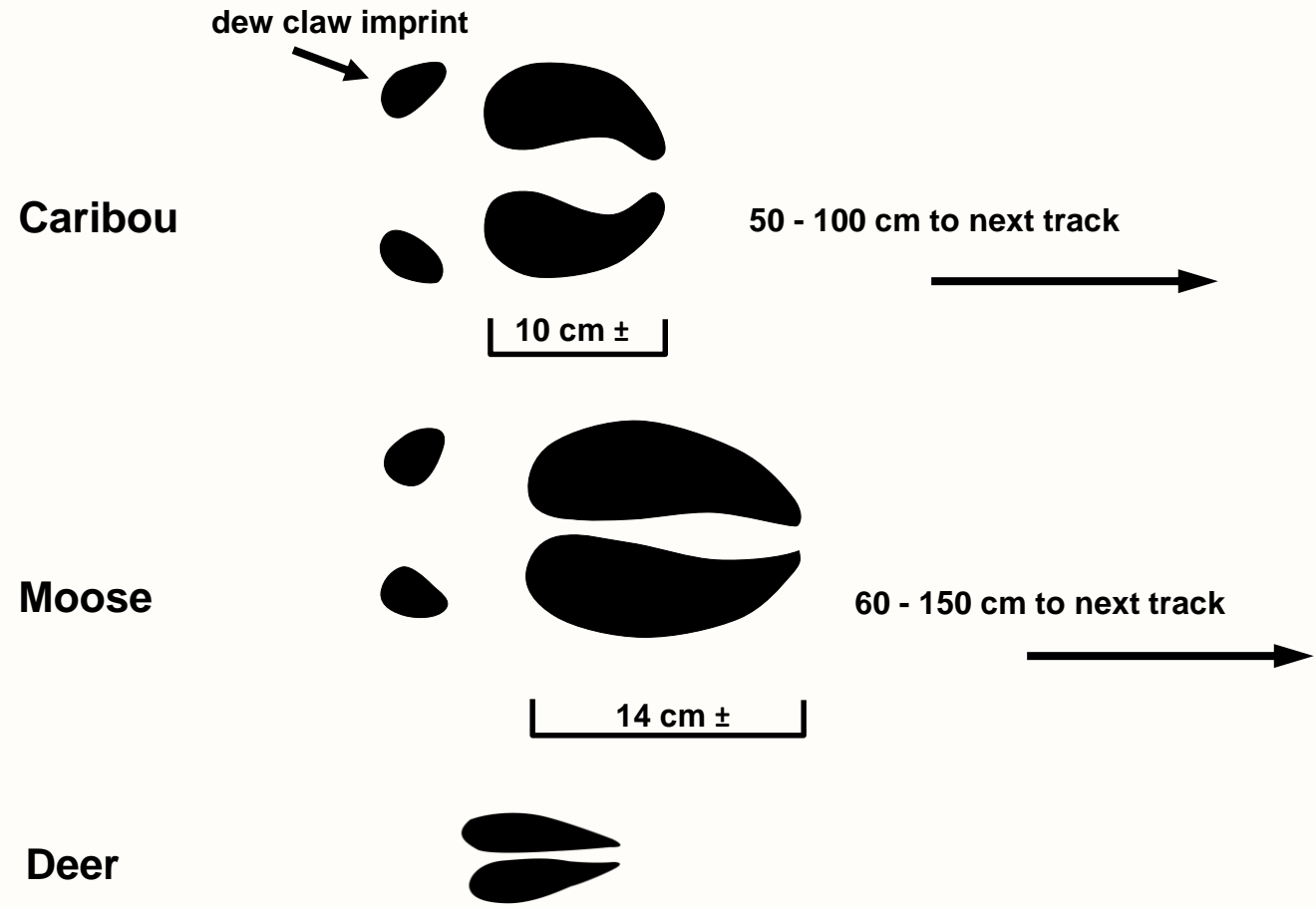


Woodland Caribou Hooves & Fur

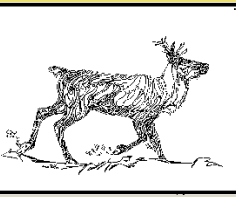


- Woodland caribou are a medium-sized* member of the deer family (*Cervidae*).
- A distinctive characteristic of all caribou is large crescent-shaped hooves that provide flotation in snow and soft ground (e.g. peatlands/muskeg).
- Their unique hooves assist in digging through snow to forage on lichens and other ground vegetation, and paddle in water.
- They also have a dense wooly undercoat that is overlain by stiff, semi-hollow guard hairs which conserves energy, provides greater warmth, and assists flotation.

*1.0-1.2 m shoulder height and weighing 110-210 kg



Woodland Caribou Tracks and Sign



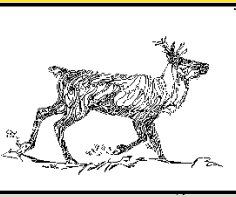
- Examples...



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Woodland Caribou Sign



- Examples
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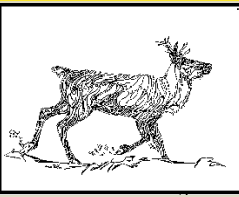


Winter diet

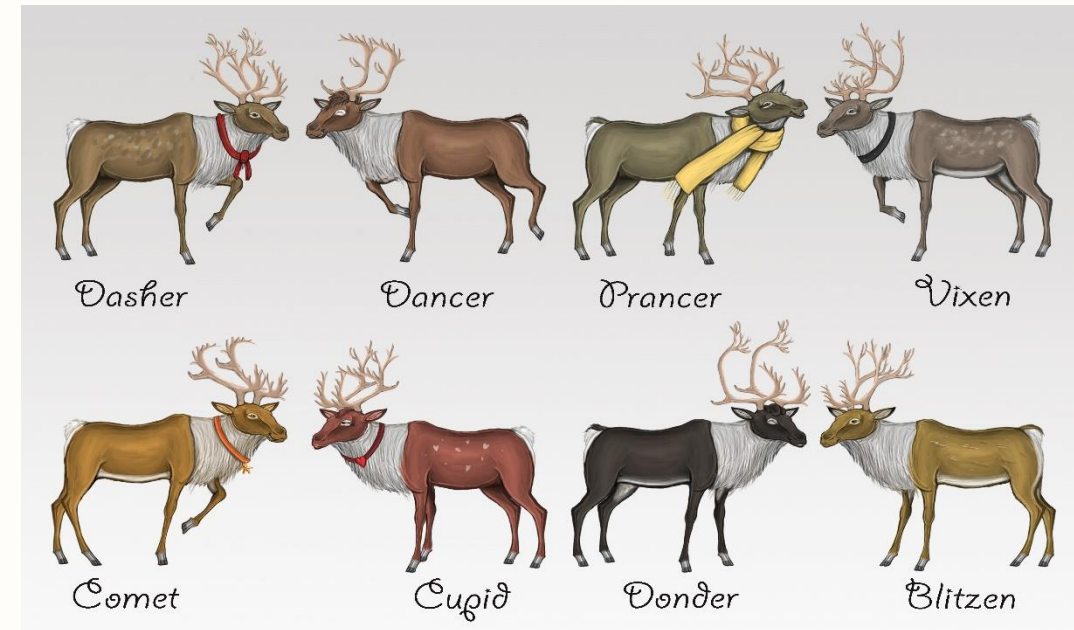


Summer diet

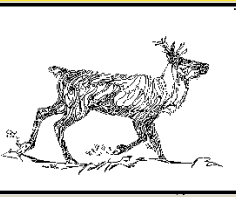
Woodland Caribou Characteristics & Appearance



- Antlers of boreal caribou are flattened, compact, and relatively dense.
- The caribou is the only ungulate (hoofed grazer) with antlers on both male and female although some females may have only one antler or no antlers at all.
- Adult bull antlers can grow as much as 2.5 cm in a day and they shed them in late autumn after mating.
- Females often retain their antlers until spring.



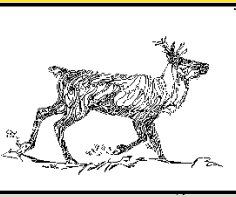
Unique Adaptations



- Large feet – for ease of travel in muskeg, deep snow.
- Semi-hollow hair – greater warmth, flotation, conserves energy.
- Antlers on cows – stores nutrients until calving.
- Twins rare – response to unproductive environment.
- Low density (1 caribou: 20 km²) and large home range (200-1500 km²) allow them to occupy a niche in a cool, slow to change, unproductive environment.



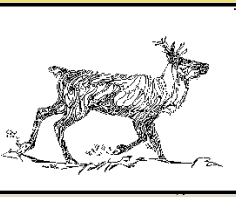
Survival Strategies – Travel & Dispersion



- Travel frequently – to avoid predation.
- Run – to escape predation, and tend to bunch up in openings or on lakes, and will split up in the forest when being pursued.
- Females disperse to secluded places, become solitary and stop moving to give birth – which helps to avoid being detected by predators.
- Calves can walk and run within two hours after birth.



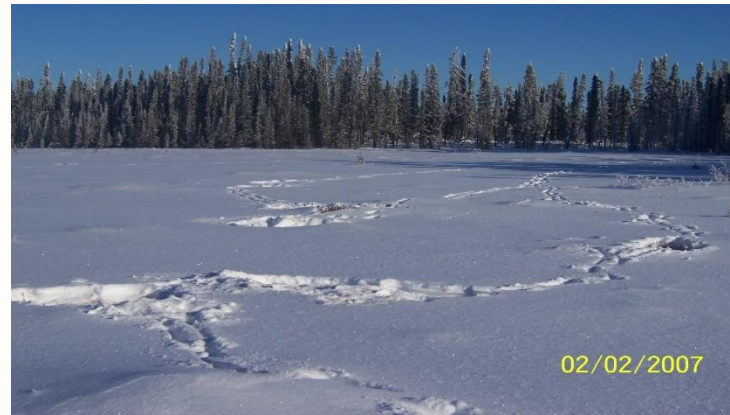
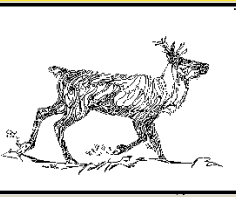
Survival Strategies



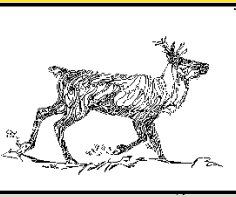
- Cows will not give birth – if stressed from disturbance or lack of food. The calf may not develop or the cow may resorb the fetus over winter.
- Caribou feed heavily and seek nutrient-rich food during the spring and summer:
 - Cows need to feed themselves and a calf,
 - Calves need rich milk to survive, and
 - Bulls need to bulk up as they eat very little during the rut and breeding period.



Home Space - Habitat



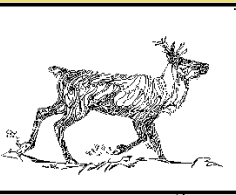
Types of Habitat



- **Forage** – black spruce muskeg, open jack pine/lichen stands, tamarack fens, open black spruce/jack pine.
- **Refuge** – islands, wet areas, wind-exposed sites, lakes, dense older forest.
- **Calving** – islands in lakes or muskeg, inaccessible rough terrain, water-rich terrain, with abundant and nearby forage vegetation.



Habitat interpreted from Ecosites



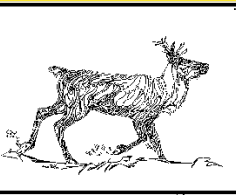
- Woodland caribou prefer mature pine and ~ spruce forests in a mix with treed and open muskegs, ponds and lakes.
- They tend to avoid pure aspen or similar broadleaf forest stands and young stands regenerating after logging or fire.



