

Critical Habitat Identification: Northwest Territories North (Northwest Territories)

The identification of critical habitat for boreal caribou is described by three factors for each local population: i) Location of habitat; ii) Amount of habitat; and iii) Type of habitat.

A) **Location:** Where critical habitat is found.



Figure 1: Keymap of the general location of the local population (in red).

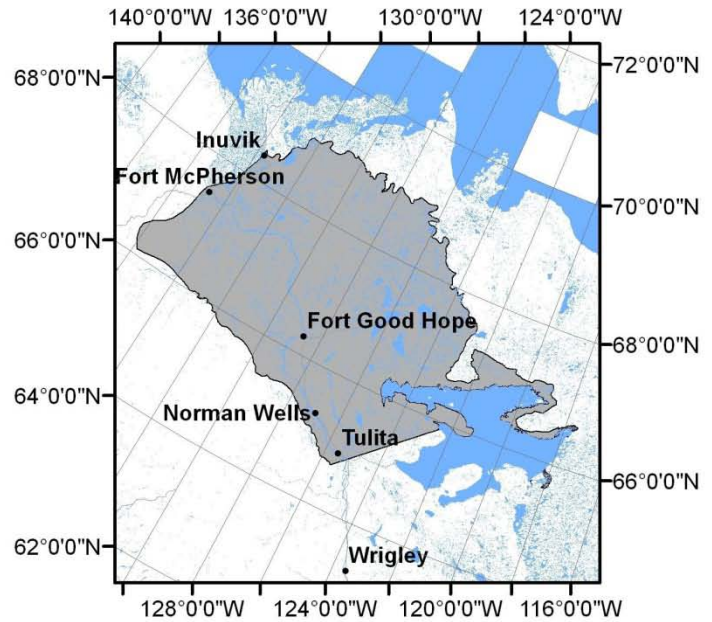


Figure 2: The geographic boundary within which critical habitat is located (in grey).

B) **Amount:** Quantity of critical habitat.

Table 1: Range Attributes and the Amount of Habitat Required

Range Attributes	Range Size	19,154,033 ha
	Population size	Unknown
	Population trend	unknown
	Total Habitat Disturbance	4,213,887 ha
Range Assessment	Assessment of the likelihood of the current condition of the range to support a self-sustaining local population	Self-Sustaining
Determination of Amount of Critical Habitat	A) Range Size	19,154,033 ha (100%)
	B) Total Habitat Disturbance ¹	4,213,887 ha (22%)
	C) Critical Habitat ²	12,450,121 ha (65%)

¹ Total Habitat Disturbance reflects loss of functional habitat. It will be more than the associated disturbance footprint (e.g. 100 ha footprint could lead to 400 ha loss of functional habitat).

² The available undisturbed habitat is more than 65% of the range.

Critical Habitat Identification: Northwest Territories North (Northwest Territories)

C) **Type:** Biophysical attributes.

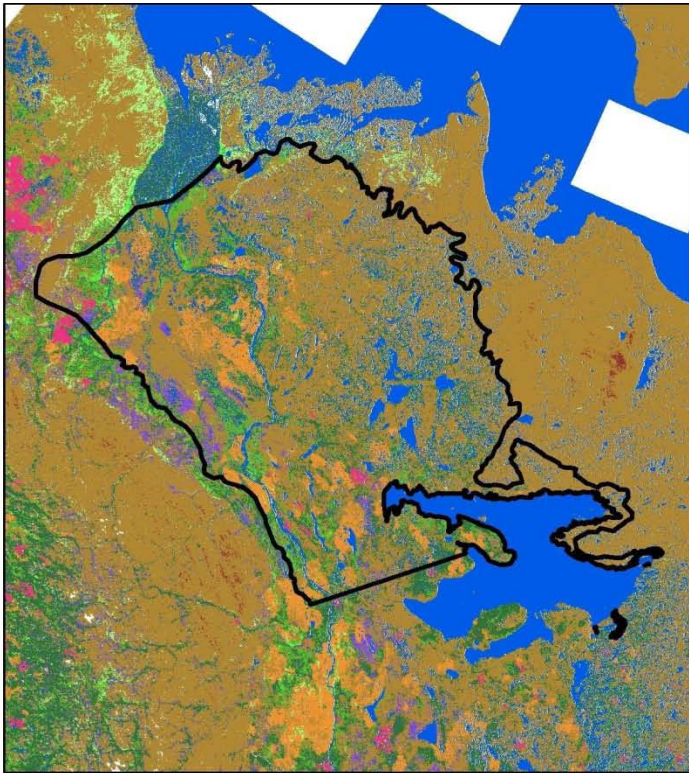
Table 1: Biophysical attributes of boreal caribou habitat in the Taiga Plains ecozone.

Type of selection	
Broad scale	Mature forests (jack pine, spruce, tamarack) of 100 years or older, and open coniferous habitat. Large areas of spruce peatland and muskeg with preference for bogs over fens and upland and lowland black spruce forests with abundant lichens and sedge and moss availability. Flatter areas with smaller trees and willows, hills and higher ground.
Calving	Open coniferous forests, tussock tundra, low shrub, riparian, recent burned areas, south and west aspects and Hills and higher locations. Muskegs, marshes, staying close to water sources. Caribou observed on small islands of mature black spruce or mixed forests within peatlands, in old burns at the edge of wetlands, in alder thickets with abundant standing water and on lake shores.
Post-calving	Muskegs or areas with access to muskegs, open meadows on higher ground, close to water (lakes and rivers) and mixed bush areas. Open coniferous forests with abundant lichens, low shrub, riparian, tussock tundra, sparsely vegetative habitat, recent burns and west aspects. Old burns and neighbouring remnant unburned forests selected in late spring and early summer.
Rutting	Open coniferous and mixedwood forests, low shrub, riparian, tussock tundra, recent burns and west aspect. Still use muskegs that harbor ground lichen and sedges, mixed bush areas, areas of higher ground. Regenerating burns and sparsely vegetated habitat.
Winter	Open coniferous forests (black spruce and pine) that provide adequate cover with abundant lichens, riparian areas. Caribou observed in muskeg areas in early winter. Spruce-lichen forests, fire regenerated, sparsely vegetated habitat, herbaceous and tall shrub habitat and sphagnum moss with scattered spruce. As snow depth increases, they remain more often in areas of dense pine or thickly wooded black spruce, with hanging lichen and remains access to open, mixed vegetation for ground forage.
Travel	Females show high fidelity to calving sites among years (i.e. within 14.5 km). Many caribou shift the pattern of use based on seasonal preferences, in large multi-habitat areas. Rates of movement increase during the rut and are greatest in winter.
Avoidance	Avoid edge habitat. Avoid closed mixed forests, and water during calving. Avoid closed deciduous and mixed forest in summer, fall. Closed coniferous forests may be avoided in winter but are used as snow accumulates. Caribou may avoid water in the fall, although there are reports that they are seen along or crossing water bodies. Avoid forest stand < 10 yrs old during summer. Avoid roads (including winter roads), cutlines and open bog areas. Do not frequent burned areas in the mid- to late winter even as travel corridors. Avoid lower and wetter muskeg areas in mid to late winter.

A small portion of boreal caribou habitat in the Northwest Territories northern range falls within the Southern Arctic ecozone and the Taiga Cordillera ecozone. Currently, there is no information available on boreal caribou habitat use or biophysical attributes in either of these ecozones. Biophysical attributes in the Taiga Plains ecozone will be used to describe the type of habitat needed for the identification of critical habitat for boreal caribou in the Southern Arctic and Taiga Cordillera ecozones.

Critical Habitat Identification: Northwest Territories North (Northwest Territories)

D) Additional Information:

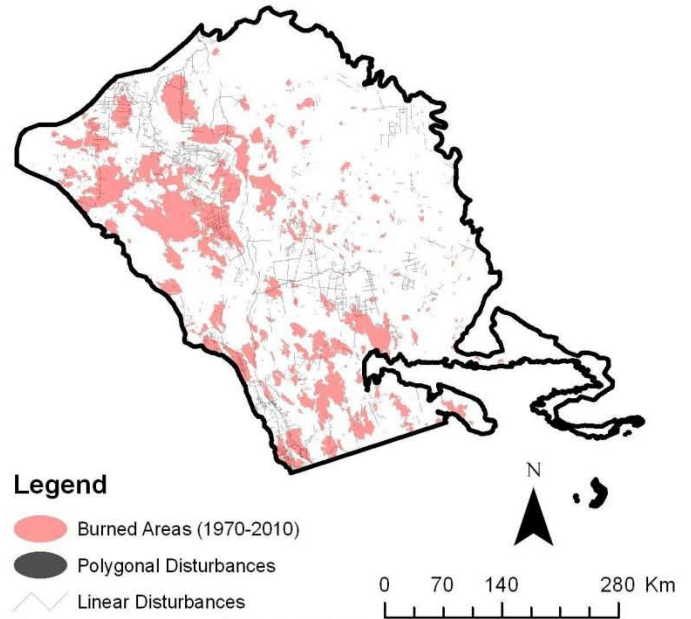


Landcover

- | | | |
|-------------------|------------|--------------|
| Water | Shrub | Rock Outcrop |
| Coniferous Forest | Herbaceous | Recent Burn |
| Deciduous Forest | Wetland | Old Burn |
| Mixed Forest | Cropland | Built-Up |

MODIS 2005 Landcover (250m Pixels) (Generated by CCRS)
 (Legend reclassified by EC)
 With NTDB 1:250,000 Hydrology Layer

Disturbances Across Caribou Range



Legend

- Burned Areas (1970-2010)
- Polygonal Disturbances
- Linear Disturbances

*Based on fire data provided by jurisdictions

Disturbance Type and Amount:

Burned Areas = 18%

Buffered³ Anthropogenic (no reservoirs) = 5%

Total Habitat Disturbance = 22%⁴

³ Buffered means a 500m buffer is applied to linear and polygonal disturbances.

⁴ Total Habitat Disturbance is non-overlapping which means anthropogenic disturbances and burned areas that overlap are not counted twice in the total.

Critical Habitat Identification: Suggi-Amisk-Kississing (Saskatchewan)

The identification of critical habitat for boreal caribou is described by three factors for each local population: i) Location of habitat; ii) Amount of habitat; and iii) Type of habitat.

A) **Location:** Where critical habitat is found.