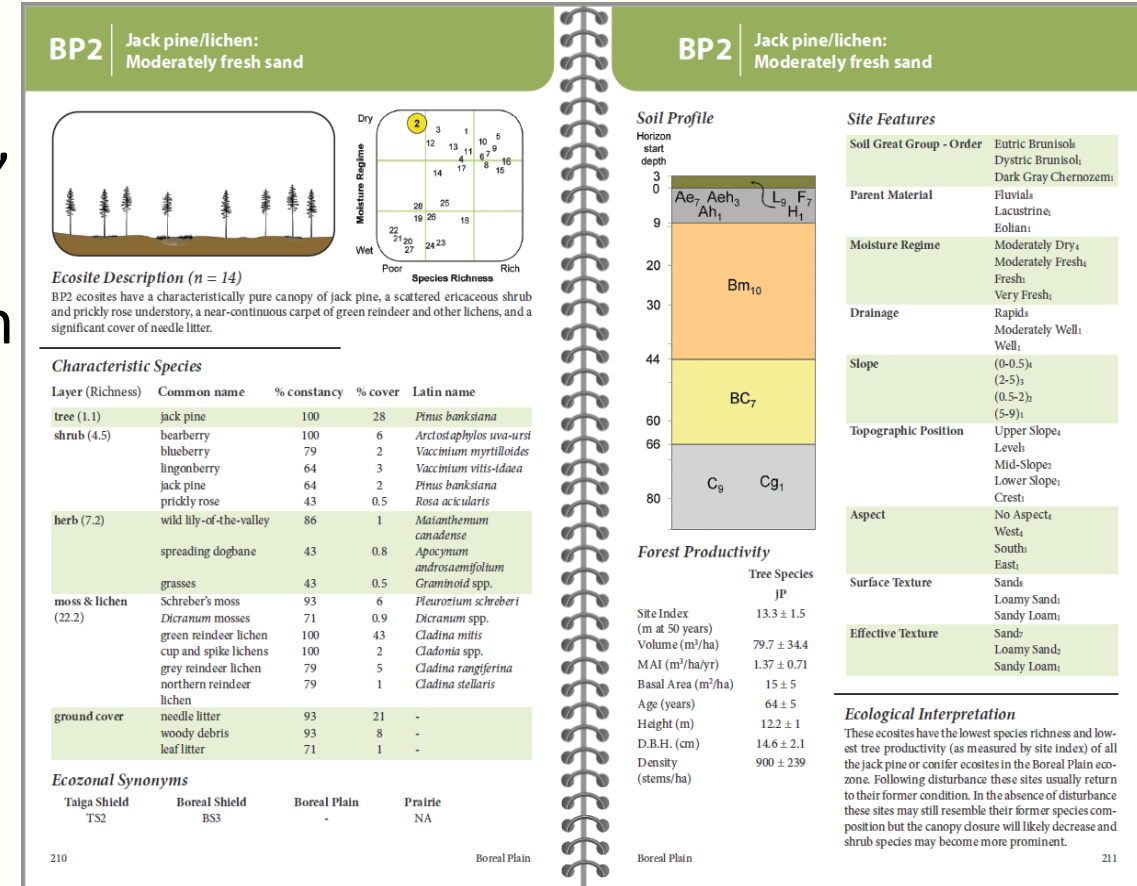
Ecosite	Forage	Refuge	Calving	Overall Habitat Suitability	Habitat Potential
BP1 - June grass - mountain goldenrod grassland: Moderately fresh loamy sand	1	N/A	N/A	0	LOW
BP5 - Trembling aspen / prickly rose / grass: Fresh sand	1	1	1	3	
BP6 - Trembling aspen / beaked hazel / sarsaparilla: Fresh loamy sand	1	1	1	3	
BP7 - Trembling aspen - white birch / sarsaparilla: Fresh loamy sand	1	1	1	3	
BP8 - Trembling aspen - white birch / mountain maple: Fresh sandy clay loam	1	1	1	3	
BP9 - White spruce - trembling aspen / feathermoss: Fresh sand	1	1	1	3	
BP10 - Trembling Aspen - white spruce / feathermoss: Fresh silty loam	1	1	1	3	
BP11 - White birch - white spruce - balsam fir: Fresh sandy clay loam	1	1	1	3	
BP13 - White spruce - balsam fir / feathermoss: Fresh sandy clay loam	1	1	1	3	
BP15 - Balsam poplar - white spruce / feathermoss: Very moist silty loam	1	1	1	3	
BP16 - Balsam poplar - trembling aspen / prickly rose: Fresh clay loam	1	1	1	3	MODERATE
BP17 - Manitoba maple - balsam poplar / ostrich fern: Moist silty clay loam	1	1	1	3	
BP18 - Black spruce - tamarack treed swamp: Wet humic organic	1	2	2	5	
BP20 - Labrador tea shrubby bog: Wet fibric organic	2	3	1	6	
BP21 - Graminoid bog: Wet fibric organic	1	2	1	4	
BP22 - Open bog: Wet humic organic	1	3	1	5	
BP23 - Tamarack treed fen: Wet fibric organic	2	2	1	5	
BP24 - Leatherleaf shrubby poor fen: Wet fibric organic	1	2	1	4	
BP25 - Willow shrubby rich fen: Wet humic organic	1	2	1	4	
BP26 - Graminoid fen: Wet humic organic	1	2	1	4	
BP27 - Open fen: Wet fibric organic	1	3	1	5	HIGH
BP28 - Seaside arrow-grass marsh: Very moist humic organic	1	2	1	4	
BP2 - Jack pine / lichen: Moderately fresh sand	3	3	1	7	
BP19 - Black spruce treed bog: Moderately wet fibric organic	2	3	3	8	

<https://www.saskatchewan.ca/business/agriculture-natural-resources-and-industry/forestry/forest-ecosystems>

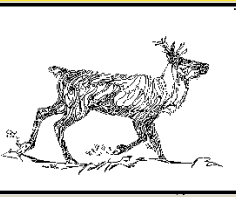
Other Important Habitat



- **Travel** - existing game trails, ridges, streamsides/riverbanks, frozen water courses, open slopes, open understory stands.
- High caribou traffic on specific travel ways can often be detected by the abundance of less-preferred lichens left on these sites (e.g., tomentose snow lichen - *Stereocaulon tomentosum*).



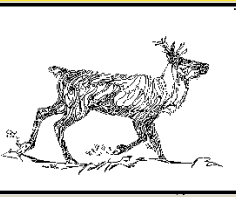
Habitat for Forage



- Ground lichens, especially the reindeer lichens (i.e., *Cladina* spp.) are the most important forage from late summer through winter.



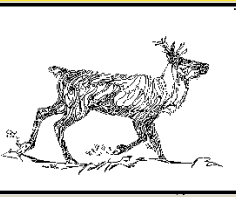
Spring Forage



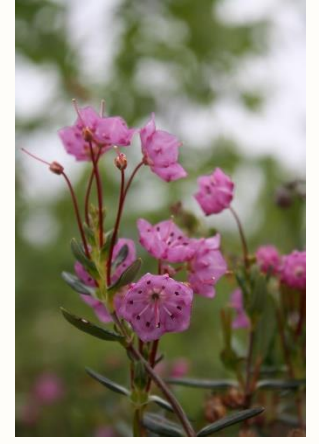
- In spring and summer, caribou eat a variety of herbs, sedges, mushrooms, fruit and leaves of evergreen shrubs.



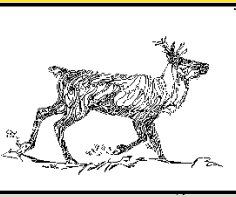
Other Species



- Specific forage species for the woodland caribou include:



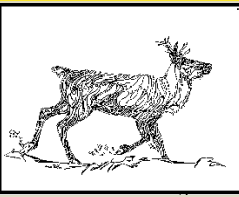
Woodland Caribou Habits



- Digging/Cratering (e.g., the one who digs/shovels)
 - to forage on lichens.
 - to eat slush on lakes.



Other Woodland Caribou Habits

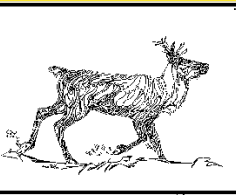


- Generally travel in groups of 8-10: females, calves, sub-adults, mature bull.
- Mature cow leads the group: when travelling.
- Mature bulls defend a harem: limits the number of bulls that breed and breeding cows in the harem are usually only bred by one bull.
- Mature bulls: solitary, or in groups of 5-10.
- Mature or sub-adult cows: sometimes solitary and seasonally.



Plate 3.1. Two adult female caribou and a 10-11 month old calf of the Saskatchewan Boreal Shield in March, 2018 (photographed from the air while conducting a calf/cow survey). Females are distinguished from males by the black vulvar patch discernable when running. Photo credit: Clara Superbie.

Wandering Habit



- Bulls or cows do wander:
 - Mature bulls, sub-adult bulls or cows may explore beyond the range of their relatives to ultimately mix with neighboring or even distant groups of caribou.

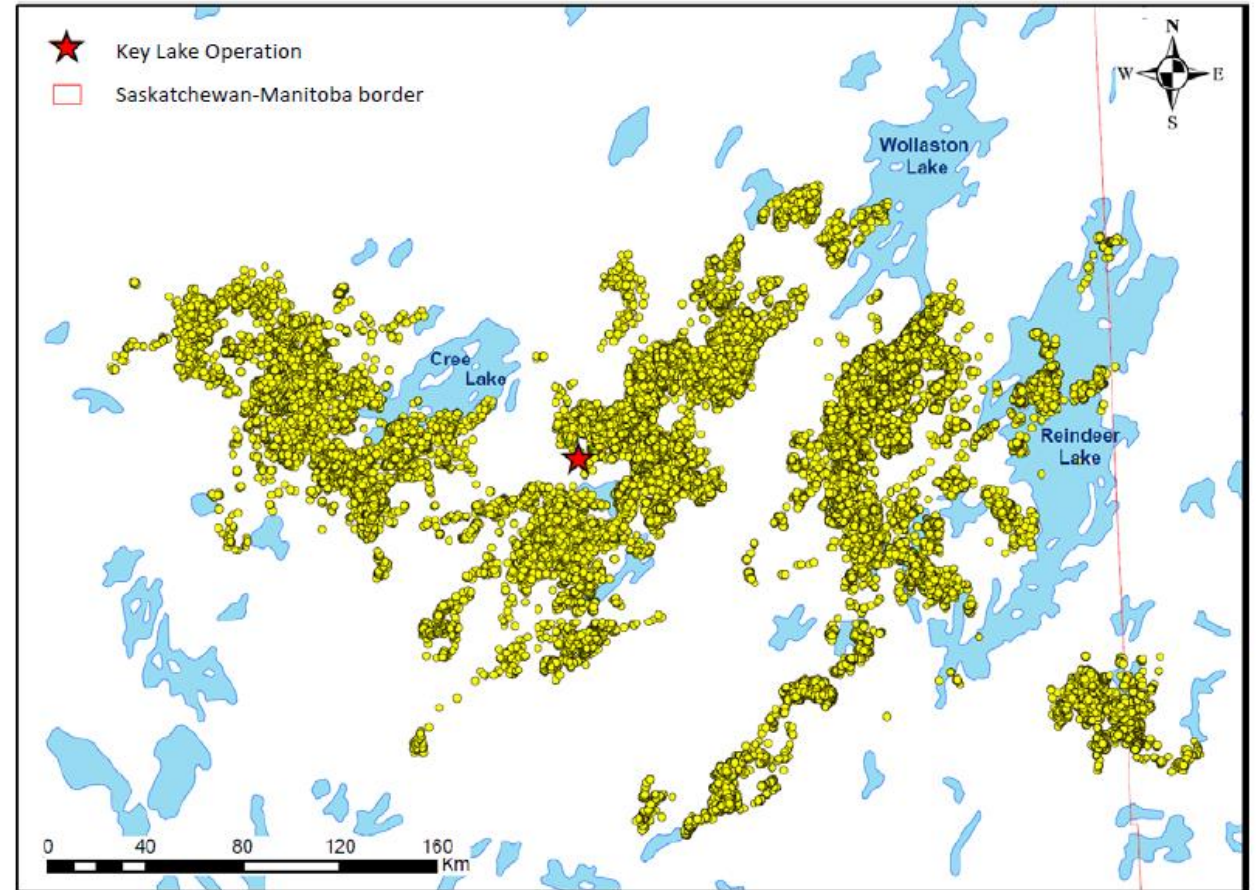
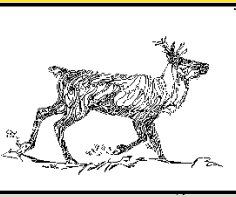


Fig. 3.3. Location data from 94 GPS-collared caribou obtained in a single year, Saskatchewan Boreal Shield, 2014. The Key Lake uranium operation is represented by the red star.

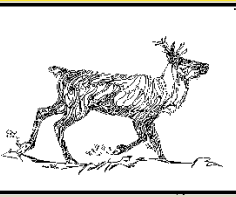
Woodland Caribou Life Cycle (Fall)



- The rut – begins in September, bulls gather and spar.
- Caribou mate around mid-October and males can have many mates.
- Male caribou begin to mate around the age of 1.5 years.
- Breeding – occurs in October, bulls seek out groups with cows where mixing may occur in traditional areas.



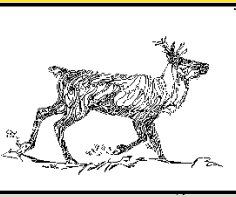
Woodland Caribou Life Cycle (Winter)



- Early Winter
 - Bulls, cows, sub-adults and calves gather into large groups (20-30) where socializing occurs. Later, the group drifts apart into small bands (5-10) of mature cows, their calves, sub-adult offspring, and relatives.
 - Mature bulls separate into small male bands or become solitary.



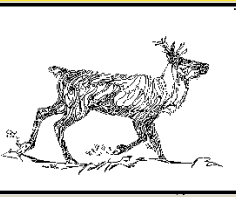
Woodland Caribou Life Cycle (Late Winter)



- Winter: caribou seek out the best foraging areas.
- Late winter:
 - Caribou seek out sheltered forest with less snow cover.
 - Travel in small bands or solitary.