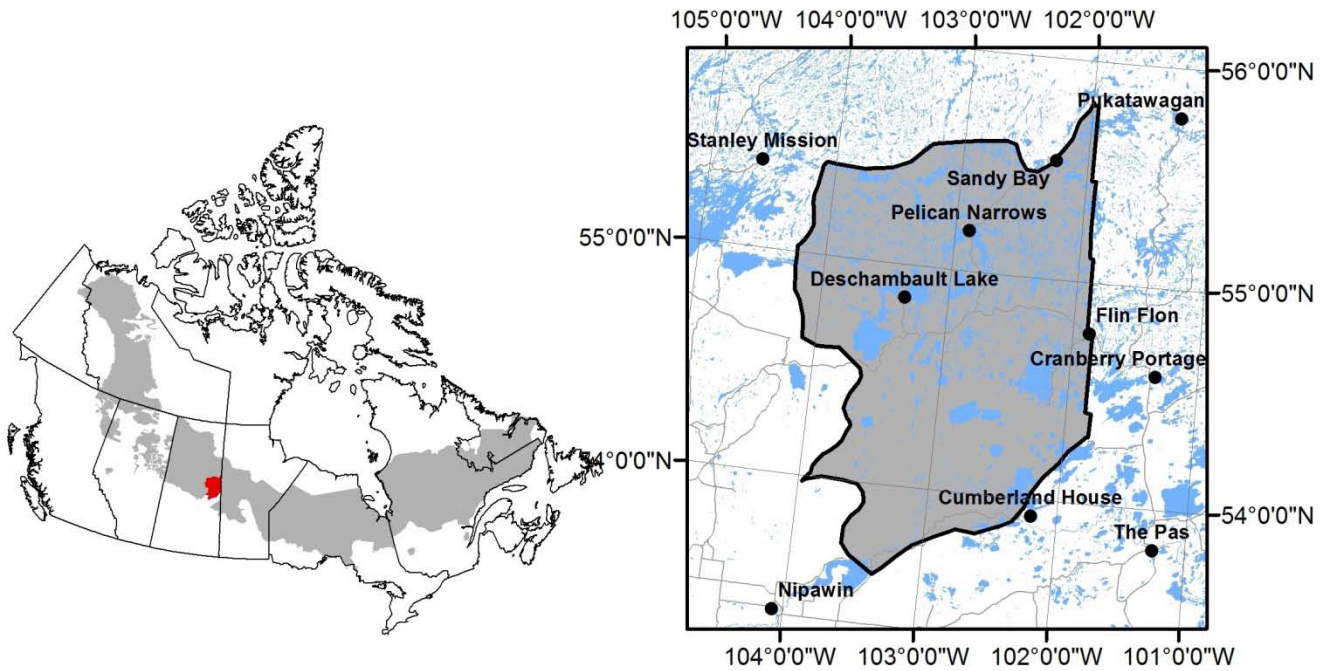


Figure 1: Keymap of the general location of the local population (in red).

Figure 2: The geographic boundary within which critical habitat is located (in grey).

B) **Amount:** Quantity of critical habitat.

Table 1: Range Attributes and the Amount of Habitat Required

Range Attributes	Range Size	2,487,894 ha
	Population size	430
	Population trend	Unknown
	Total Habitat Disturbance	621,974 ha
Range Assessment	Assessment of the current condition of the range to support a self-sustaining local population	Self-Sustaining
Determination of Amount of Habitat	A) Range Size	2,487,894 ha (100%)
	B) Total Habitat Disturbance ¹	621,974 ha (25%)
	C) Critical Habitat ²	1,617,131 ha (65%)

¹ Total Habitat Disturbance reflects loss of functional habitat. It will be more than the associated disturbance footprint (e.g. 100 ha footprint could lead to 400 ha loss of functional habitat).

² The available undisturbed habitat is more than 65% of the range.

Critical Habitat Identification: Suggi-Amisk-Kississing (Saskatchewan)

C) **Type:** Biophysical attributes.

Table 1: Biophysical attributes of boreal caribou habitat in the Boreal Shield West ecozone.

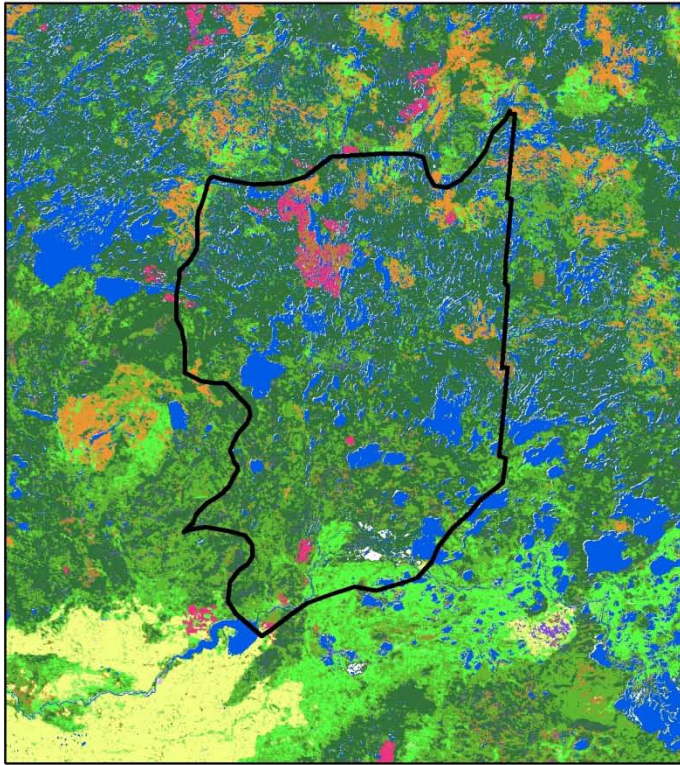
Type of selection	Description
Broad scale	Conifer/tamarack-dominated peatland complexes, muskegs or bogs, use dry islands in the middle of muskegs and upland moderate to dense mature conifer forests (jack pine, black spruce, tamarack) with abundant lichens. Hilly or higher ground, lots of smaller lakes in area.
Calving	Peatlands, stands dominated by black spruce, mature forest stands and treed muskeg all used for calving. Caribou will use islands, small lakes, lakeshores during calving.
Post-calving	Wooded lakeshores, islands, sparsely treed rock, upland conifer-spruce and treed muskeg are used in summer. Sites with a high abundance of arboreal lichen are important for foraging in some areas. Dense conifer and mixed forest are also used.
Rutting	Dense and sparse conifer and mixed forests. Open riparian habitats are also used during the rut.
Winter	Mature upland spruce, pine stands and treed muskeg. Jack pine dominated forests. Caribou select sparse and dense conifer, mixed forests and treed bogs. In some areas caribou will select habitat with greater visibility and further away from forest edges.
Travel	Some males move > 100 km during the rutting season. Traditional travel routes between summer and winter ranges occur in large peatland complexes. Caribou migrate in a north to south pattern.
Avoidance	Avoid shrub-rich habitats and hardwood-dominated stands. Avoidance of conifer stands that are not black spruce, deciduous stands, shrub-rich fens and wetlands during calving. Avoid recent burns and disturbed/fragmented areas, including roads.

Table 2: Biophysical attributes of boreal caribou habitat in the Boreal Plains ecozone.

Type of selection	Description
Broad scale	Late seral-stage (> 50 yrs old) conifer forest (jack pine, black spruce, tamarack), treed peatlands, muskegs or bogs, use dry islands in the middle of muskegs, with abundant lichens. Hilly or higher ground and small lakes. Restricted primarily to peatland complexes. Elevations of 1135 m. Selected old (>40 yrs) burns.
Calving	Bogs and mature forests selected for calving as well as islands and small lakes. Peatlands and stands dominated by black spruce and lowland black spruce stands within muskeg are used for calving.
Post-calving	Forest stands older than 50 yrs. Upland black spruce/jack pine forests, lowland black spruce, young jack pine and open and treed peatlands and muskeg are also selected during summer. Use lichen and low muskeg vegetation. In some areas, sites with abundant arboreal lichen are selected during summer.
Rutting	Mature forests. Upland black spruce/jack pine forests, lowland black spruce, young jack pine and open and treed peatlands and muskeg during summer.
Winter	Treed peatlands, treed bog and treed fen and open fen complexes with > 50% peatland coverage with high abundance of lichens. Use of small lakes, rock outcrops on lakes for lichen access. Mature forest > 50 yrs old. Upland black spruce/jack pine forests, lowland black spruce, young jack pine and open and treed peatlands.
Avoidance	Avoid upland and fen habitats, aspen dominated stands, immature stands and large rivers all year round. Avoid matrix-type habitat, including areas with abundant shrubs, disturbed/fragmented habitats, hardwood/deciduous dominated forest stands, and edge habitat. Avoid recent burns, main roads, seismic lines, well sites and areas with a high density of cut blocks. Avoidance of water.

Critical Habitat Identification: Suggi-Amisk-Kississing (Saskatchewan)

D) Additional Information:

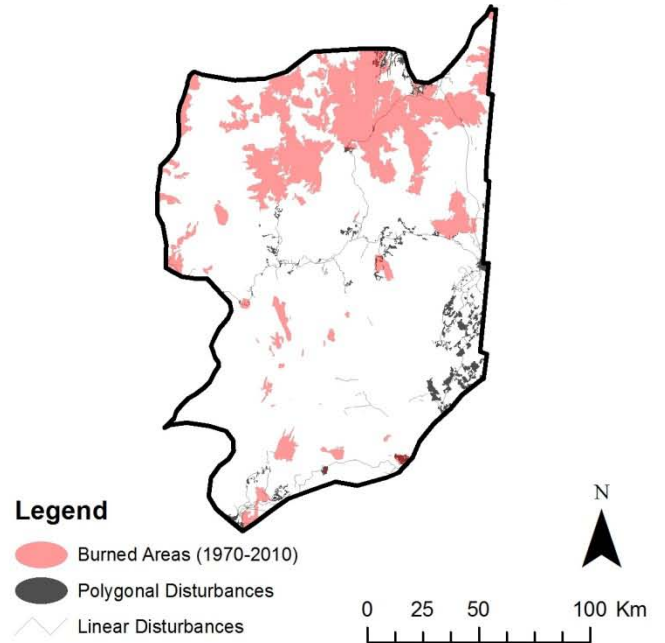


Landcover

- | | | |
|-------------------|------------|--------------|
| Water | Shrub | Rock Outcrop |
| Coniferous Forest | Herbaceous | Recent Burn |
| Deciduous Forest | Wetland | Old Burn |
| Mixed Forest | Cropland | Built-Up |

MODIS 2005 Landcover (250m Pixels) (Generated by CCRS)
 Legend reclassified by EC
 With NTDB 1:250,000 Hydrology Layer

Disturbances Across Caribou Range



*Based on fire data provided by jurisdictions

Disturbance Type and Amount:

- Burned Areas = 18%
- Buffered⁴ Anthropogenic (no reservoirs) = 8%
- Total Habitat Disturbance = 25%⁵

⁴ Buffered means a 500m buffer is applied to linear and polygonal disturbances.
⁵ Total Habitat Disturbance is non-overlapping which means anthropogenic disturbances and burned areas that overlap are not counted twice in the total.

Critical Habitat Identification: Reed (Manitoba)

The identification of critical habitat for boreal caribou is described by three factors for each local population: i) Location of habitat; ii) Amount of habitat; and iii) Type of habitat.

A) **Location:** Where critical habitat is found.

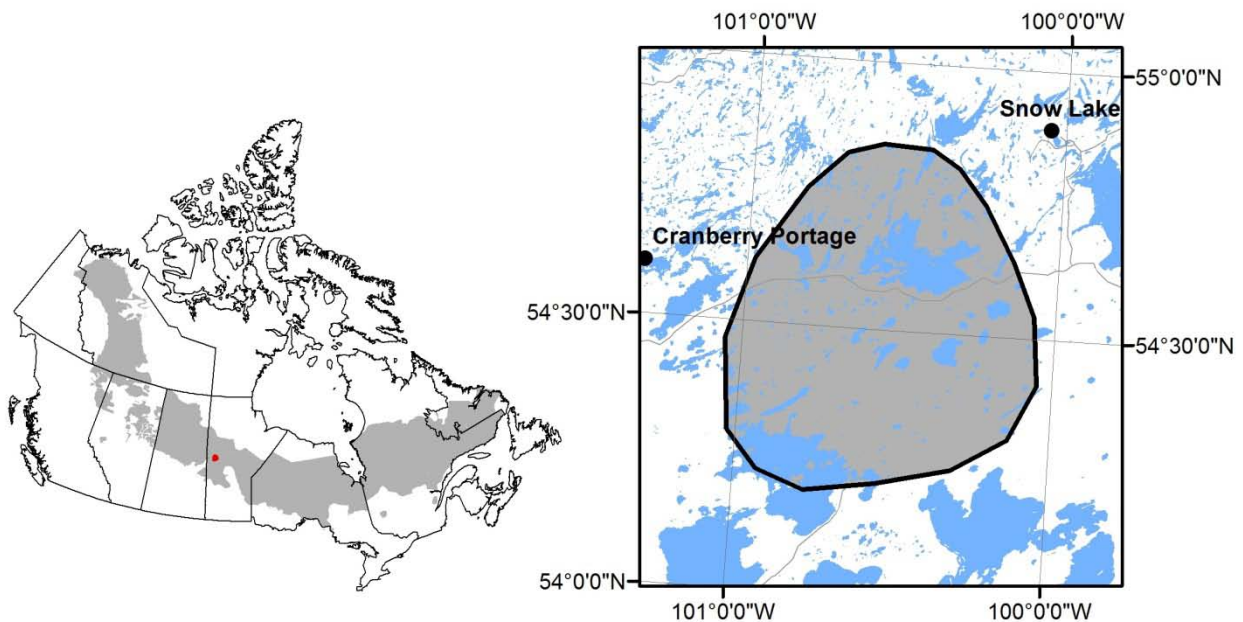


Figure 1: Keymap of the general location of the local population (in red).