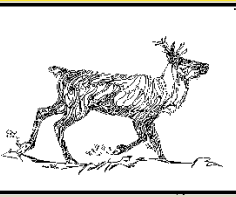
Woodland Caribou Life Cycle (Spring)



- In late March, caribou gather into large groups, followed by dispersal into small bands.
- Birthing cows become solitary and move to secluded locations.
- After a gestation period of about 230 days the calf is born in May/June.



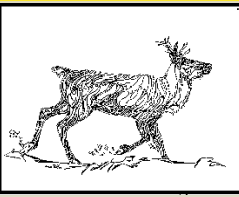
Woodland Caribou Life Cycle (Birthing & Rearing)



- Birth – A single calf is born to a cow in late May/early June.
- Most bred cows (~90%) give birth to a calf.
- Twin calves are rare.
- Rearing: Cow and calf stay in one place until late July. The calf is weaned after about two months.



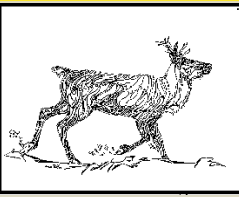
Woodland Caribou Life Cycle (Calf Survival 1)



- High Mortality – Less than one quarter of calves survive the first year of life (12-25% survival).
- Neutral growth – Caribou herds will remain the same size or slightly increase in relation to the above levels of calf survival.
- Low calf survival make caribou vulnerable to sudden, dramatic changes in their range or habitat.



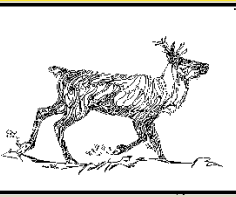
Woodland Caribou Life Cycle (Calf Mortality)



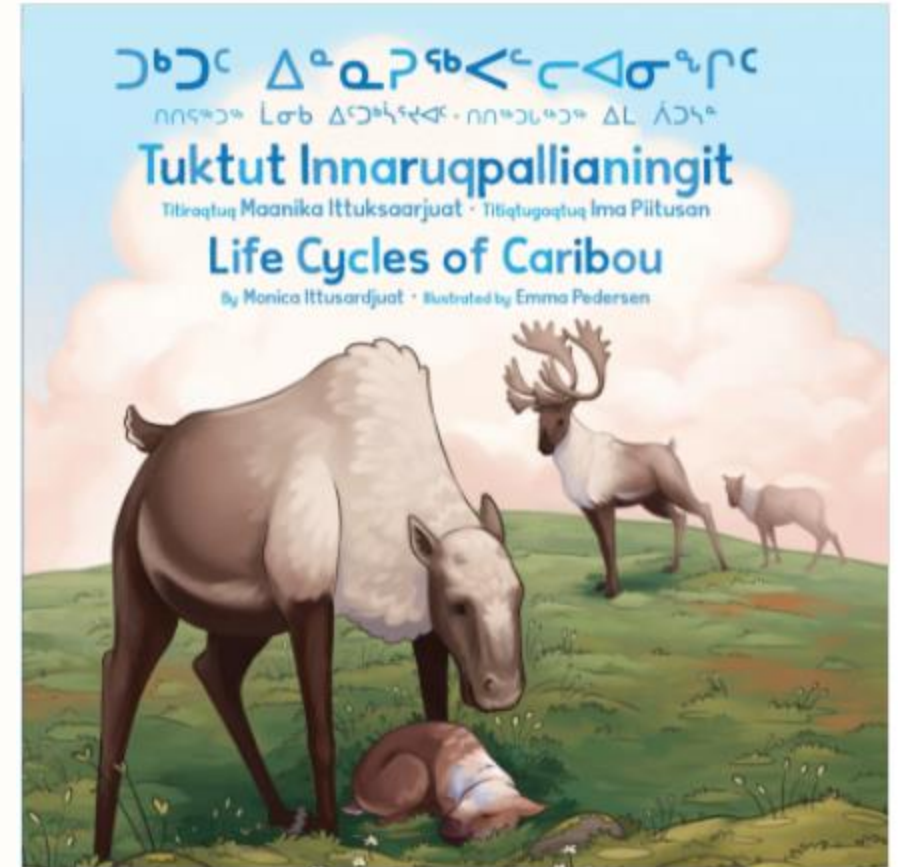
- Mortality causes – calves may die shortly after birth from complications during birth, drowning, attacks from gulls or ravens, severe weather, chronic illness or predation.
- Later in the season, they may be affected by poor nutrition, predation.
- As they overwinter, predation and severe weather reduce survival.



Lifespan



- The average lifespan of an adult caribou is about 8 to 15 years.
- They reach maturity at about three years.



Threats to Woodland Caribou

- Predation
 - **Wolves:** caribou are a food source but not the main prey of wolves.
 - Caribou avoid predators by continuously moving over large tracts of forest and not bunching up, making them harder to find.
 - Disturbance to their habitat gives predators a hunting advantage.



Plate 8.1. A timber wolf of the Saskatchewan Boreal Shield in May, 2016. Photo credit: Clara Superbie.

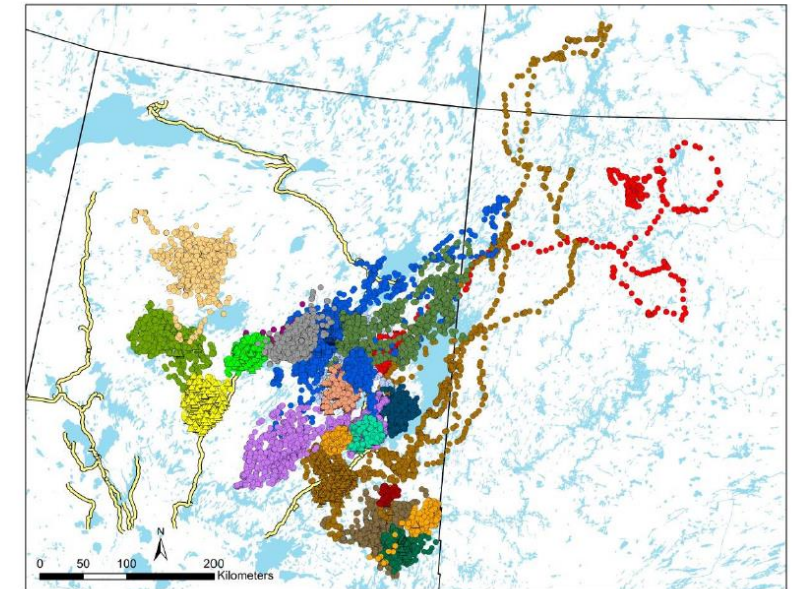
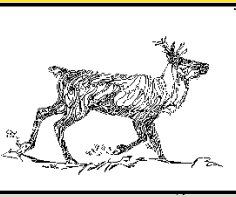


Fig. 8.1. GPS location data obtained from 37 wolves (21 packs + 1 solitary wolf) within Canada's Western Boreal Shield collected between March 2014–2016 (territory-size analysis [Table 8.1] included data for 17 packs with at least 9 months of data). Circles, squares and triangles represent GPS locations of individual wolves while symbol colour indicates pack membership. Yellow lines are roads in the study area.



Threats to Woodland Caribou (2)



- Predation
 - Black bear: occasionally on calves but not a limiting factor.
 - Lynx, coyote: no reports but may occur rarely on calves.
 - Cougar, wolverine: with such low densities on caribou range, it is expected that predation is negligible.
 - Hunting: SK has had no licensed hunting for woodland caribou since 1987. Further, there is a reportedly low harvest by First Nations and Metis of woodland caribou.

Status of Woodland Caribou in the Saskatchewan Boreal Shield

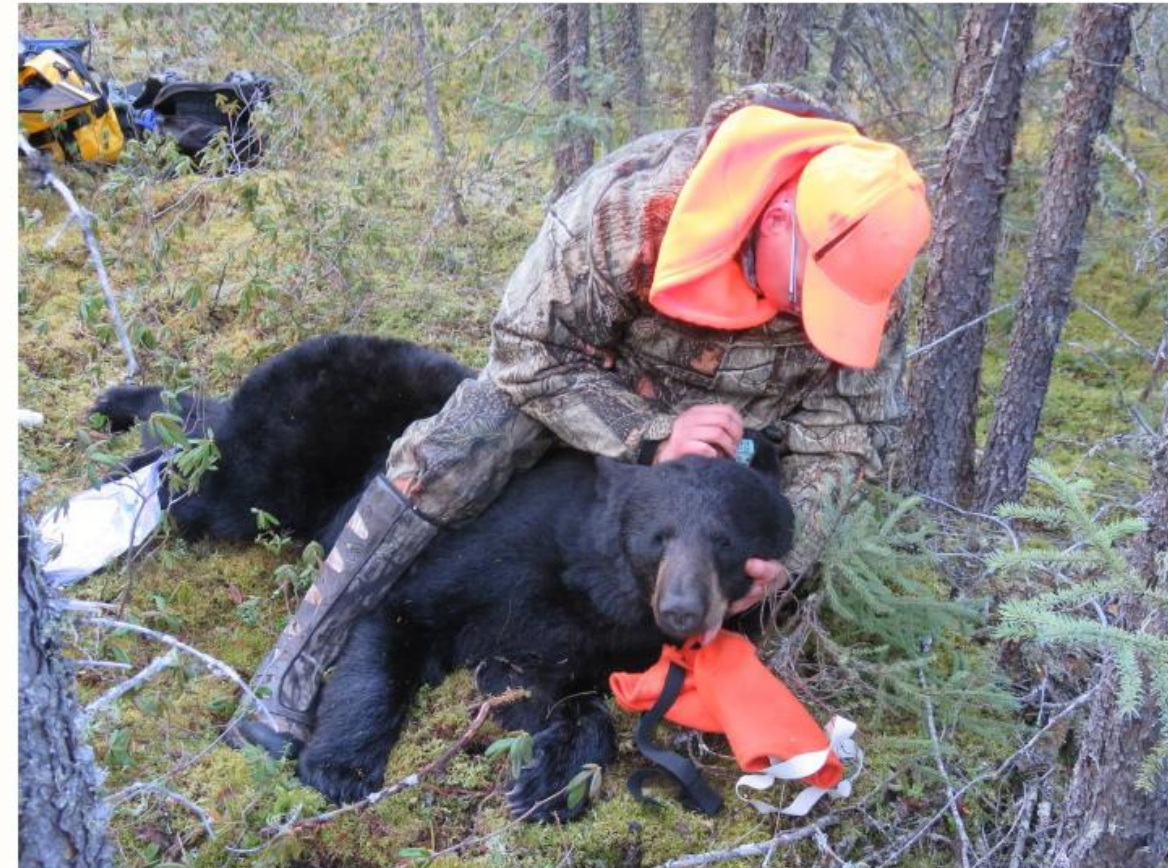
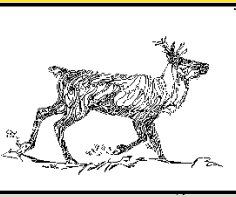


Fig. 9.2. An immobilized adult female black bear after being fitted for a GPS-satellite collar, just prior to administration of the drug reversal agent and release (Saskatchewan Boreal Shield, May, 2017).

Threats to Woodland Caribou (3)

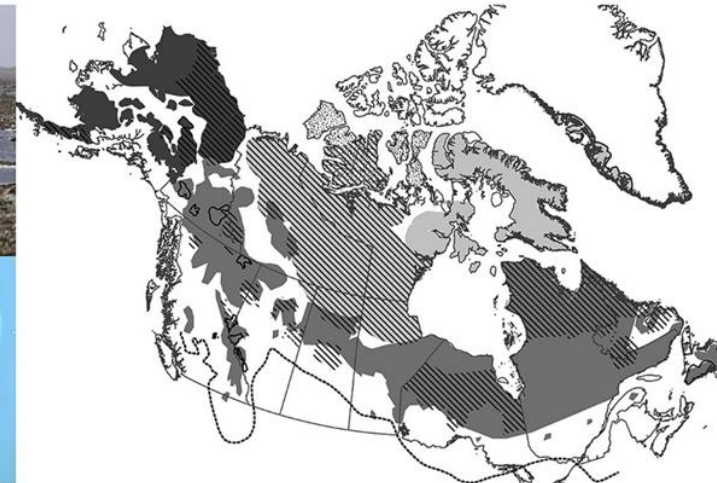


- Parasites and disease – caribou are susceptible to a variety of parasites and diseases, the degree to which they impact the species is not well known (e.g., brain worm, chronic wasting disease).

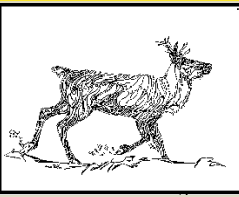


- Insects:
 - The Warble Fly lays eggs on a caribou's flank where the larvae are hatched and burrow up to the caribou's back, feeding on skin and fat.
 - The Nostril Fly (Nosebots) irritates the caribou's nose and the caribou licks it off/sneezes it out. The fly makes its way to the sinuses and airways at the back of the throat.