Figure 2: The geographic boundary within which critical habitat is located (in grey).

B) **Amount:** Quantity of critical habitat.

Table 1: Range Attributes and the Amount of Habitat Required

Range Attributes	Range Size	357,425 ha
	Population size	100-150
	Population trend	Stable
	Total Habitat Disturbance	92,931 ha
Range Assessment	Assessment of the current condition of the range to support a self-sustaining local population	Self-Sustaining
Determination of Amount of Habitat	A) Range Size	357,425 ha (100%)
	B) Total Habitat Disturbance ¹	92,931 ha (26%)
	C) Critical Habitat ²	232,326 ha (65%)

¹ Total Habitat Disturbance reflects loss of functional habitat. It will be more than the associated disturbance footprint (e.g. 100 ha footprint could lead to 400 ha loss of functional habitat).

² The available undisturbed habitat is more than 65% of the range.

Critical Habitat Identification: Reed (Manitoba)

C) **Type:** Biophysical attributes.

Table 1: Biophysical attributes of boreal caribou habitat in the Boreal Shield West ecozone.

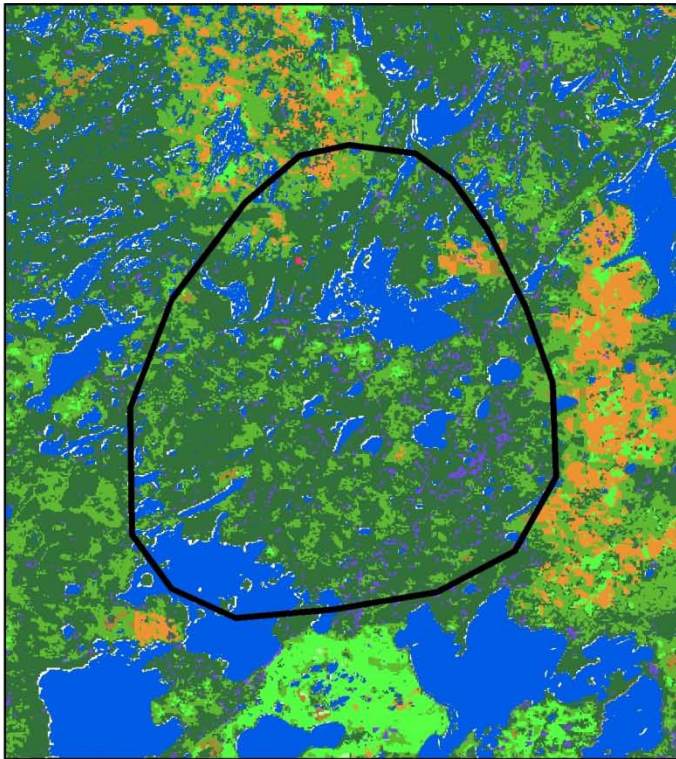
Type of selection	Description
Broad scale	Conifer/tamarack-dominated peatland complexes, muskegs or bogs, use dry islands in the middle of muskegs and upland moderate to dense mature conifer forests (jack pine, black spruce, tamarack) with abundant lichens. Hilly or higher ground, lots of smaller lakes in area.
Calving	Peatlands, stands dominated by black spruce, mature forest stands and treed muskeg all used for calving. Caribou will use islands, small lakes, lakeshores during calving.
Post-calving	Wooded lakeshores, islands, sparsely treed rock, upland conifer-spruce and treed muskeg are used in summer. Sites with a high abundance of arboreal lichen are important for foraging in some areas. Dense conifer and mixed forest are also used.
Rutting	Dense and sparse conifer and mixed forests. Open riparian habitats are also used during the rut.
Winter	Mature upland spruce, pine stands and treed muskeg. Jack pine dominated forests. Caribou select sparse and dense conifer, mixed forests and treed bogs. In some areas caribou will select habitat with greater visibility and further away from forest edges.
Travel	Some males move > 100 km during the rutting season. Traditional travel routes between summer and winter ranges occur in large peatland complexes. Caribou migrate in a north to south pattern.
Avoidance	Avoid shrub-rich habitats and hardwood-dominated stands. Avoidance of conifer stands that are not black spruce, deciduous stands, shrub-rich fens and wetlands during calving. Avoid recent burns and disturbed/fragmented areas, including roads.

Table 2: Biophysical attributes of boreal caribou habitat in the Boreal Plains ecozone.

Type of selection	Description
Broad scale	Late seral-stage (> 50 yrs old) conifer forest (jack pine, black spruce, tamarack), treed peatlands, muskegs or bogs, use dry islands in the middle of muskegs, with abundant lichens. Hilly or higher ground and small lakes. Restricted primarily to peatland complexes. Elevations of 1135 m. Selected old (>40 yrs) burns.
Calving	Bogs and mature forests selected for calving as well as islands and small lakes. Peatlands and stands dominated by black spruce and lowland black spruce stands within muskeg are used for calving.
Post-calving	Forest stands older than 50 yrs. Upland black spruce/jack pine forests, lowland black spruce, young jack pine and open and treed peatlands and muskeg are also selected during summer. Use lichen and low muskeg vegetation. In some areas, sites with abundant arboreal lichen are selected during summer.
Rutting	Mature forests. Upland black spruce/jack pine forests, lowland black spruce, young jack pine and open and treed peatlands and muskeg during summer.
Winter	Treed peatlands, treed bog and treed fen and open fen complexes with > 50% peatland coverage with high abundance of lichens. Use of small lakes, rock outcrops on lakes for lichen access. Mature forest > 50 yrs old. Upland black spruce/jack pine forests, lowland black spruce, young jack pine and open and treed peatlands.
Avoidance	Avoid upland and fen habitats, aspen dominated stands, immature stands and large rivers all year round. Avoid matrix-type habitat, including areas with abundant shrubs, disturbed/fragmented habitats, hardwood/deciduous dominated forest stands, and edge habitat. Avoid recent burns, main roads, seismic lines, well sites and areas with a high density of cut blocks. Avoidance of water.

Critical Habitat Identification: Reed (Manitoba)

D) Additional Information:

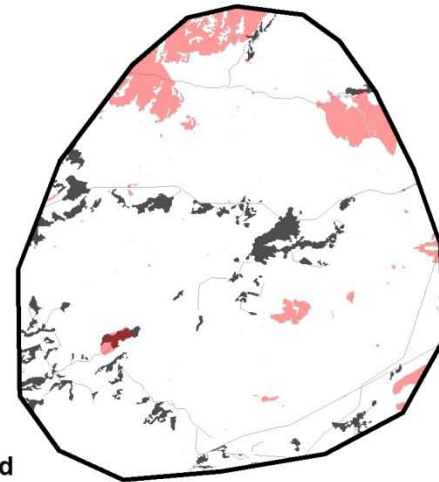


Landcover

- | | | |
|-------------------|------------|--------------|
| Water | Shrub | Rock Outcrop |
| Coniferous Forest | Herbaceous | Recent Burn |
| Deciduous Forest | Wetland | Old Burn |
| Mixed Forest | Cropland | Built-Up |

MODIS 2005 Landcover (250m Pixels) (Generated by CCRS)
 Legend reclassified by EC
 With NTDB 1:250,000 Hydrology Layer

Disturbances Across Caribou Range



Legend

- Burned Areas (1970-2010)
- Polygonal Disturbances
- Linear Disturbances

*Based on fire data provided by jurisdictions

Disturbance Type and Amount:

Burned Areas = 7%

Buffered⁴ Anthropogenic (no reservoirs) = 20%

Total Habitat Disturbance = 26%⁵

⁴ Buffered means a 500m buffer is applied to linear and polygonal disturbances.

⁵ Total Habitat Disturbance is non-overlapping which means anthropogenic disturbances and burned areas that overlap are not counted twice in the total.

Critical Habitat Identification: Wabowden (Manitoba)

The identification of critical habitat for boreal caribou is described by three factors for each local population: i) Location of habitat; ii) Amount of habitat; and iii) Type of habitat.

A) **Location:** Where critical habitat is found.



Figure 1: Keymap of the general location of the local population (in red).

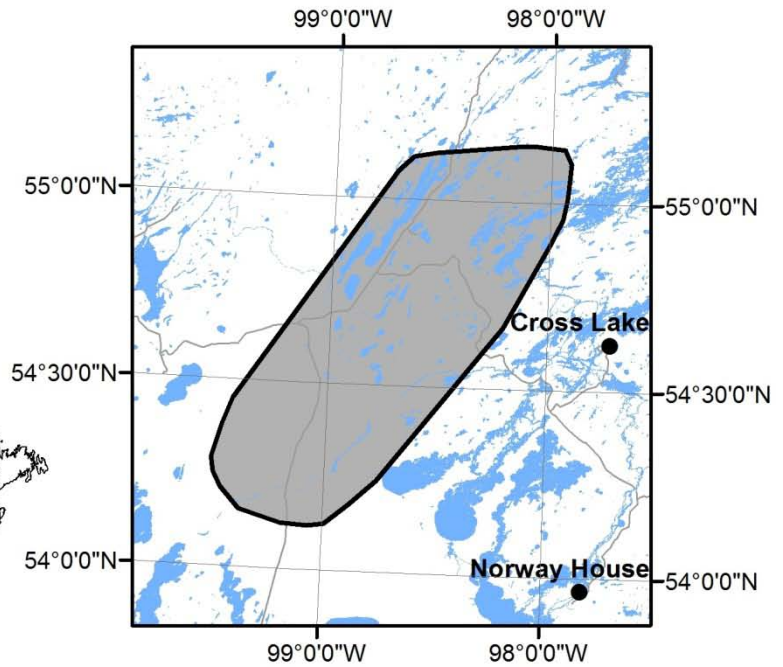


Figure 2: The geographic boundary within which critical habitat is located (in grey).

B) **Amount:** Quantity of critical habitat.

Table 1: Range Attributes and the Amount of Habitat Required

Range Attributes	Range Size	628,938 ha
	Population size	200-225
	Population trend	Stable
	Total Habitat Disturbance	176,103 ha
Range Assessment	Assessment of the current condition of the range to support a self-sustaining local population	Self-Sustaining
Determination of Amount of Habitat	A) Range Size	628,938 ha (100%)
	B) Total Habitat Disturbance ¹	176,103 ha (28%)
	C) Critical Habitat ²	408,810ha (65%)

¹ Total Habitat Disturbance reflects loss of functional habitat. It will be more than the associated disturbance footprint (e.g. 100 ha footprint could lead to 400 ha loss of functional habitat).

² The available undisturbed habitat is more than 65% of the range.