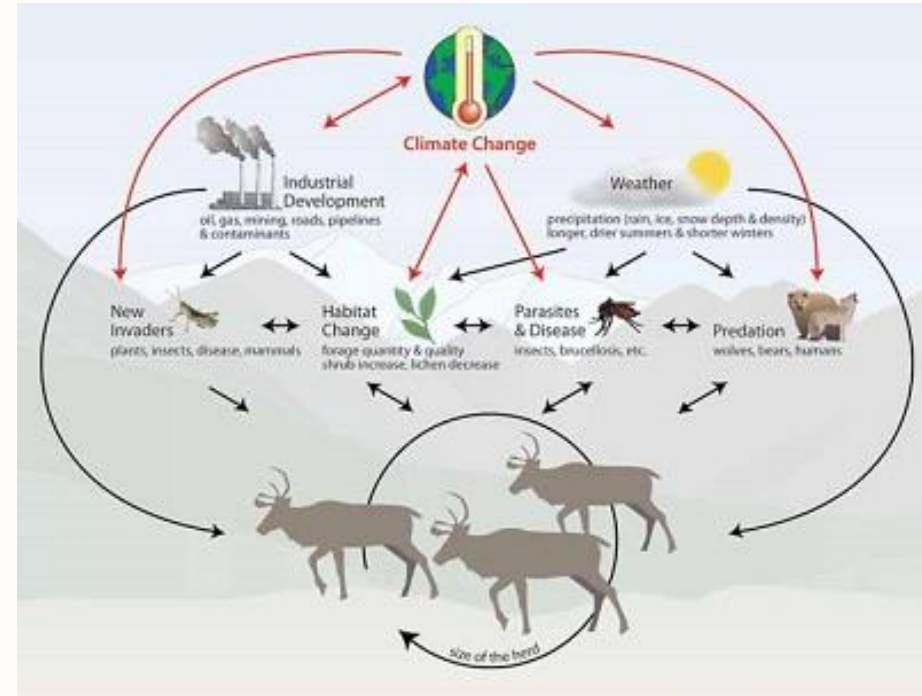
Distribution of the caribou lungworm, *Varestrongylus eleguneniensis*



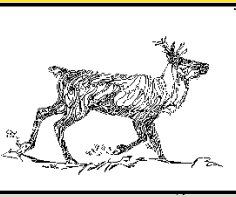
Threats to Woodland Caribou (4)



- Climate change research points to a somber forecast of future conditions and challenges for the conservation of woodland caribou.
 - Cascading, cumulative, and consequential climate change effects such as habitat degradation and loss, increased predation, increased disease, and other factors make management planning for woodland caribou particularly challenging.
- Accidents – hit by a vehicle, falling through ice, etc.
 - In some areas, boreal caribou are vulnerable to mortality from vehicle or rail collisions, however, on a national scale, vehicle collisions are not thought to pose a major threat to boreal caribou.



Threats to Woodland Caribou Habitat (1)



- Natural habitat (landscape) disturbance:
 - Woodland caribou habitat is susceptible to wild fire, plough-winds causing blow down, forest insect and disease outbreaks, and flooding.

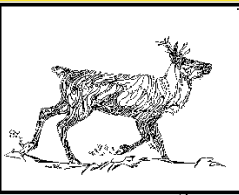


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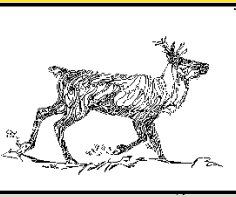
Threats to Woodland Caribou Habitat (2)



- Human habitat (landscape) disturbance:
 - Can occur in many forms and can cause:
 - Direct loss of habitat:
 - ...the complete loss or conversion of habitat to a condition that no longer provides functional habitat.
 - Degradation of habitat:
 - ...a deterioration of habitat quality and availability.
 - Fragmentation of habitat:
 - ...separation of otherwise functional habitat.

Activity
Conversion of habitat to agriculture
Transportation – road or trail development
Forestry cut blocks
Wildfire
Mining development – peat
Mining development – other
Oil and gas development
Urban/community development
Seismic/Exploration/Geophysical lines
Tourism - snowmobile or ATV trail development
Pipelines
Electrical power transmission lines
Pollution - mining development
Pollution - oil and gas development
Drainage - peat development

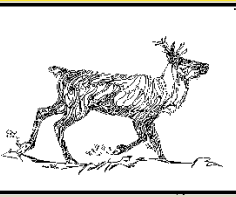
Adapted, but Sensitive



- Boreal caribou have evolved with, and adapted to, the natural disturbance regimes of boreal forest ecosystems that determine the availability and distribution of habitat over time.
- However, habitat loss, reduction in habitat patch size, and fragmentation due to land conversion and resource development, and increased predation associated with these changes, have been identified as the main causes of the decline of boreal caribou in Canada.



Evidence of Woodland Caribou Decline



- Range retraction from the south.
- Reports of caribou absence from some areas.
- Reports of smaller group sizes.
- Decline in hunter success over a few decades.
- Retracted movements in some areas.
- Shrinking home ranges from movement data.
- Habitat conversion, disturbance causing isolation.

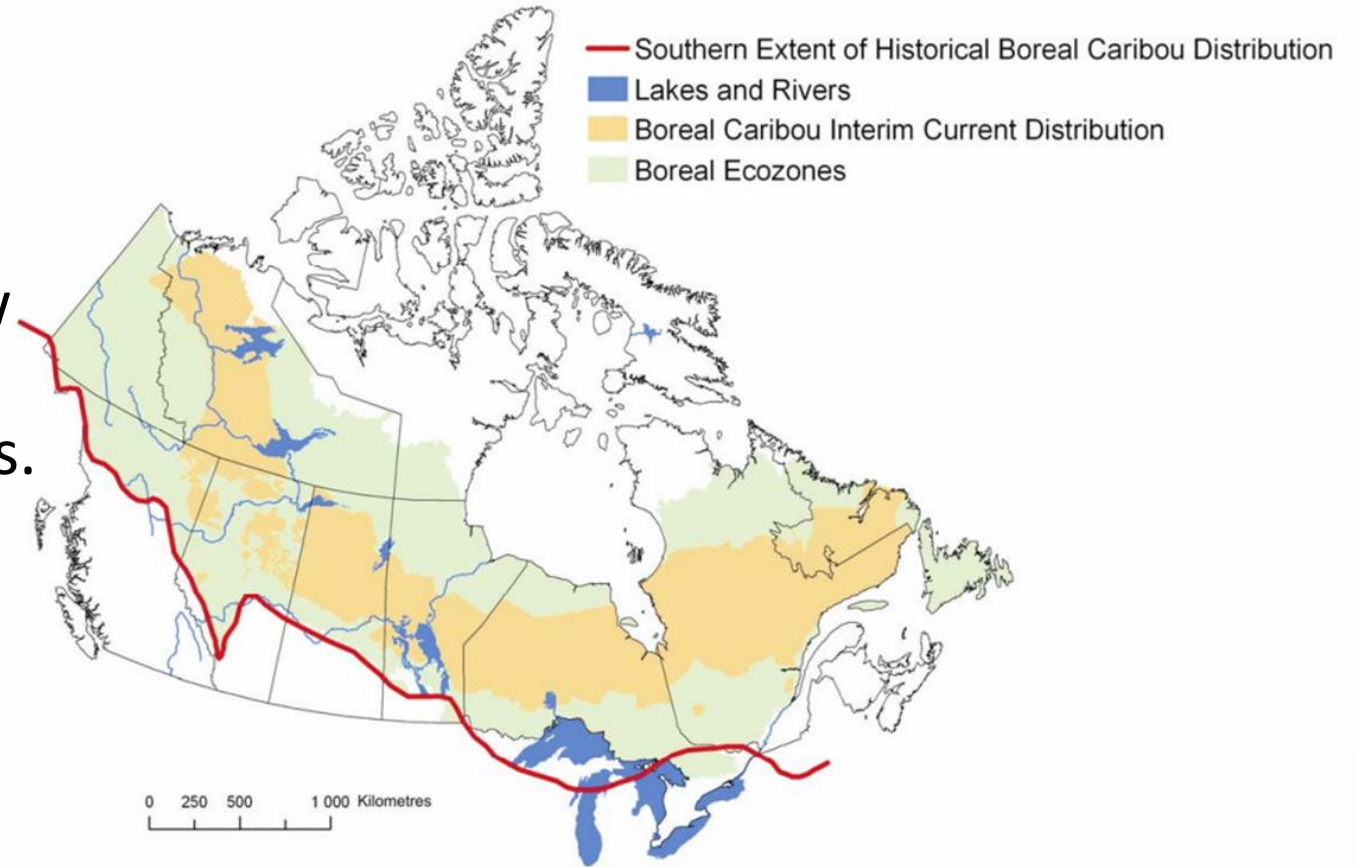
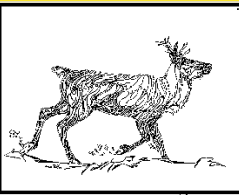


Figure 3. Distribution map of boreal caribou in Canada showing the current distribution of boreal caribou using updated information provided by jurisdictions. Note: Because of the lack of information on the historical distribution of boreal caribou in B.C. relative to the mountain ecotype of woodland caribou, the historical southern extent in that province is based on the boreal ecozones boundary.



The Status of Woodland Caribou Across Canada

- Woodland caribou are present across Canada:
 - From the Northwest Territories (extending into Yukon), British Columbia, Alberta, Saskatchewan, Manitoba, Ontario, Quebec, Newfoundland and Labrador.
 - In 51 woodland caribou ranges.

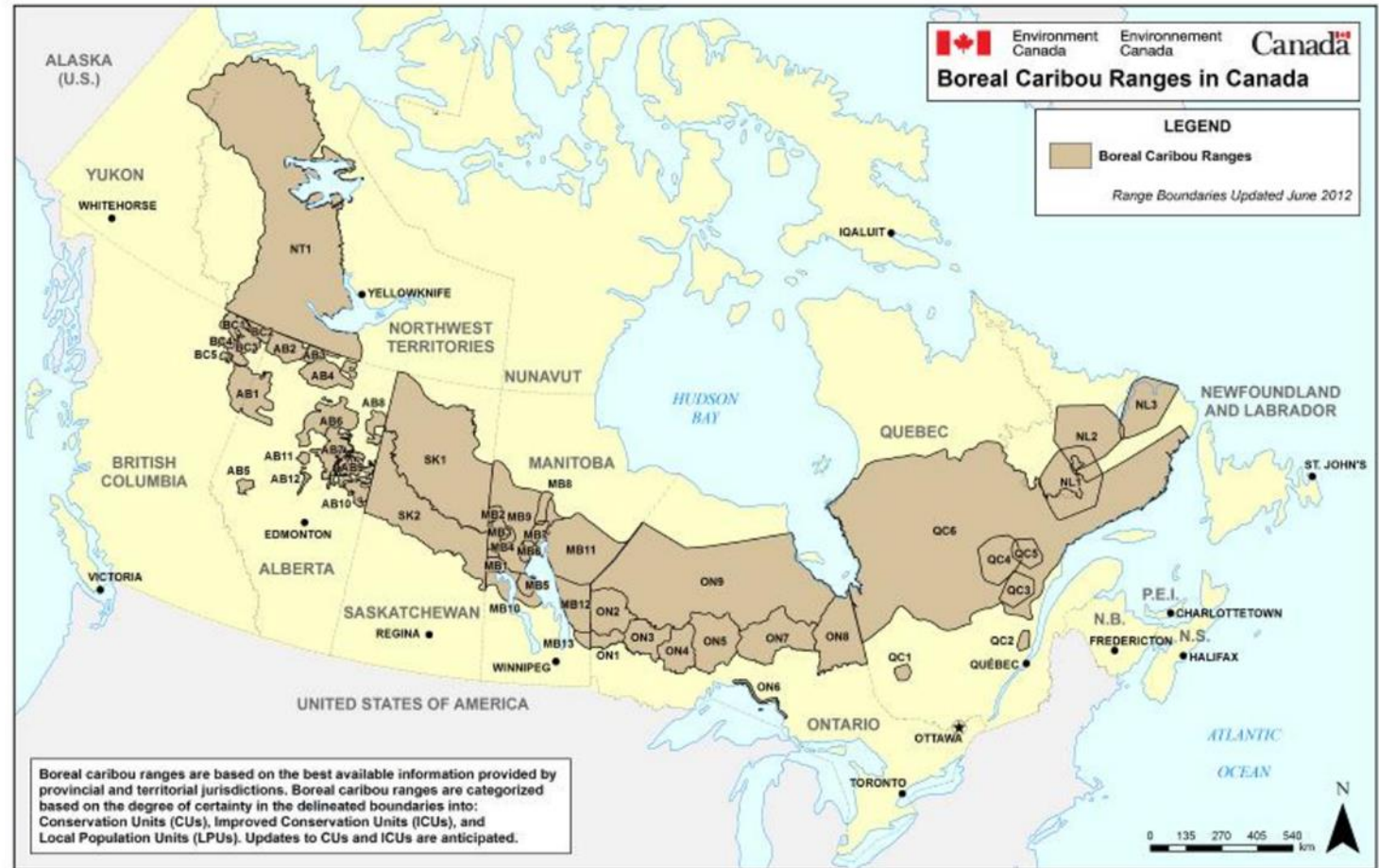
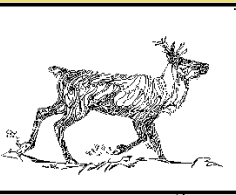


Figure 2. Geographic distribution of the 51 known ranges of boreal caribou in Canada.