Critical Habitat Identification: Wabowden (Manitoba)

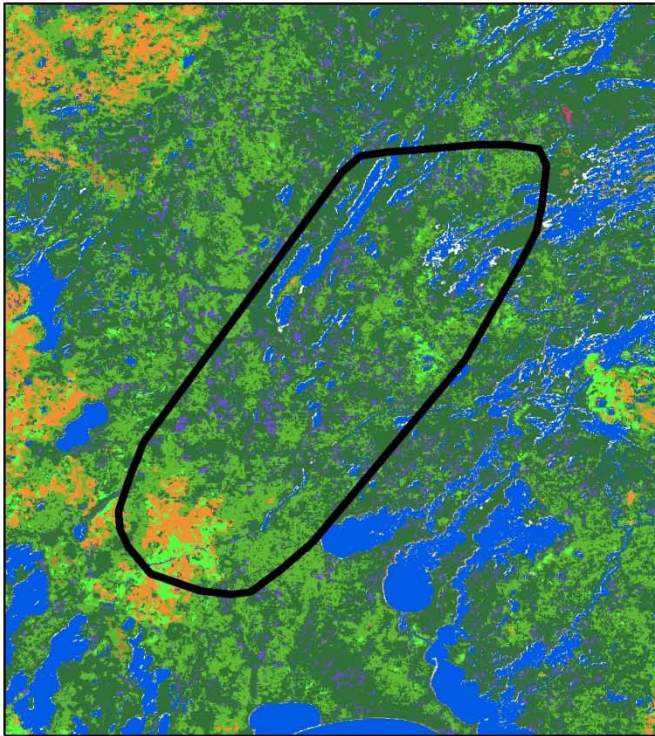
C) **Type:** Biophysical attributes.

Table 1: Biophysical attributes of boreal caribou habitat in the Boreal Plains ecozone.

Type of selection	Description
Broad scale	Late seral-stage (> 50 yrs old) conifer forest (jack pine, black spruce, tamarack), treed peatlands, muskegs or bogs, use dry islands in the middle of muskegs, with abundant lichens. Hilly or higher ground and small lakes. Restricted primarily to peatland complexes. Elevations of 1135 m. Selected old (>40 yrs) burns.
Calving	Bogs and mature forests selected for calving as well as islands and small lakes. Peatlands and stands dominated by black spruce and lowland black spruce stands within muskeg are used for calving.
Post-calving	Forest stands older than 50 yrs. Upland black spruce/jack pine forests, lowland black spruce, young jack pine and open and treed peatlands and muskeg are also selected during summer. Use lichen and low muskeg vegetation. In some areas, sites with abundant arboreal lichen are selected during summer.
Rutting	Mature forests. Upland black spruce/jack pine forests, lowland black spruce, young jack pine and open and treed peatlands and muskeg during summer.
Winter	Treed peatlands, treed bog and treed fen and open fen complexes with > 50% peatland coverage with high abundance of lichens. Use of small lakes, rock outcrops on lakes for lichen access. Mature forest > 50 yrs old. Upland black spruce/jack pine forests, lowland black spruce, young jack pine and open and treed peatlands.
Avoidance	Avoid upland and fen habitats, aspen dominated stands, immature stands and large rivers all year round. Avoid matrix-type habitat, including areas with abundant shrubs, disturbed/fragmented habitats, hardwood/deciduous dominated forest stands, and edge habitat. Avoid recent burns, main roads, seismic lines, well sites and areas with a high density of cut blocks. Avoidance of water.

Critical Habitat Identification: Wabowden (Manitoba)

D) Additional Information:

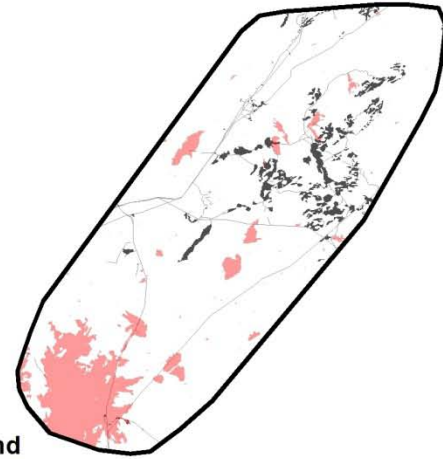


Landcover

- | | | |
|-------------------|------------|--------------|
| Water | Shrub | Rock Outcrop |
| Coniferous Forest | Herbaceous | Recent Burn |
| Deciduous Forest | Wetland | Old Burn |
| Mixed Forest | Cropland | Built-Up |

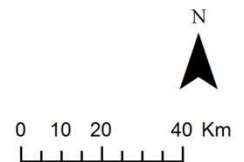
MODIS 2005 Landcover (250m Pixels) (Generated by CCRS)
 Legend reclassified by EC
 With NTDB 1:250,000 Hydrology Layer

Disturbances Across Caribou Range



Legend

- Burned Areas (1970-2010)
- Polygonal Disturbances
- Linear Disturbances



*Based on fire data provided by jurisdictions

Disturbance Type and Amount:

Burned Areas = 10%

Buffered⁴ Anthropogenic (no reservoirs) = 19%

Total Habitat Disturbance = 28%⁵

⁴ Buffered means a 500m buffer is applied to linear and polygonal disturbances.

⁵ Total Habitat Disturbance is non-overlapping which means anthropogenic disturbances and burned areas that overlap are not counted twice in the total.

Critical Habitat Identification: Wapisi (Manitoba)

The identification of critical habitat for boreal caribou is described by three factors for each local population: i) Location of habitat; ii) Amount of habitat; and iii) Type of habitat.

A) **Location:** Where critical habitat is found.



Figure 1: Keymap of the general location of the local population (in red).

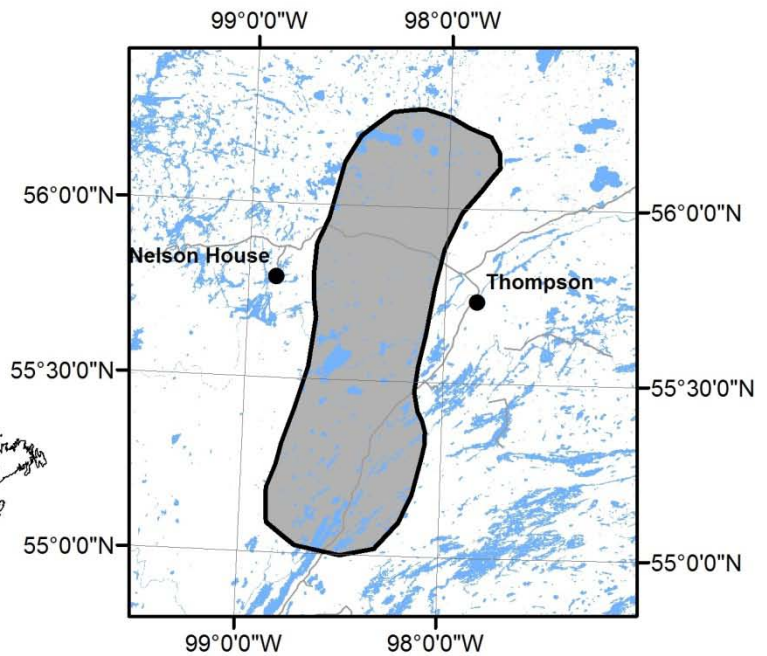


Figure 2: The geographic boundary within which critical habitat is located (in grey).

B) **Amount:** Quantity of critical habitat.

Table 1: Range Attributes and the Amount of Habitat Required

Range Attributes	Range Size	565,044 ha
	Population size	100-125
	Population trend	Stable
	Total Habitat Disturbance	135,611 ha
Range Assessment	Assessment of the current condition of the range to support a self-sustaining local population	Self-Sustaining
Determination of Amount of Habitat	A) Range Size	565,044 ha (100%)
	B) Total Habitat Disturbance ¹	135,611 ha (24%)
	C) Critical Habitat ²	367,279ha (65%)

¹ Total Habitat Disturbance reflects loss of functional habitat. It will be more than the associated disturbance footprint (e.g. 100 ha footprint could lead to 400 ha loss of functional habitat).

² The available undisturbed habitat is more than 65% of the range.

Critical Habitat Identification: Wapisi (Manitoba)

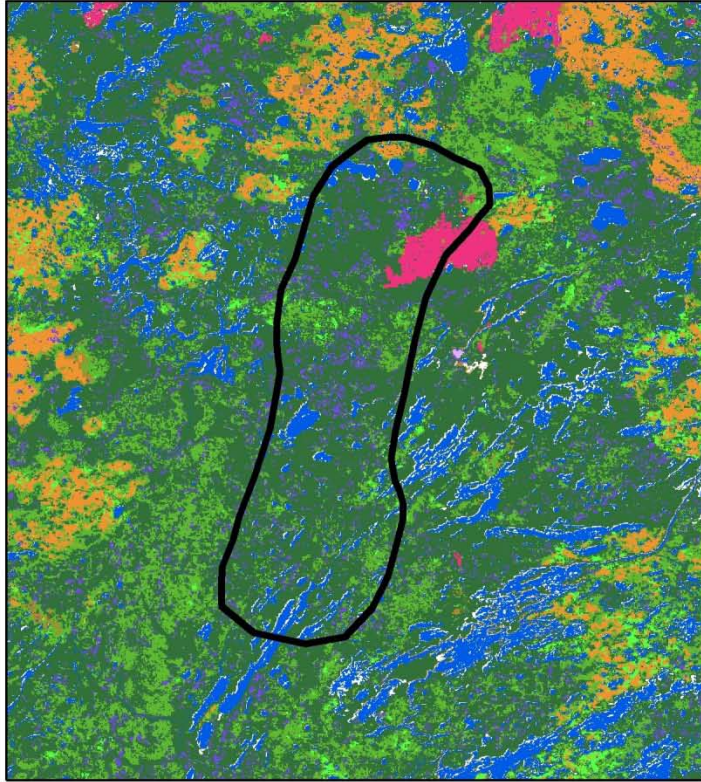
C) **Type:** Biophysical attributes.

Table 1: Biophysical attributes of boreal caribou habitat in the Boreal Shield West ecozone.

Type of selection	Description
Broad scale	Conifer/tamarack-dominated peatland complexes, muskegs or bogs, use dry islands in the middle of muskegs and upland moderate to dense mature conifer forests (jack pine, black spruce, tamarack) with abundant lichens. Hilly or higher ground, lots of smaller lakes in area.
Calving	Peatlands, stands dominated by black spruce, mature forest stands and treed muskeg all used for calving. Caribou will use islands, small lakes, lakeshores during calving.
Post-calving	Wooded lakeshores, islands, sparsely treed rock, upland conifer-spruce and treed muskeg are used in summer. Sites with a high abundance of arboreal lichen are important for foraging in some areas. Dense conifer and mixed forest are also used.
Rutting	Dense and sparse conifer and mixed forests. Open riparian habitats are also used during the rut.
Winter	Mature upland spruce, pine stands and treed muskeg. Jack pine dominated forests. Caribou select sparse and dense conifer, mixed forests and treed bogs. In some areas caribou will select habitat with greater visibility and further away from forest edges.
Travel	Some males move > 100 km during the rutting season. Traditional travel routes between summer and winter ranges occur in large peatland complexes. Caribou migrate in a north to south pattern.
Avoidance	Avoid shrub-rich habitats and hardwood-dominated stands. Avoidance of conifer stands that are not black spruce, deciduous stands, shrub-rich fens and wetlands during calving. Avoid recent burns and disturbed/fragmented areas, including roads.