Canadian Woodland Caribou Range Size



- Ranges vary greatly in size:
 - Northwest Territories range: NT1 = 44,166,546 ha
 - Charlevoix range: QC2 = 312,803 ha.
- Whether a range can support a self-sustaining local population is a function of both the amount and quality of habitat available for boreal caribou.
- Of the 51 boreal caribou local populations the federal risk assessment determined that:
 - 15 are “self-sustaining”,
 - 26 are “not self-sustaining”,
 - and 10 are “as likely as not self-sustaining”.

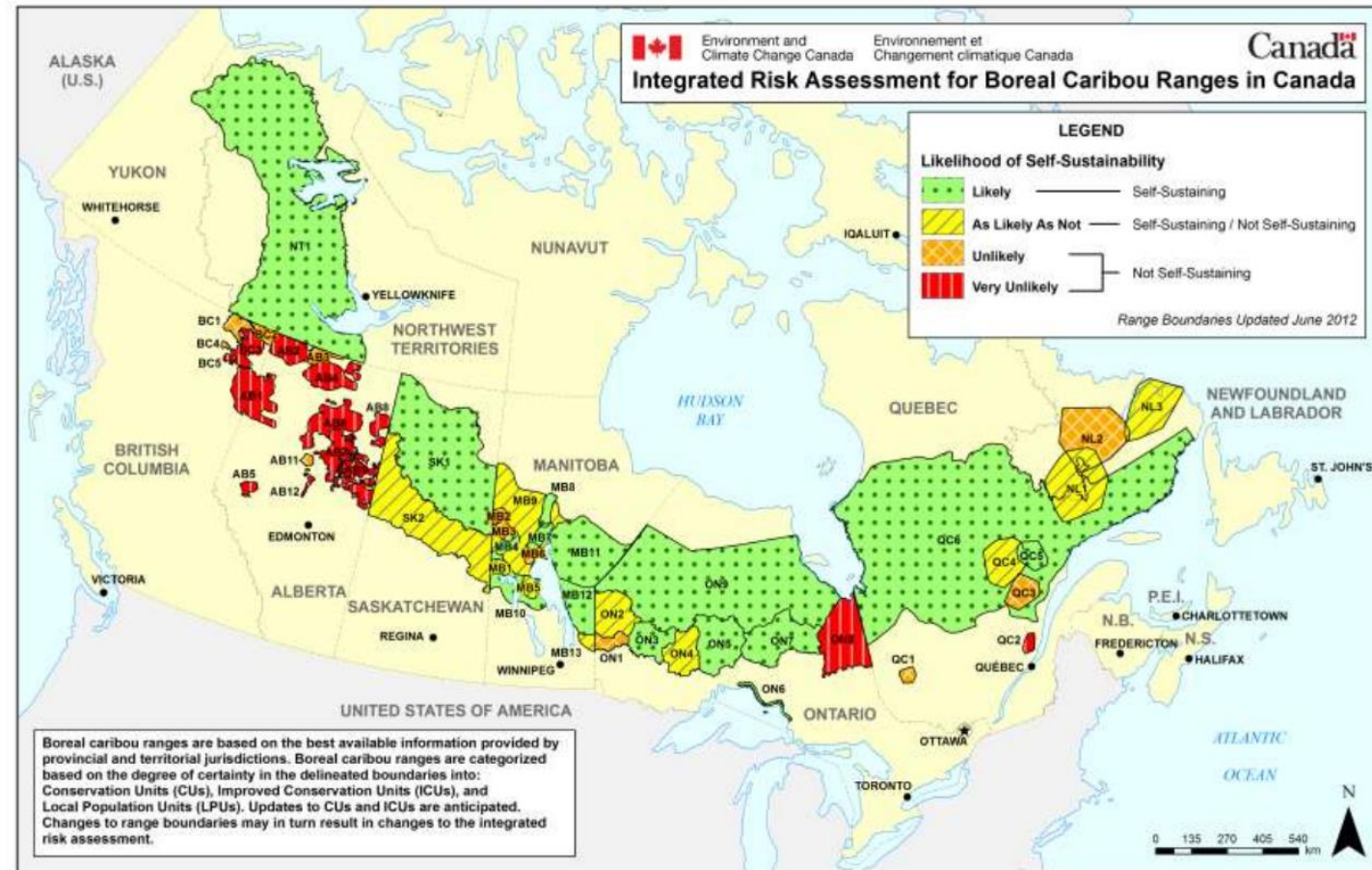
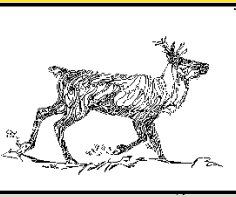


Figure 3. Integrated risk assessment for boreal caribou ranges in Canada as of June 2012, reflecting the capacity of each range to maintain a self-sustaining local population of boreal caribou. The likelihood of self-sustainability for the Boreal Shield range (SK1) has been updated from “unknown” to “likely” in this amended recovery strategy. The integrated risk assessments for the remaining ranges have not been updated.

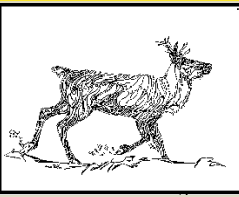
Species Population Condition



- How do we know if a species is threatened?
- In an assessment of current caribou condition based on an observed, estimated, inferred or suspected reduction in population size of $> 30\%$, over three caribou generations (approximately 20 years), Boreal caribou were determined to be and listed as “threatened” under *Canada’s Species at Risk Act*.



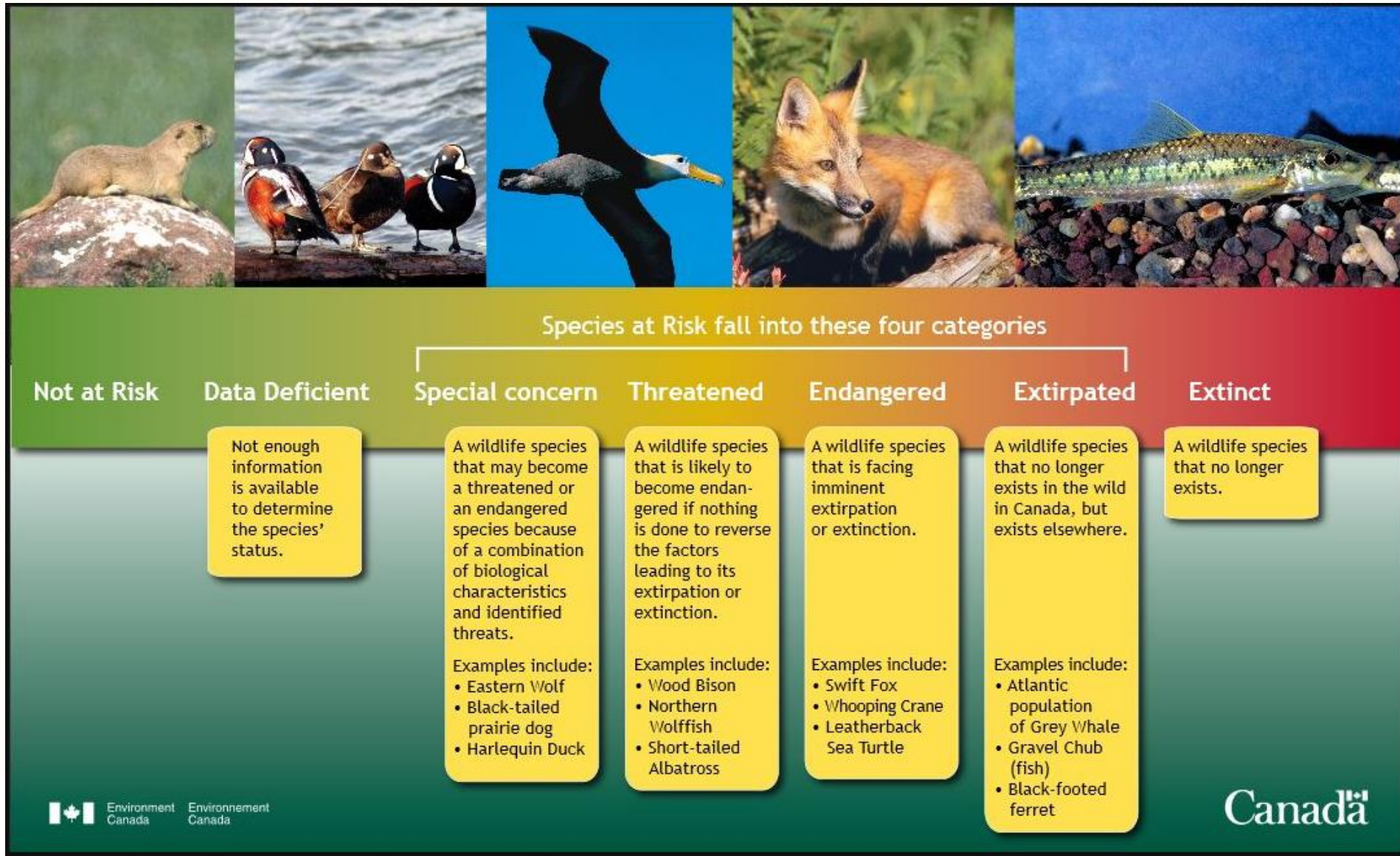
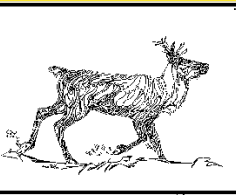
Species at Risk Act (SARA)



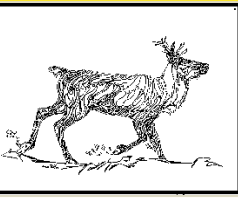
- The SARA is a piece of Canadian federal legislation which came into effect on December 12, 2002.
- The purposes of the *Species at Risk Act* (SARA) are to:
 - Prevent wildlife species in Canada from disappearing,
 - Provide for the recovery of wildlife species that are extirpated, endangered, or threatened as a result of human activity, and
 - Manage species of special concern to prevent them from becoming endangered or threatened.
- In 2002 the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) identified Boreal caribou as “Threatened”, and
- Boreal Caribou were added to Schedule 1 of the *Species at Risk Act* (SARA) in 2003.



Threatened? - Species at Risk Categories



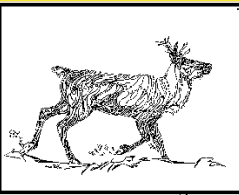
Why Should We Care About Caribou?



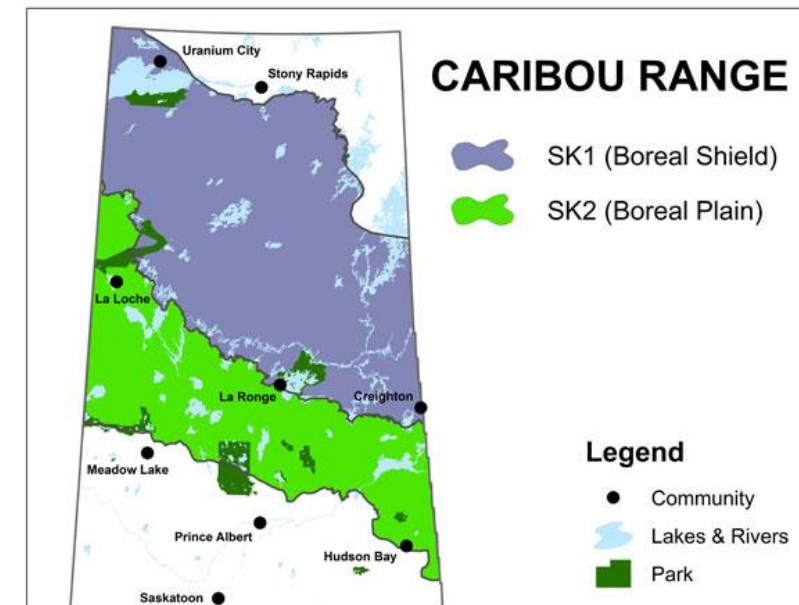
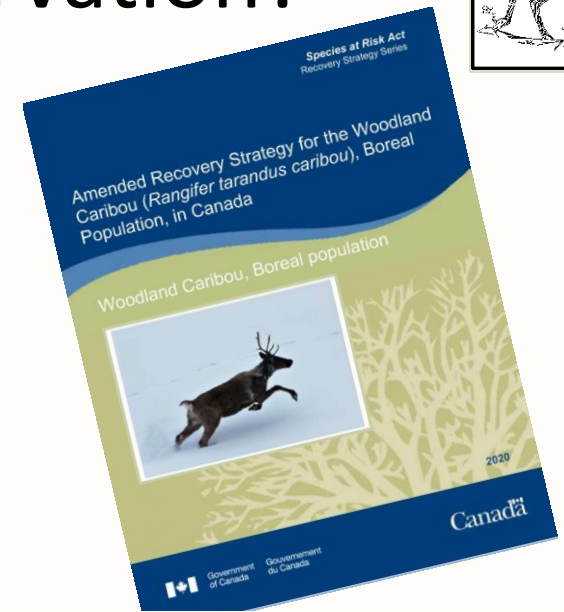
- Research from universities across Canada show that the health of caribou populations is a signal of the overall health of our boreal forests.
- The species is critical to conserve because of its:
 - Cultural significance,
 - Its association with carbon-rich habitats, and the ecological/ecosystem services, and
 - Its benefit to climate.
 - Conservation of boreal caribou habitat such as peatlands and boreal forest can benefit the climate due to the massive amount of carbon stored in these ecosystems, which would otherwise be released into the atmosphere if the land were developed.
- Woodland caribou conservation has carry-over effects.
 - Because caribou distribution overlaps with 90% of other boreal forest bird and mammal species, it makes them an “umbrella” species.
 - That is, conservation measures for one species that has a large home range and broad habitat requirements, will benefit other species contained within those habitats.
- Caribou conservation, therefore, can be considered a proxy for boreal forest conservation.



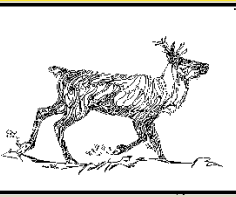
So What is being Done for Caribou Conservation?



- In 2012, the federal government released the:
- *Recovery Strategy for the Woodland Caribou Boreal Population in Canada* (& amended it in 2020).
- For Saskatchewan's SK2 (Boreal Plain and other Canadian ranges), the recovery strategy identifies that a disturbance management threshold of 65% undisturbed habitat is required in order to provide the local population of woodland caribou with a 60% probability to be self-sustaining.
- For Saskatchewan's SK1 (Boreal Shield), a 40% undisturbed habitat and less than 5% human disturbance footprint is required in order to provide the local population of woodland caribou with a 71% probability to be self-sustaining.



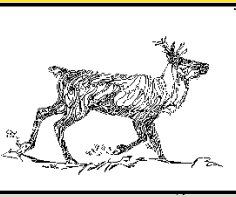
The Strategic Caribou Recovery Path



Date	Action
2002	Boreal woodland caribou were listed as “threatened” under the <i>Species at Risk Act</i>
2012	The federal government released the: <i>Recovery Strategy for the Woodland Caribou Boreal Population in Canada</i>
2014	The Saskatchewan Ministry of Environment released the: <i>Conservation Strategy for Boreal Woodland Caribou</i>
2017	The federal government released the <i>Action Plan for the Woodland Caribou (<u>Rangifer tarandus caribou</u>), Boreal Population, in Canada - Federal Actions</i>
2017 2019	The Saskatchewan Ministry of Environment released the draft and final <i>Range Plan(s) for Woodland Caribou in Saskatchewan – Boreal Plain Ecozone – SK2 Central</i>
2019 2021	The Saskatchewan Ministry of Environment released the draft and final <i>Range Plan(s) for Woodland Caribou in Saskatchewan – Boreal Plain Ecozone – SK2 West</i>
2021	The Saskatchewan Ministry of Environment released the draft <i>Range Plan for Woodland Caribou in Saskatchewan – Boreal Plain Ecozone – SK2 East</i>



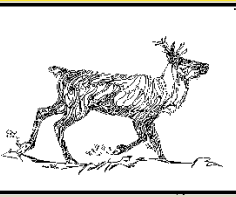
The Goal of the Range Plan



- To achieve and maintain a **self-sustaining** woodland caribou population by managing **habitat** availability, while allowing for continued economic activity.



Range Plan Development Process



- Range plans are developed through:

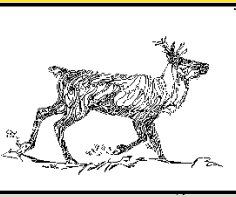
Range Assessment



Range Planning



Range Assessment & Range Planning



- Recognizes the variation of:
 - i. Fire regimes,
 - ii. Ecological conditions,
 - iii. Land-use activity, and
 - iv. Human-caused disturbance across the boreal forest.



&



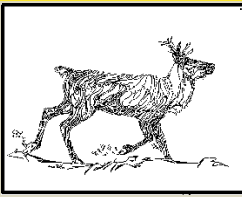
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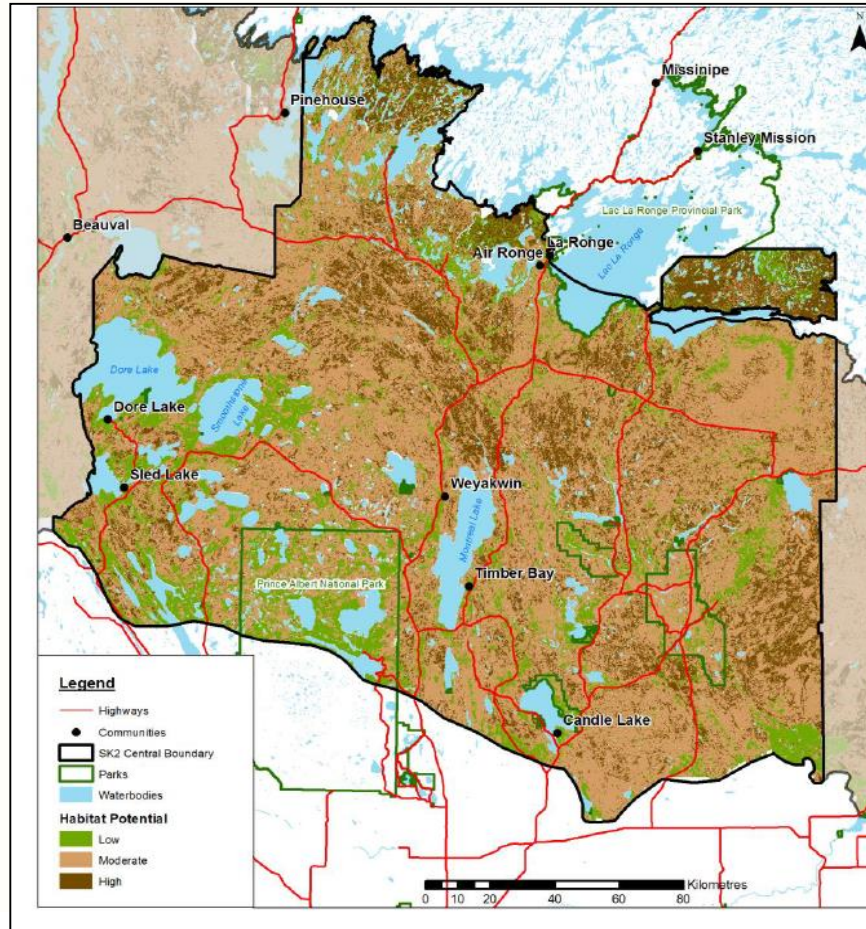
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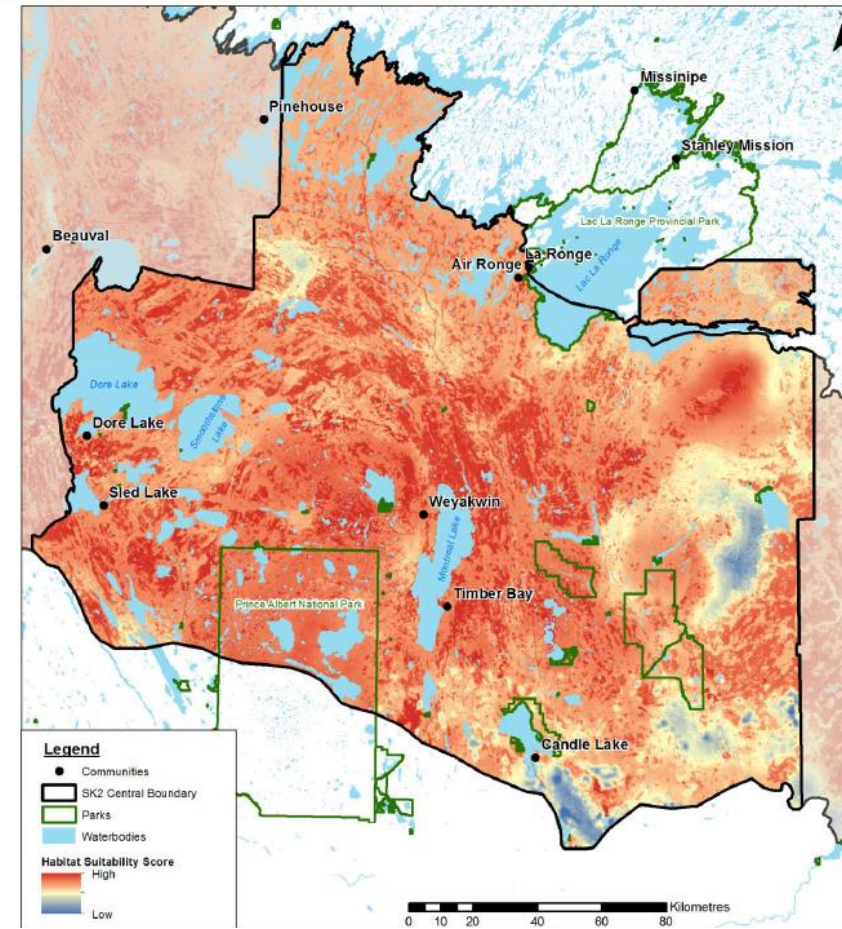
Process - Range Assessment (e.g., SK2 Central)



i. Habitat potential

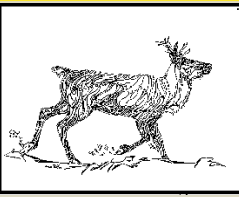


Caribou habitat potential from ecosites

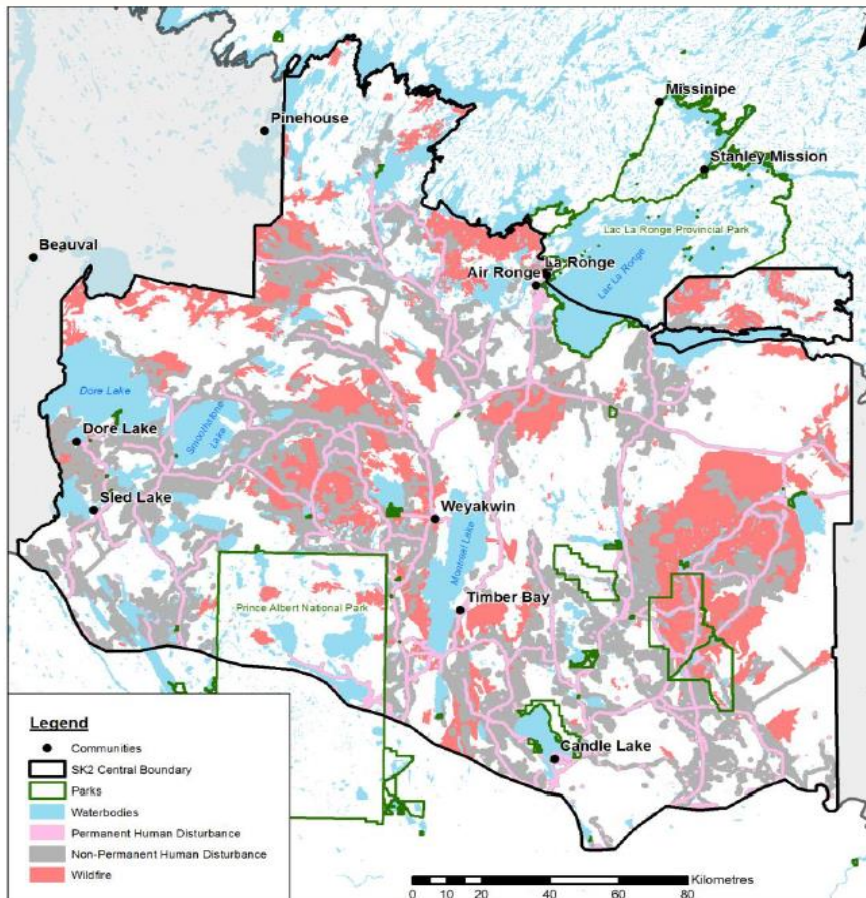
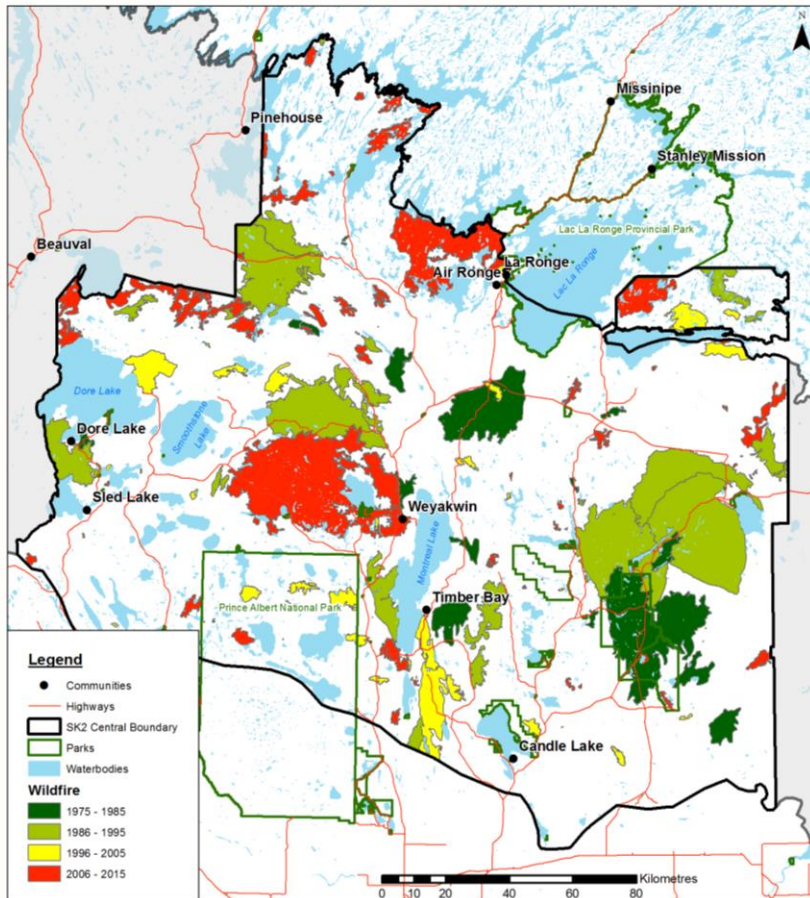