Critical Habitat Identification: Wapisi (Manitoba)

D) Additional Information:

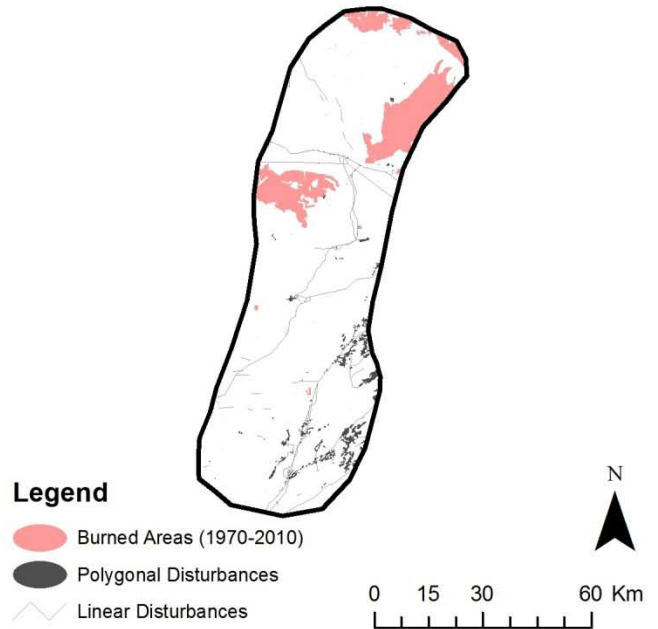


Landcover

- | | | |
|-------------------|------------|--------------|
| Water | Shrub | Rock Outcrop |
| Coniferous Forest | Herbaceous | Recent Burn |
| Deciduous Forest | Wetland | Old Burn |
| Mixed Forest | Cropland | Built-Up |

MODIS 2005 Landcover (250m Pixels) (Generated by CCRS)
 Legend reclassified by EC
 With NTDB 1:250,000 Hydrology Layer

Disturbances Across Caribou Range



*Based on fire data provided by jurisdictions

Disturbance Type and Amount:

- Burned Areas = 10%
- Buffered⁴ Anthropogenic (no reservoirs) = 14 %
- Total Habitat Disturbance = 24%⁵

⁴ Buffered means a 500m buffer is applied to linear and polygonal disturbances.
⁵ Total Habitat Disturbance is non-overlapping which means anthropogenic disturbances and burned areas that overlap are not counted twice in the total.

Critical Habitat Identification: Manitoba (Manitoba)

The identification of critical habitat for boreal caribou is described by three factors for each local population: i) Location of habitat; ii) Amount of habitat; and iii) Type of habitat.

A) **Location:** Where critical habitat is found.

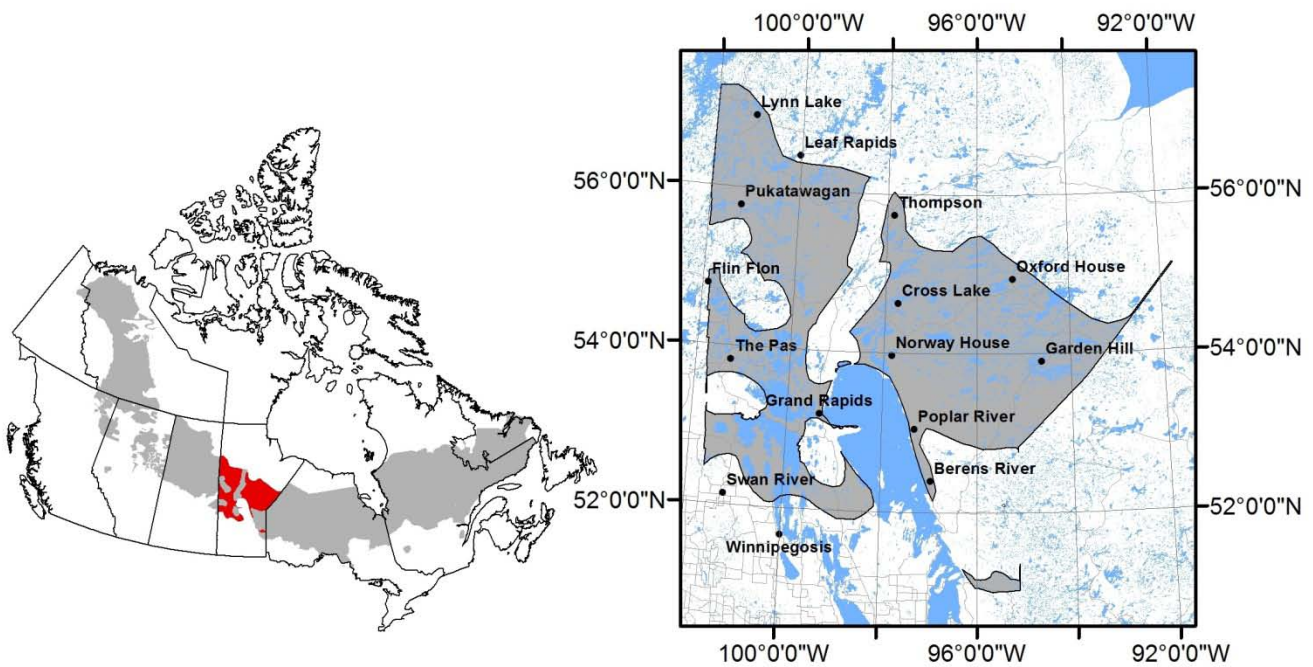


Figure 1: Keymap of the general location of the local population (in red).

Figure 2: The geographic boundary within which critical habitat is located (in grey).

B) **Amount:** Quantity of critical habitat.

Table 1: Range Attributes and the Amount of Habitat Required

Range Attributes	Range Size	14,958,322 ha
	Population size	775-1585
	Population trend	Stable
	Total Habitat Disturbance	4,188,330 ha
Range Assessment	Assessment of the current condition of the range to support a self-sustaining local population	Self-Sustaining
Determination of Amount of Habitat	A) Range Size	14,958,322 ha (100%)
	B) Total Habitat Disturbance ¹	4,188,330 ha (28%)
	C) Critical Habitat ²	9,722,909 ha (65%)

¹ Total Habitat Disturbance reflects loss of functional habitat. It will be more than the associated disturbance footprint (e.g. 100 ha footprint could lead to 400 ha loss of functional habitat).

² The available undisturbed habitat is more than 65% of the range.

Critical Habitat Identification: Manitoba (Manitoba)

C) Type: Biophysical attributes

Table 1: Biophysical attributes of boreal caribou habitat in the Boreal Shield West ecozone.

Type of selection	Description
Broad scale	Conifer/tamarack-dominated peatland complexes, muskegs or bogs, use dry islands in the middle of muskegs and upland moderate to dense mature conifer forests (jack pine, black spruce, tamarack) with abundant lichens. Hilly or higher ground, lots of smaller lakes in area.
Calving	Peatlands, stands dominated by black spruce, mature forest stands and treed muskeg all used for calving. Caribou will use islands, small lakes, lakeshores during calving.
Post-calving	Wooded lakeshores, islands, sparsely treed rock, upland conifer-spruce and treed muskeg are used in summer. Sites with a high abundance of arboreal lichen are important for foraging in some areas. Dense conifer and mixed forest are also used.
Rutting	Dense and sparse conifer and mixed forests. Open riparian habitats are also used during the rut.
Winter	Mature upland spruce, pine stands and treed muskeg. Jack pine dominated forests. Caribou select sparse and dense conifer, mixed forests and treed bogs. In some areas caribou will select habitat with greater visibility and further away from forest edges.
Travel	Some males move > 100 km during the rutting season. Traditional travel routes between summer and winter ranges occur in large peatland complexes. Caribou migrate in a north to south pattern.
Avoidance	Avoid shrub-rich habitats and hardwood-dominated stands. Avoidance of conifer stands that are not black spruce, deciduous stands, shrub-rich fens and wetlands during calving. Avoid recent burns and disturbed/fragmented areas, including roads.

Table 2: Biophysical attributes of boreal caribou habitat in the Boreal Shield West Central ecozone.

Type of selection	Description
Broad scale	Mature conifer uplands and conifer/tamarack dominated lowlands. Conifer/tamarack-dominated peatlands, muskegs with abundant arboreal lichens, upland mature conifer forests stands with abundant terrestrial lichen and rocky areas with sparse trees. Elevations of 300 m. Intermediate values of Normalized Difference Vegetation Index. Selection for old (>40 yrs) burns.
Calving	Forested wetlands/treed bog, old burns, sparse conifer and dense spruce. Need lichen availability. Peatlands, raised hillrocks with large muskeg areas, forested islands and shorelines of large lakes selected during calving. Jack pine or jack pine/black spruce forests also used for calving.
Post-calving	Peatland with forested islands, islands, and shorelines selected during summer. Mature, dense forest stands.
Rutting	Semi-open and open bogs and mature conifer uplands selected during rutting. Terrestrial lichens and arboreal lichens, sedges and bog ericoids (<i>Andromeda glaucophylla</i> , <i>Chamaedaphne calyculata</i> , <i>Kalmia polifolia</i> , <i>Ledum groenlandicum</i>) are important sources of forage.
Winter	Mature coniferous stands. Areas with a high proportion of lakes (> 5-100 ha) with convoluted shorelines. Caribou forage in areas with high lichen abundance and fewer shrubs in jack pine and black spruce stands with low tree densities, low basal areas and short heights. Caribou select open bogs, intermediate to mature jack pine rock ridges, jack pine habitats with lichens and lakes, but move to jack pine ridges in mature conifer stands with lichen when winter conditions prevent foraging in bogs. Glacial erratics, arboreal lichens, terrestrial lichens, sedges and ericaceous species are an important source of forage.
Travel	Travel mainly in conifer forests, avoiding open habitats (e.g. lakes, disturbed areas, etc.) when migrating from summer to winter habitat. Use frozen lakes for travel during winter/spring, in some instances to reach islands for calving. Spring migration is not restricted to specific travel routes. Some move at a range of 100 km during the rutting season.

Critical Habitat Identification: Manitoba (Manitoba)

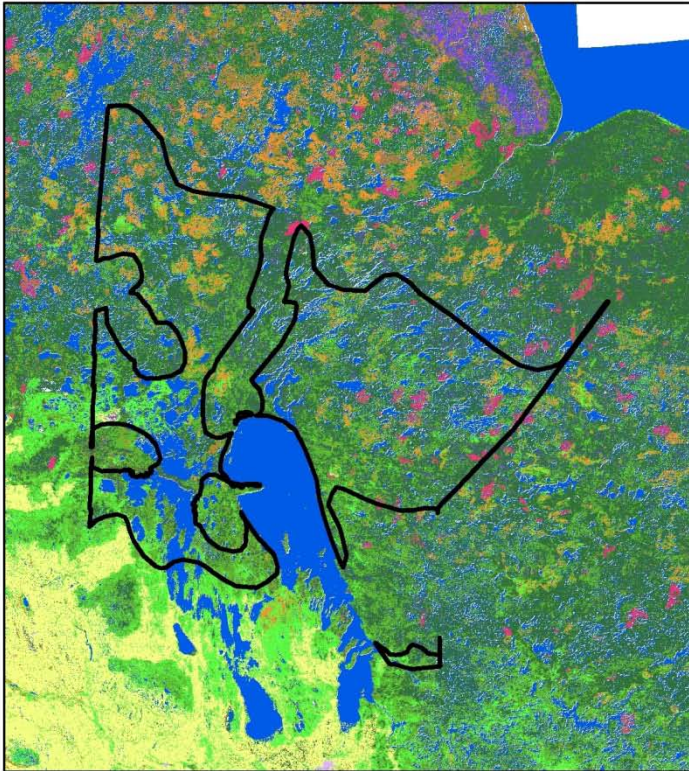
Type of selection	Description
	Caribou moved 8-60 km away after logging operations were begun.
Avoidance	<p>Shrub-rich fens are avoided during calving.</p> <p>Tamarack fens avoided during post-calving.</p> <p>Early successional stands, mixed softwood stands and areas with windfallen trees avoided in winter.</p> <p>Vesicular ice, areas with snow depths greater than 65 cm and snow crusted areas with a hardness greater than 400g/cm² were also avoided during winter.</p> <p>Caribou used areas immediately post fire, but then gradually avoided these areas as more time elapsed.</p> <p>Areas where active logging is taking place are avoided.</p> <p>Avoid roads.</p>

Table 3: Biophysical attributes of boreal caribou habitat in the Boreal Plains ecozone.