Habitat suitability from Indigenous knowledge

Process – Range Assessment

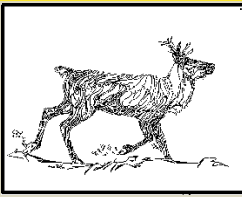


ii. Levels of natural & human disturbance (e.g., SK2 Central)

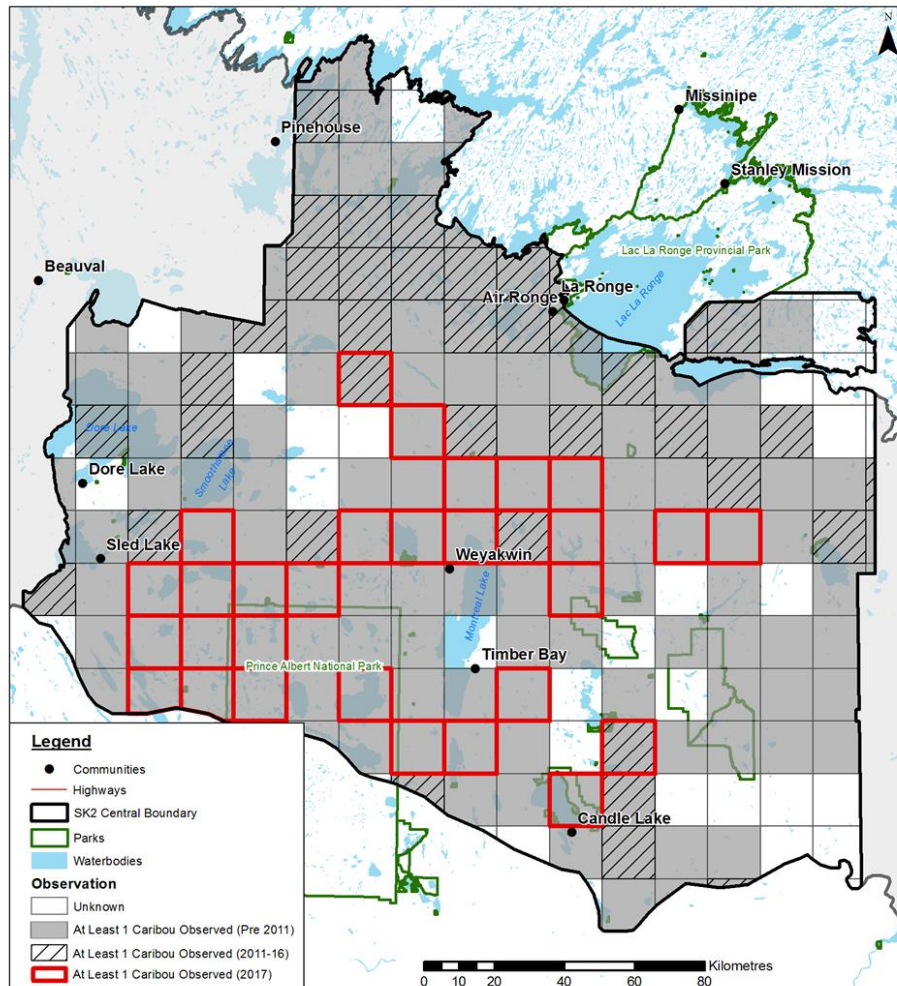


Type of Disturbance	Percent of Area
Human caused	28 %
Wildfire	15 %
TOTAL	43 %
Undisturbed	57 % target = 65%

Process – Range Assessment (e.g., SK2 Central)



iii. Caribou occupancy



- Based on caribou sightings and telemetry over several decades.
- Observed caribou presence over time.
- Blank spots don't mean no caribou, just not reported.
- Map shows caribou widespread* through the central Boreal Plain (SK2 Central).

* But not necessarily self-sustaining

Habitat + Caribou Use + Disturbance*** = Caribou Habitat Management Areas (CHMA)

CHMA Category	Criteria for Selection
Tier 1	Areas of high-moderate caribou habitat potential with high levels of long-term and current caribou use and low levels of human-caused disturbance.
Tier 2	Areas of high-moderate caribou habitat potential with observed caribou use and high levels of wildfire and human-caused disturbance.
Tier 3	Areas of general caribou habitat between that provide connectivity between Tier 1 and Tier 2 areas.

Management objectives were identified for each tier based on:

- use by caribou;
- habitat condition,
- potential risks, and
- other factors.

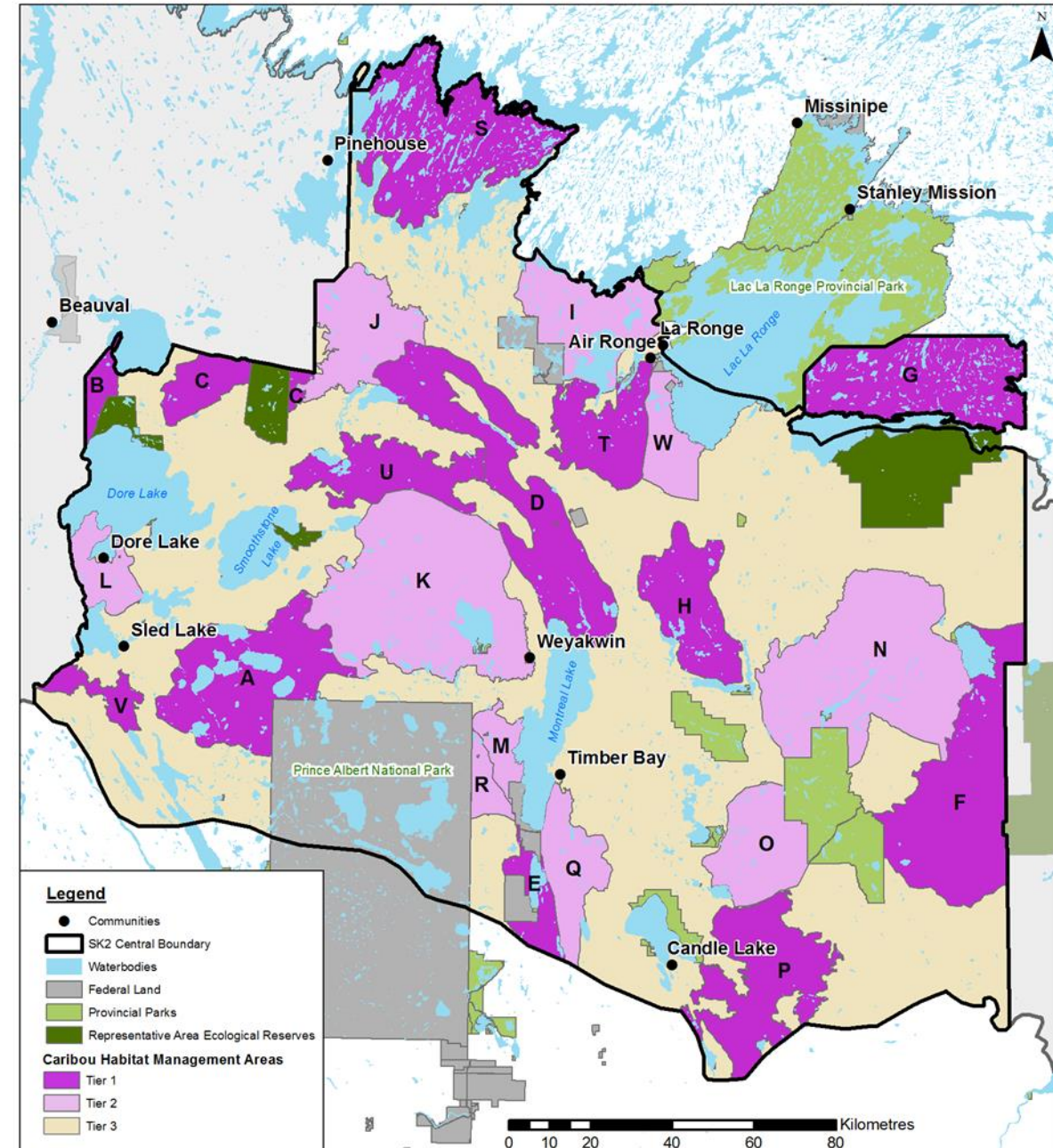
*** + other factors

Caribou Habitat Management Area Tiers

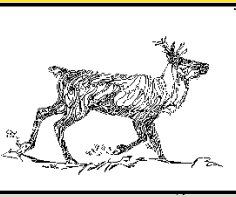
- **Tier 1** represents some areas of high importance where caribou habitat retention is the primary objective.
- **Tier 2** areas are of importance to caribou, but have higher levels of habitat disturbance and are with an objective of habitat restoration.
- **Tier 3** areas represent general matrix caribou habitat where maintaining connectivity is an important objective.

E.g., SK2 Central Caribou Administrative Unit

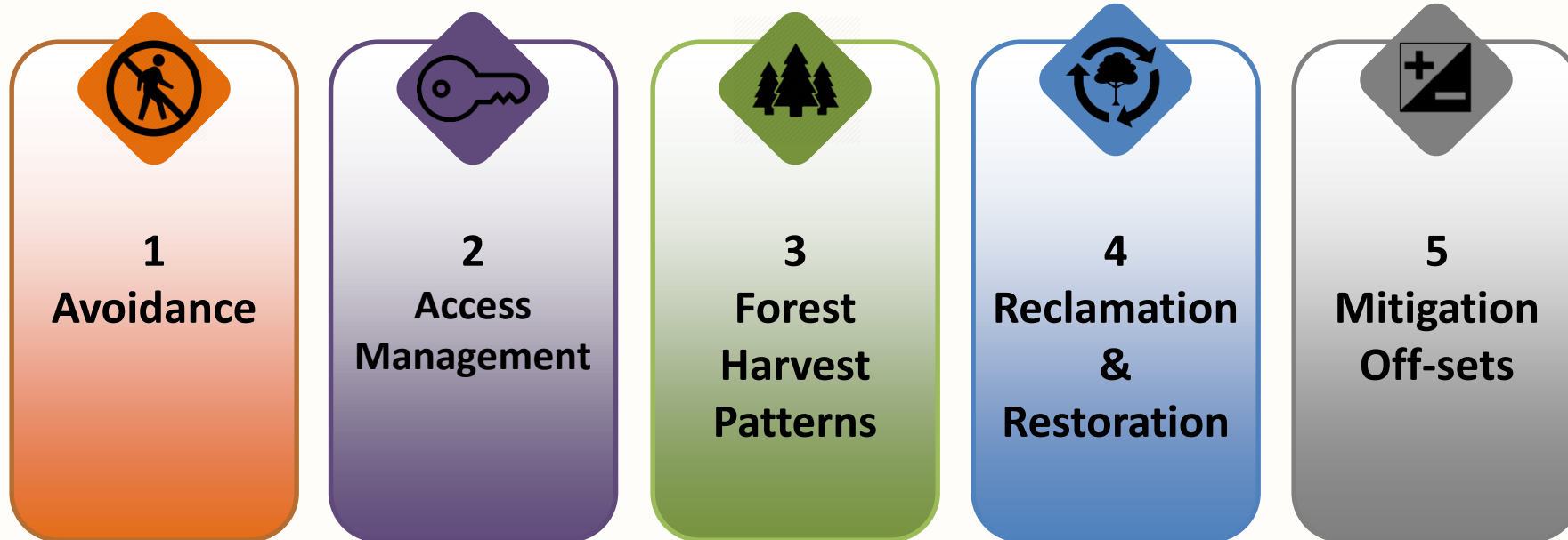
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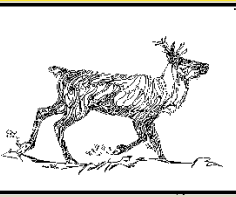
Process - Range Planning



i. Management objectives & strategies



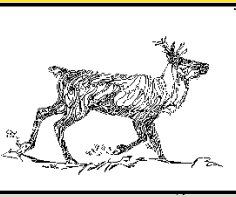
Strategy 1 - Avoidance



- Purposeful planning and avoidance of important caribou habitat will aid in locating new developments away from high value caribou areas.
- Avoidance of important caribou habitat during the sensitive late-winter, calving and post-calving time periods (April 1 to July 31) should also be considered by all land users to minimize sensory disturbance.



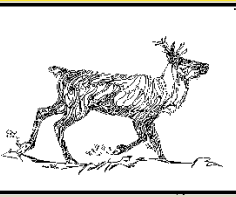
Strategy 2 - Access Management



- Access management will be applied strategically to maximize disturbance recovery and habitat connectivity.
- Planning will be carried out with the input of local users, and will include public education.
- Linear features suitable for reclamation will be identified.



Strategy 3 - Naturalize Forest Harvest Patterns



- Saskatchewan forests are adapted to wildfire. Wildfire is the dominant natural agent of both disturbance and renewal.
- Forest harvesting and post-harvest reforestation can be made to more closely represent these natural landscape patterns.



Traditional Forest Harvest



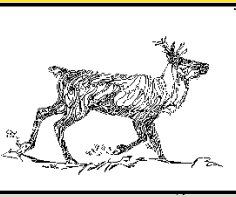
Small harvest blocks with many forestry roads = highly fragmented habitat and greater footprint

Natural Forest Pattern Harvest

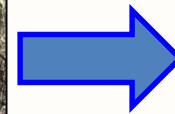
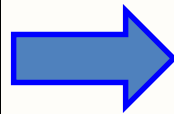


Same volume harvested: larger harvest blocks and fewer forestry roads = less habitat fragmentation and smaller footprint

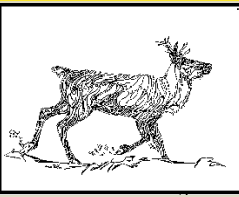
Strategy 4 - Reclamation and Restoration



- The intent is to return disturbed areas to functional habitat.
- Linear features are responsible for the majority of human-caused disturbance in the central Boreal Plain.
- Reclamation and restoration of linear and area-based disturbance is necessary to maintain a sufficient extent and connectivity of caribou habitat across the landscape.



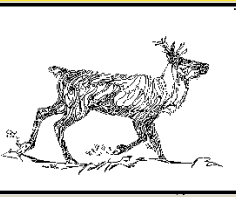
Strategy 5 – Mitigation Off-Sets



- Mitigation is about reducing the negative consequences associated with developments.
- The intent is to maintain or reduce levels of human-caused habitat disturbance by compensating with restoration of areas outside of the immediately planned disturbance.
- Habitat of higher importance for caribou will require greater offsets.



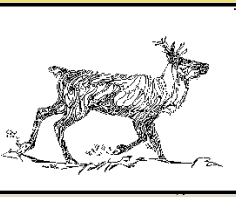
Process - Range Planning



- Monitoring
 1. Population trends,
 2. Habitat condition,
 3. Protection measures, and
 4. Range plan implementation.



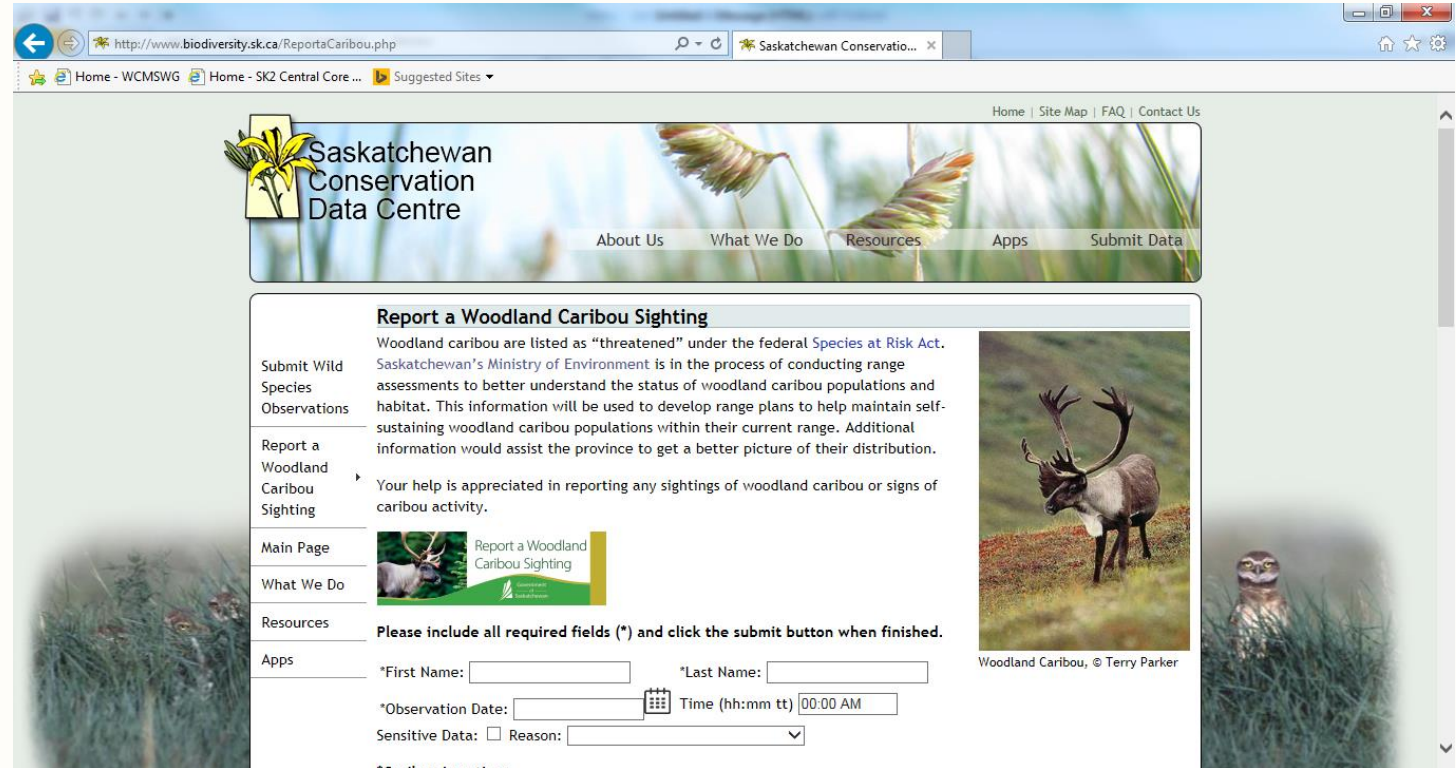
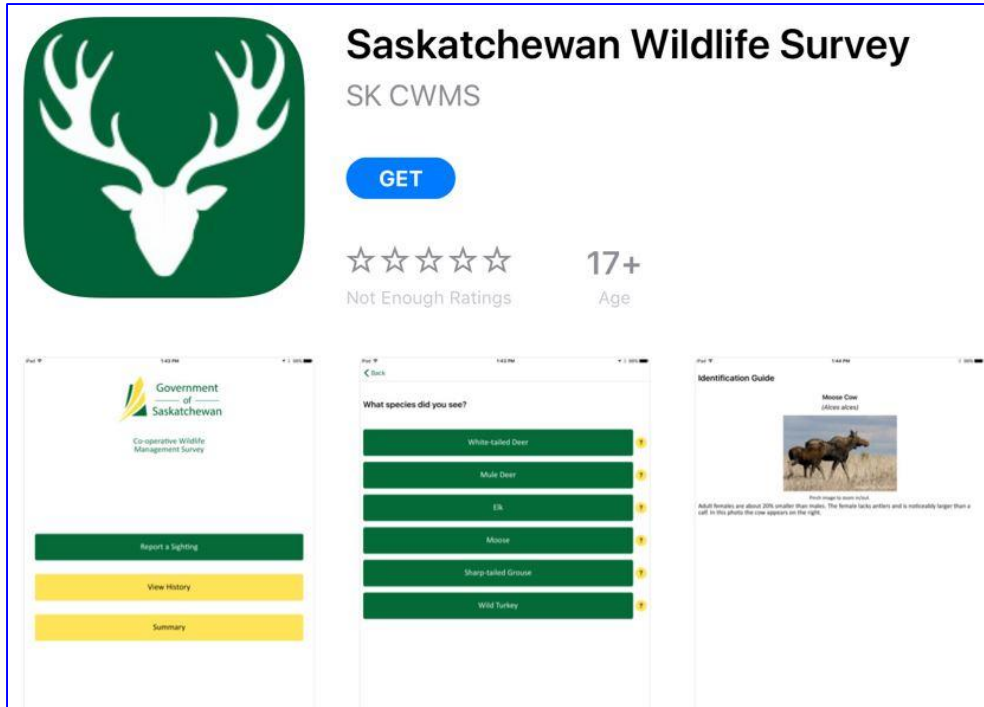
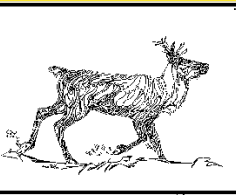
Events that Trigger Plan Review + Revision + Update



- Range plans are scheduled for update:
- Following population and habitat condition monitoring or more frequently:
 - As new information about caribou or their habitat becomes available, or
 - Following substantial landscape disturbances that exceed the norm.

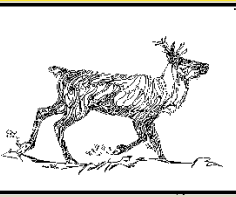


Report-a-Caribou



<http://www.biodiversity.sk.ca/ReportaCaribou.php>

End – Thank-You



For more resources, fact sheets, population trends, program updates:
<https://www.saskatchewan.ca/business/environmental-protection-and-sustainability/wildlife-and-conservation/wildlife-species-at-risk/woodland-caribou>

Important Addresses

<http://www.biodiversity.sk.ca/ReportaCaribou.php>

woodlandcaribouproject@gov.sk.ca

<https://www.saskatchewan.ca/government/public-consultations/woodland-caribou-range-plan>

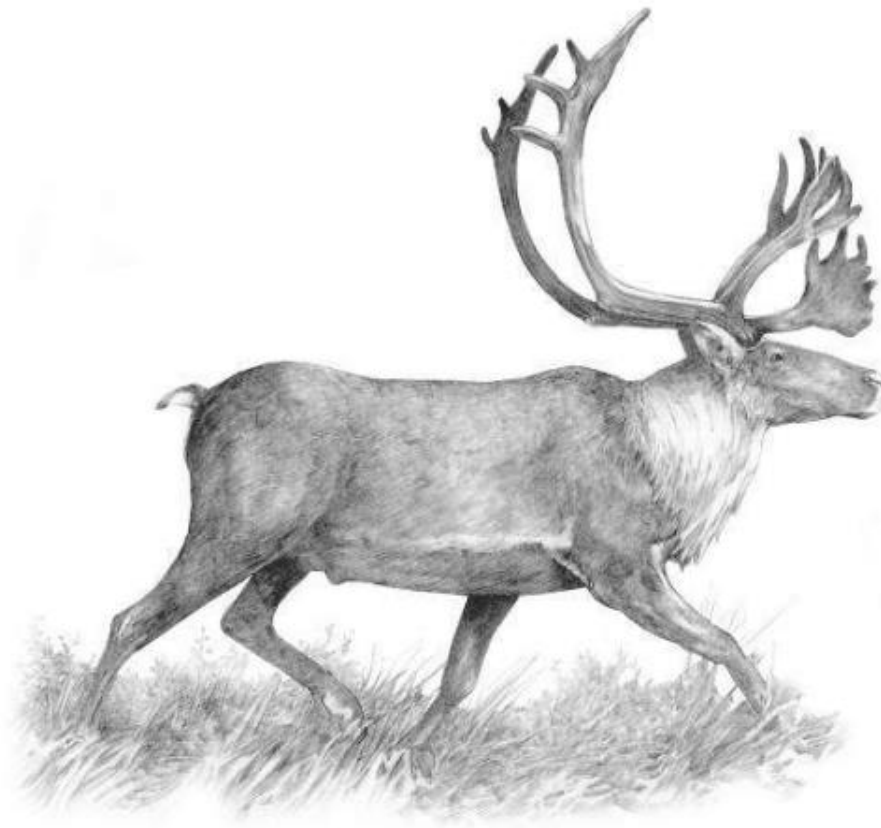


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