Type of selection	Description
Broad scale	<p>Late seral-stage (> 50 yrs old) conifer forest (jack pine, black spruce, tamarack), treed peatlands, muskegs or bogs, use dry islands in the middle of muskegs, with abundant lichens. Hilly or higher ground and small lakes. Restricted primarily to peatland complexes.</p> <p>Elevations of 1135 m.</p> <p>Selected old (>40 yrs) burns.</p>
Calving	<p>Bogs and mature forests selected for calving as well as islands and small lakes.</p> <p>Peatlands and stands dominated by black spruce and lowland black spruce stands within muskeg are used for calving.</p>
Post-calving	<p>Forest stands older than 50 yrs.</p> <p>Upland black spruce/jack pine forests, lowland black spruce, young jack pine and open and treed peatlands and muskeg are also selected during summer. Use lichen and low muskeg vegetation.</p> <p>In some areas, sites with abundant arboreal lichen are selected during summer.</p>
Rutting	<p>Mature forests.</p> <p>Upland black spruce/jack pine forests, lowland black spruce, young jack pine and open and treed peatlands and muskeg during summer.</p>
Winter	<p>Treed peatlands, treed bog and treed fen and open fen complexes with > 50% peatland coverage with high abundance of lichens.</p> <p>Use of small lakes, rock outcrops on lakes for lichen access.</p> <p>Mature forest > 50 yrs old.</p> <p>Upland black spruce/jack pine forests, lowland black spruce, young jack pine and open and treed peatlands.</p>
Avoidance	<p>Avoid upland and fen habitats, aspen dominated stands, immature stands and large rivers all year round.</p> <p>Avoid matrix-type habitat, including areas with abundant shrubs, disturbed/fragmented habitats, hardwood/deciduous dominated forest stands, and edge habitat.</p> <p>Avoid recent burns, main roads, seismic lines, well sites and areas with a high density of cut blocks.</p> <p>Avoidance of water.</p>

Critical Habitat Identification: Manitoba (Manitoba)

D) Additional Information:

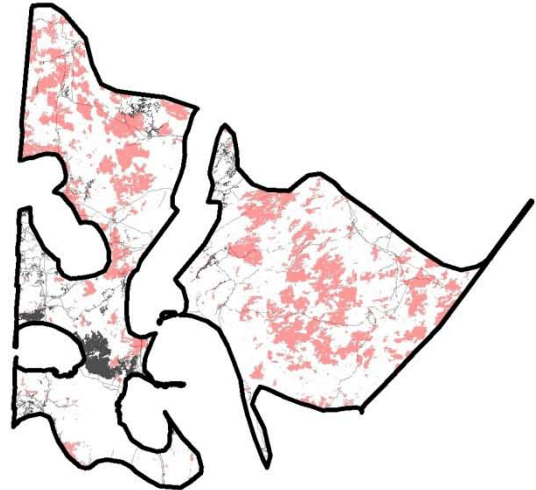


Landcover

- | | | |
|-------------------|------------|--------------|
| Water | Shrub | Rock Outcrop |
| Coniferous Forest | Herbaceous | Recent Burn |
| Deciduous Forest | Wetland | Old Burn |
| Mixed Forest | Cropland | Built-Up |

MODIS 2005 Landcover (250m Pixels) (Generated by CCRS)
 Legend reclassified by EC
 With NTDB 1:250,000 Hydrology Layer

Disturbances Across Caribou Range



Legend

- | | |
|--------------------------|------------------------|
| Burned Areas (1970-2010) | Polygonal Disturbances |
| Linear Disturbances | |
- 0 75 150 300 Km

*Based on fire data provided by jurisdictions

Disturbance Type and Amount:

- Burned Areas = 22%
- Buffered⁴ Anthropogenic (no reservoirs) = 8%
- Total Habitat Disturbance = 28%⁵

⁴ Buffered means a 500m buffer is applied to linear and polygonal disturbances.
⁵ Total Habitat Disturbance is non-overlapping which means anthropogenic disturbances and burned areas that overlap are not counted twice in the total.

Critical Habitat Identification: Atikaki - Berens (Manitoba)

The identification of critical habitat for boreal caribou is described by three factors for each local population: i) Location of habitat; ii) Amount of habitat; and iii) Type of habitat.

A) **Location:** Where critical habitat is found.

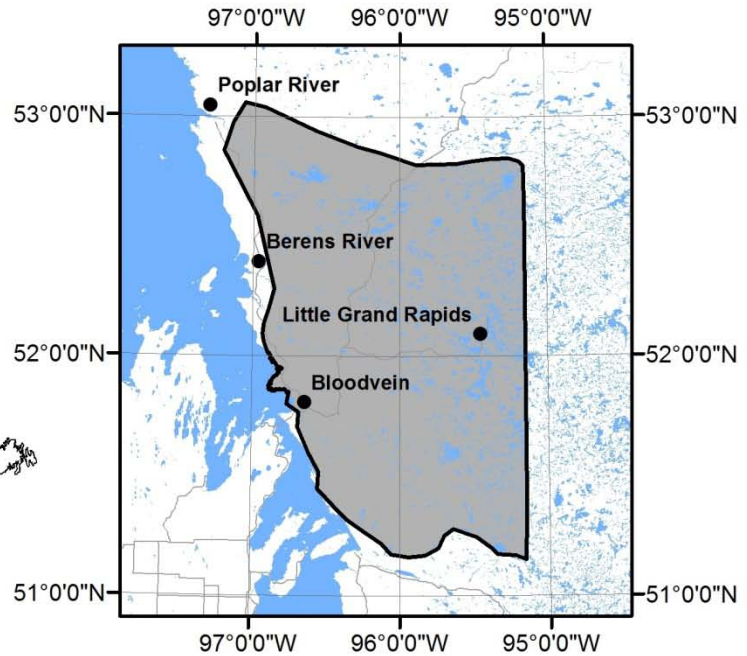


Figure 1: Keymap of the general location of the local population (in red).

Figure 2: The geographic boundary within which critical habitat is located (in grey).

B) **Amount:** Quantity of critical habitat.

Table 1: Range Attributes and the Amount of Habitat Required

Range Attributes	Range Size	2,114,075 ha
	Population size	300-500
	Population trend	Stable
	Total Habitat Disturbance	739,926 ha
Range Assessment	Assessment of the current condition of the range to support a self-sustaining local population	Self-Sustaining
Determination of Amount of Habitat	A) Range Size	2,114,075 ha (100%)
	B) Total Habitat Disturbance ¹	739,926 ha (35%)
	C) Critical Habitat ²	1,374,149 ha (65%)

¹ Total Habitat Disturbance reflects loss of functional habitat. It will be more than the associated disturbance footprint (e.g. 100 ha footprint could lead to 400 ha loss of functional habitat).

² The available undisturbed habitat is more than 65% of the range.

Critical Habitat Identification: Atikaki - Berens (Manitoba)

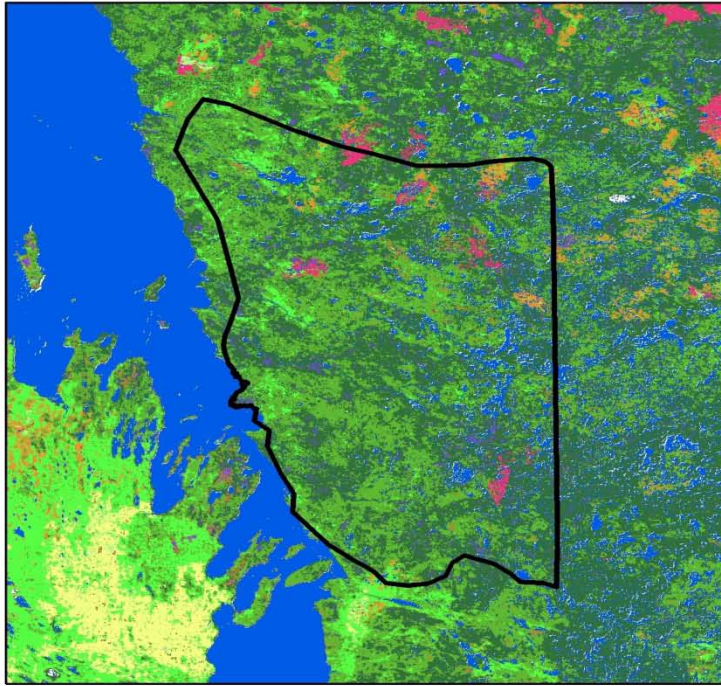
C) **Type:** Biophysical attributes.

Table 1: Biophysical attributes of boreal caribou habitat in the Boreal Shield West Central ecozone.

Type of selection	Description
Broad scale	Mature conifer uplands and conifer/tamarack dominated lowlands. Conifer/tamarack-dominated peatlands, muskegs with abundant arboreal lichens, upland mature conifer forests stands with abundant terrestrial lichen and rocky areas with sparse trees. Elevations of 300 m. Intermediate values of Normalized Difference Vegetation Index. Selection for old (>40 yrs) burns.
Calving	Forested wetlands/treed bog, old burns, sparse conifer and dense spruce. Need lichen availability. Peatlands, raised hillrocks with large muskeg areas, forested islands and shorelines of large lakes selected during calving. Jack pine or jack pine/black spruce forests also used for calving.
Post-calving	Peatland with forested islands, islands, and shorelines selected during summer. Mature, dense forest stands.
Rutting	Semi-open and open bogs and mature conifer uplands selected during rutting. Terrestrial lichens and arboreal lichens, sedges and bog ericoids (<i>Andromeda glaucophylla</i> , <i>Chamaedaphne calyculata</i> , <i>Kalmia polifolia</i> , <i>Ledum groenlandicum</i>) are important sources of forage.
Winter	Mature coniferous stands. Areas with a high proportion of lakes (> 5-100 ha) with convoluted shorelines. Caribou forage in areas with high lichen abundance and fewer shrubs in jack pine and black spruce stands with low tree densities, low basal areas and short heights. Caribou select open bogs, intermediate to mature jack pine rock ridges, jack pine habitats with lichens and lakes, but move to jack pine ridges in mature conifer stands with lichen when winter conditions prevent foraging in bogs. Glacial erratics, arboreal lichens, terrestrial lichens, sedges and ericaceous species are an important source of forage.
Travel	Travel mainly in conifer forests, avoiding open habitats (e.g. lakes, disturbed areas, etc.) when migrating from summer to winter habitat. Use frozen lakes for travel during winter/spring, in some instances to reach islands for calving. Spring migration is not restricted to specific travel routes. Some move at a range of 100 km during the rutting season. Caribou moved 8-60 km away after logging operations were begun.
Avoidance	Shrub-rich fens are avoided during calving. Tamarack fens avoided during post-calving. Early successional stands, mixed softwood stands and areas with windfallen trees avoided in winter. Vesicular ice, areas with snow depths greater than 65 cm and snow crusted areas with a hardness greater than 400g/cm ² were also avoided during winter. Caribou used areas immediately post fire, but then gradually avoided these areas as more time elapsed. Areas where active logging is taking place are avoided. Avoid roads.

Critical Habitat Identification: Atikaki - Berens (Manitoba)

D) Additional Information:

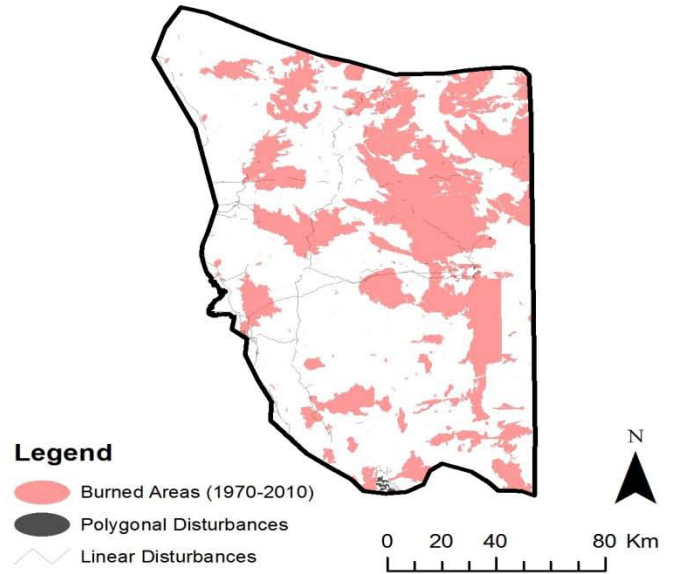


Landcover

- | | | |
|-------------------|------------|--------------|
| Water | Shrub | Rock Outcrop |
| Coniferous Forest | Herbaceous | Recent Burn |
| Deciduous Forest | Wetland | Old Burn |
| Mixed Forest | Cropland | Built-Up |

MODIS 2005 Landcover (250m Pixels) (Generated by CCRS)
 Legend reclassified by EC
 With NTDB 1:250,000 Hydrology Layer

Disturbances Across Caribou Range



*Based on fire data provided by jurisdictions

Disturbance Type and Amount:

- Burned Areas = 32%
- Buffered⁴ Anthropogenic (no reservoirs) = 5%
- Total Habitat Disturbance = 35%⁵

⁴ Buffered means a 500m buffer is applied to linear and polygonal disturbances.

⁵ Total Habitat Disturbance is non-overlapping which means anthropogenic disturbances and burned areas that overlap are not counted twice in the total.

Critical Habitat Identification: Churchill (Ontario)

The identification of critical habitat for boreal caribou is described by three factors for each local population: i) Location of habitat; ii) Amount of habitat; and iii) Type of habitat.

A) **Location:** Where critical habitat is found.



Figure 1: Keymap of the general location of the local population (in red).



Figure 2: The geographic boundary within which critical habitat is located (in grey).

B) **Amount:** Quantity of critical habitat.

Table 1: Range Attributes and the Amount of Habitat Required

Range Attributes	Range Size	2,150,490 ha
	Population size	Unknown
	Population trend	Unknown
	Total Habitat Disturbance	666,652 ha
Range Assessment	Assessment of the current condition of the range to support a self-sustaining local population	Self-Sustaining
Determination of Amount of Habitat	A) Range Size	2,150,490 ha (100%)
	B) Total Habitat Disturbance ¹	666,652 ha (31%)
	C) Critical Habitat ²	1,397,819 ha (65%)

¹ Total Habitat Disturbance reflects loss of functional habitat. It will be more than the associated disturbance footprint (e.g. 100 ha footprint could lead to 400 ha loss of functional habitat).

² The available undisturbed habitat is more than 65% of the range.

Critical Habitat Identification: Churchill (Ontario)

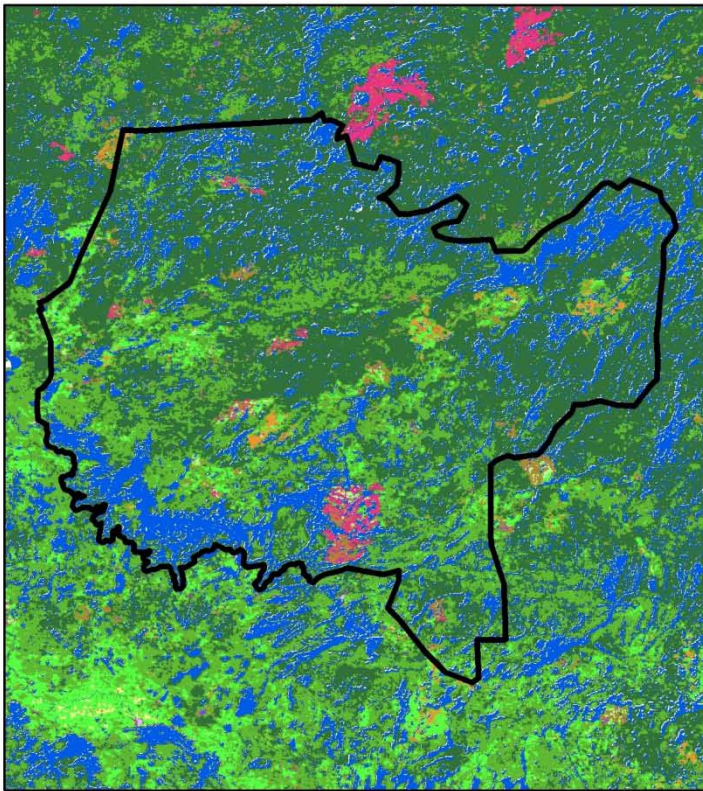
C) **Type:** Biophysical attributes.

Table 1: Biophysical attributes of boreal caribou habitat in the Boreal Shield West Central ecozone.

Type of selection	Description
Broad scale	<p>Mature conifer uplands and conifer/tamarack dominated lowlands. Conifer/tamarack-dominated peatlands, muskegs with abundant arboreal lichens, upland mature conifer forests stands with abundant terrestrial lichen and rocky areas with sparse trees. Elevations of 300 m. Intermediate values of Normalized Difference Vegetation Index. Selection for old (>40 yrs) burns.</p>
Calving	<p>Forested wetlands/treed bog, old burns, sparse conifer and dense spruce. Need lichen availability. Peatlands, raised hillrocks with large muskeg areas, forested islands and shorelines of large lakes selected during calving. Jack pine or jack pine/black spruce forests also used for calving.</p>
Post-calving	<p>Peatland with forested islands, islands, and shorelines selected during summer. Mature, dense forest stands.</p>
Rutting	<p>Semi-open and open bogs and mature conifer uplands selected during rutting. Terrestrial lichens and arboreal lichens, sedges and bog ericoids (<i>Andromeda glaucophylla</i>, <i>Chamaedaphne calyculata</i>, <i>Kalmia polifolia</i>, <i>Ledum groenlandicum</i>) are important sources of forage.</p>
Winter	<p>Mature coniferous stands. Areas with a high proportion of lakes (> 5-100 ha) with convoluted shorelines. Caribou forage in areas with high lichen abundance and fewer shrubs in jack pine and black spruce stands with low tree densities, low basal areas and short heights. Caribou select open bogs, intermediate to mature jack pine rock ridges, jack pine habitats with lichens and lakes, but move to jack pine ridges in mature conifer stands with lichen when winter conditions prevent foraging in bogs. Glacial erratics, arboreal lichens, terrestrial lichens, sedges and ericaceous species are an important source of forage.</p>
Travel	<p>Travel mainly in conifer forests, avoiding open habitats (e.g. lakes, disturbed areas, etc.) when migrating from summer to winter habitat. Use frozen lakes for travel during winter/spring, in some instances to reach islands for calving. Spring migration is not restricted to specific travel routes. Some move at a range of 100 km during the rutting season. Caribou moved 8-60 km away after logging operations were begun.</p>
Avoidance	<p>Shrub-rich fens are avoided during calving. Tamarack fens avoided during post-calving. Early successional stands, mixed softwood stands and areas with windfallen trees avoided in winter. Vesicular ice, areas with snow depths greater than 65 cm and snow crusted areas with a hardness greater than 400g/cm² were also avoided during winter. Caribou used areas immediately post fire, but then gradually avoided these areas as more time elapsed. Areas where active logging is taking place are avoided. Avoid roads.</p>

Critical Habitat Identification: Churchill (Ontario)

D) Additional Information:

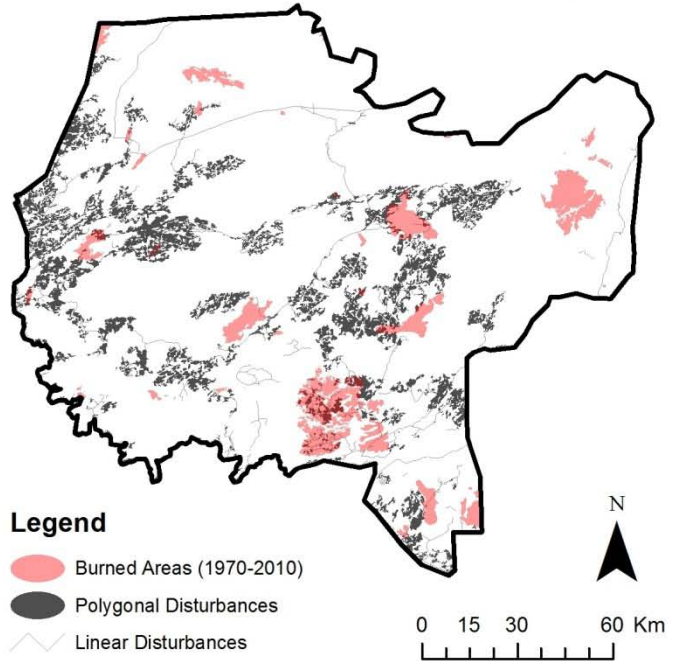


Landcover

- | | | |
|-------------------|------------|--------------|
| Water | Shrub | Rock Outcrop |
| Coniferous Forest | Herbaceous | Recent Burn |
| Deciduous Forest | Wetland | Old Burn |
| Mixed Forest | Cropland | Built-Up |

MODIS 2005 Landcover (250m Pixels) (Generated by CCRS)
 Legend reclassified by EC
 With NTDB 1:250,000 Hydrology Layer

Disturbances Across Caribou Range



Legend

- Burned Areas (1970-2010)
- Polygonal Disturbances
- Linear Disturbances

*Based on fire data provided by jurisdictions

Disturbance Type and Amount:

Burned Areas = 6%
 Buffered³ Anthropogenic (no reservoirs) = 28%
 Total Habitat Disturbance = 31%⁴

³ Buffered means a 500m buffer is applied to linear and polygonal disturbances.

⁴ Total Habitat Disturbance is non-overlapping which means anthropogenic disturbances and burned areas that overlap are not counted twice in the total.

Critical Habitat Identification: Nipigon (Ontario)

The identification of critical habitat for boreal caribou is described by three factors for each local population: i) Location of habitat; ii) Amount of habitat; and iii) Type of habitat.

A) **Location:** Where critical habitat is found.

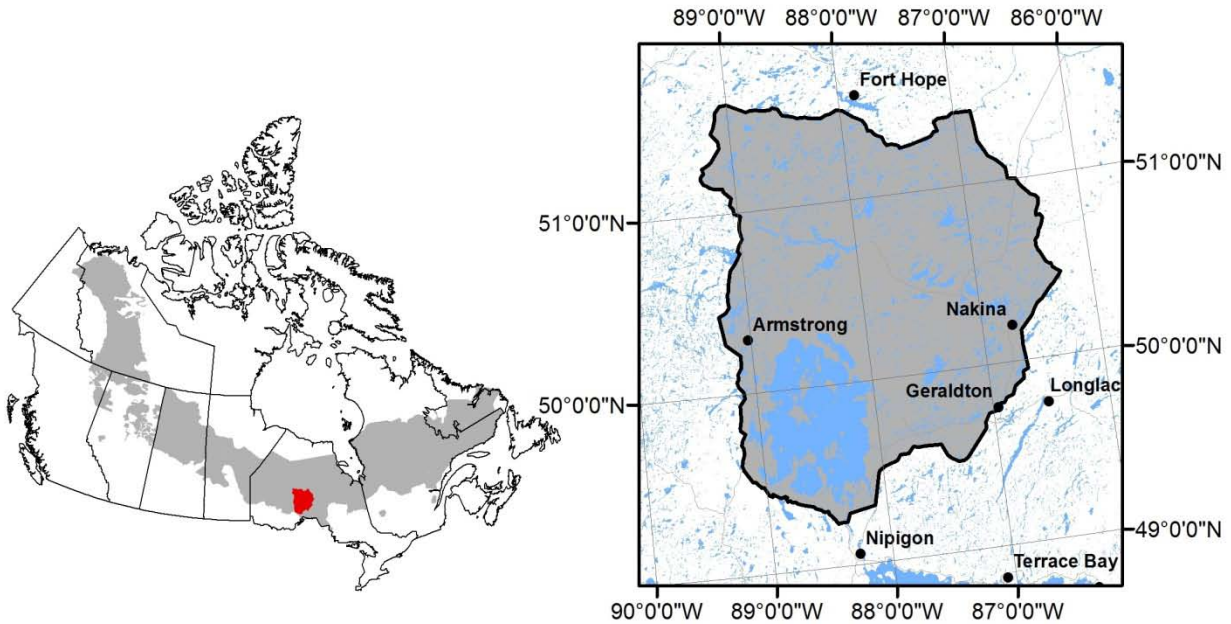


Figure 1: Keymap of the general location of the local population (in red).

Figure 2: The geographic boundary within which critical habitat is located (in grey).

B) **Amount:** Quantity of critical habitat.

Table 1: Range Attributes and the Amount of Habitat Required

Range Attributes	Range Size	3,885,026 ha
	Population size	300
	Population trend	Stable
	Total Habitat Disturbance	1,204,358 ha
Range Assessment	Assessment of the current condition of the range to support a self-sustaining local population	Self-Sustaining
Determination of Amount of Habitat	A) Range Size	3,885,026 ha (100%)
	B) Total Habitat Disturbance ¹	1,204,358 ha (31%)
	C) Critical Habitat ²	2,525,267ha (65%)

¹ Total Habitat Disturbance reflects loss of functional habitat. It will be more than the associated disturbance footprint (e.g. 100 ha footprint could lead to 400 ha loss of functional habitat).

² The available undisturbed habitat is more than 65% of the range.

Critical Habitat Identification: Nipigon (Ontario)

C) **Type:** Biophysical attributes.

Table 1: Biophysical attributes of boreal caribou habitat in the Boreal Shield West ecozone.

Type of selection	Description
Broad scale	Conifer/tamarack-dominated peatland complexes, muskegs or bogs, use dry islands in the middle of muskegs and upland moderate to dense mature conifer forests (jack pine, black spruce, tamarack) with abundant lichens. Hilly or higher ground, lots of smaller lakes in area.
Calving	Peatlands, stands dominated by black spruce, mature forest stands and treed muskeg all used for calving. Caribou will use islands, small lakes, lakeshores during calving.
Post-calving	Wooded lakeshores, islands, sparsely treed rock, upland conifer-spruce and treed muskeg are used in summer. Sites with a high abundance of arboreal lichen are important for foraging in some areas. Dense conifer and mixed forest are also used.
Rutting	Dense and sparse conifer and mixed forests. Open riparian habitats are also used during the rut.
Winter	Mature upland spruce, pine stands and treed muskeg. Jack pine dominated forests. Caribou select sparse and dense conifer, mixed forests and treed bogs. In some areas caribou will select habitat with greater visibility and further away from forest edges.
Travel	Some males move > 100 km during the rutting season. Traditional travel routes between summer and winter ranges occur in large peatland complexes. Caribou migrate in a north to south pattern.
Avoidance	Avoid shrub-rich habitats and hardwood-dominated stands. Avoidance of conifer stands that are not black spruce, deciduous stands, shrub-rich fens and wetlands during calving. Avoid recent burns and disturbed/fragmented areas, including roads.

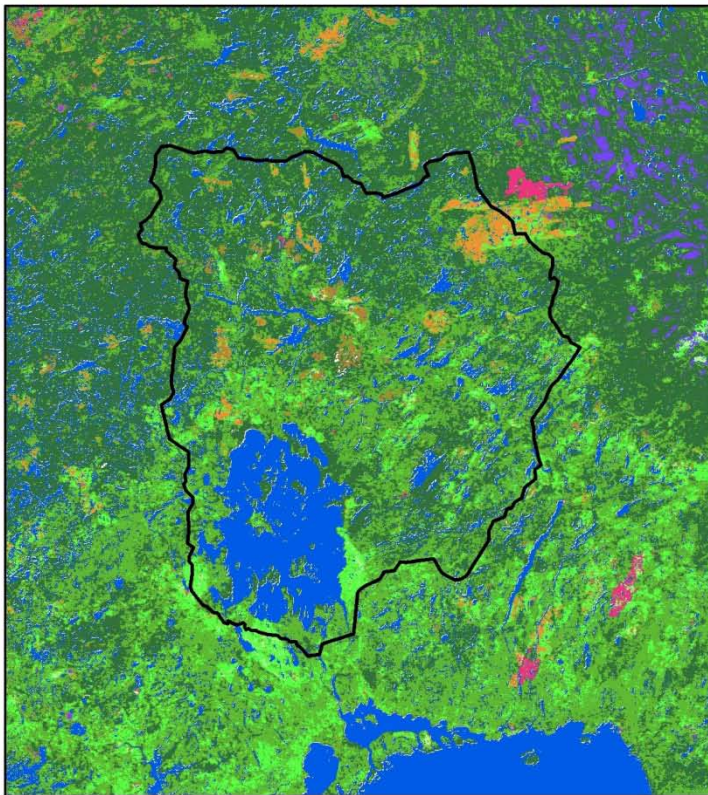
Table 2: Biophysical attributes of boreal caribou habitat in the Boreal Shield West Central ecozone.

Type of selection	Description
Broad scale	Mature conifer uplands and conifer/tamarack dominated lowlands. Conifer/tamarack-dominated peatlands, muskegs with abundant arboreal lichens, upland mature conifer forests stands with abundant terrestrial lichen and rocky areas with sparse trees. Elevations of 300 m. Intermediate values of Normalized Difference Vegetation Index. Selection for old (>40 yrs) burns.
Calving	Forested wetlands/treed bog, old burns, sparse conifer and dense spruce. Need lichen availability. Peatlands, raised hillrocks with large muskeg areas, forested islands and shorelines of large lakes selected during calving. Jack pine or jack pine/black spruce forests also used for calving.
Post-calving	Peatland with forested islands, islands, and shorelines selected during summer. Mature, dense forest stands.
Rutting	Semi-open and open bogs and mature conifer uplands selected during rutting. Terrestrial lichens and arboreal lichens, sedges and bog ericoids (<i>Andromeda glaucophylla</i> , <i>Chamaedaphne calyculata</i> , <i>Kalmia polifolia</i> , <i>Ledum groenlandicum</i>) are important sources of forage.
Winter	Mature coniferous stands. Areas with a high proportion of lakes (> 5-100 ha) with convoluted shorelines. Caribou forage in areas with high lichen abundance and fewer shrubs in jack pine and black spruce stands with low tree densities, low basal areas and short heights. Caribou select open bogs, intermediate to mature jack pine rock ridges, jack pine habitats with lichens and lakes, but move to jack pine ridges in mature conifer stands with lichen when winter conditions prevent foraging in bogs. Glacial erratics, arboreal lichens, terrestrial lichens, sedges and ericaceous species are an important source of forage.
Travel	Travel mainly in conifer forests, avoiding open habitats (e.g. lakes, disturbed areas, etc.) when migrating from summer to winter habitat. Use frozen lakes for travel during winter/spring, in some instances to reach islands for calving. Spring migration is not restricted to specific travel routes. Some move at a range of 100 km during the rutting season.

Critical Habitat Identification: Nipigon (Ontario)

Type of selection	Description
	Caribou moved 8-60 km away after logging operations were begun.
Avoidance	<p>Shrub-rich fens are avoided during calving.</p> <p>Tamarack fens avoided during post-calving.</p> <p>Early successional stands, mixed softwood stands and areas with windfallen trees avoided in winter.</p> <p>Vesicular ice, areas with snow depths greater than 65 cm and snow crusted areas with a hardness greater than 400g/cm² were also avoided during winter.</p> <p>Caribou used areas immediately post fire, but then gradually avoided these areas as more time elapsed.</p> <p>Areas where active logging is taking place are avoided.</p> <p>Avoid roads.</p>

D) Additional Information:

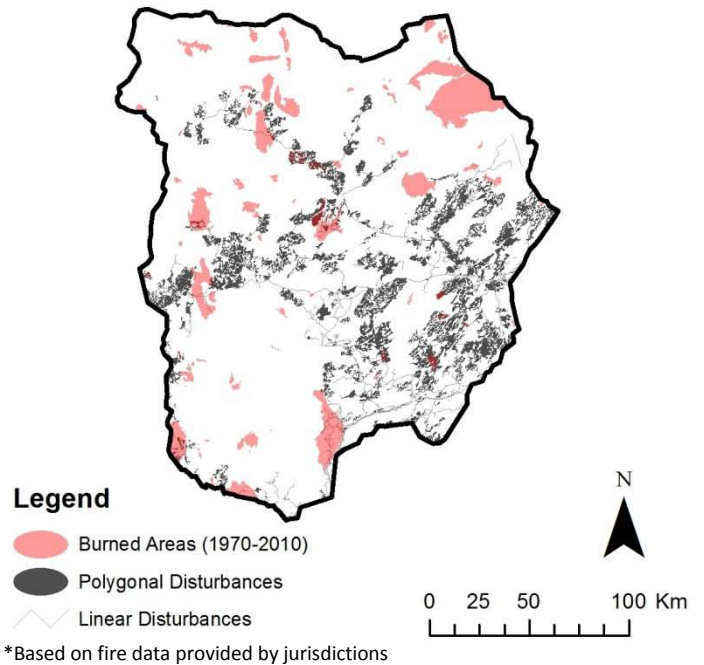


Landcover

- Water
- Shrub
- Rock Outcrop
- Coniferous Forest
- Herbaceous
- Recent Burn
- Deciduous Forest
- Wetland
- Old Burn
- Mixed Forest
- Cropland
- Built-Up

MODIS 2005 Landcover (250m Pixels) (Generated by CCRS)
 Legend reclassified by EC
 With NTDB 1:250,000 Hydrology Layer

Disturbances Across Caribou Range



Disturbance Type and Amount:

Burned Areas = 7%
 Buffered⁴ Anthropogenic (no reservoirs) = 25%
 Total Habitat Disturbance = 31%⁵

⁴ Buffered means a 500m buffer is applied to linear and polygonal disturbances.

⁵ Total Habitat Disturbance is non-overlapping which means anthropogenic disturbances and burned areas that overlap are not counted twice in the total.

Critical Habitat Identification: Coastal (Ontario)

The identification of critical habitat for boreal caribou is described by three factors for each local population: i) Location of habitat; ii) Amount of habitat; and iii) Type of habitat.

A) **Location:** Where critical habitat is found.

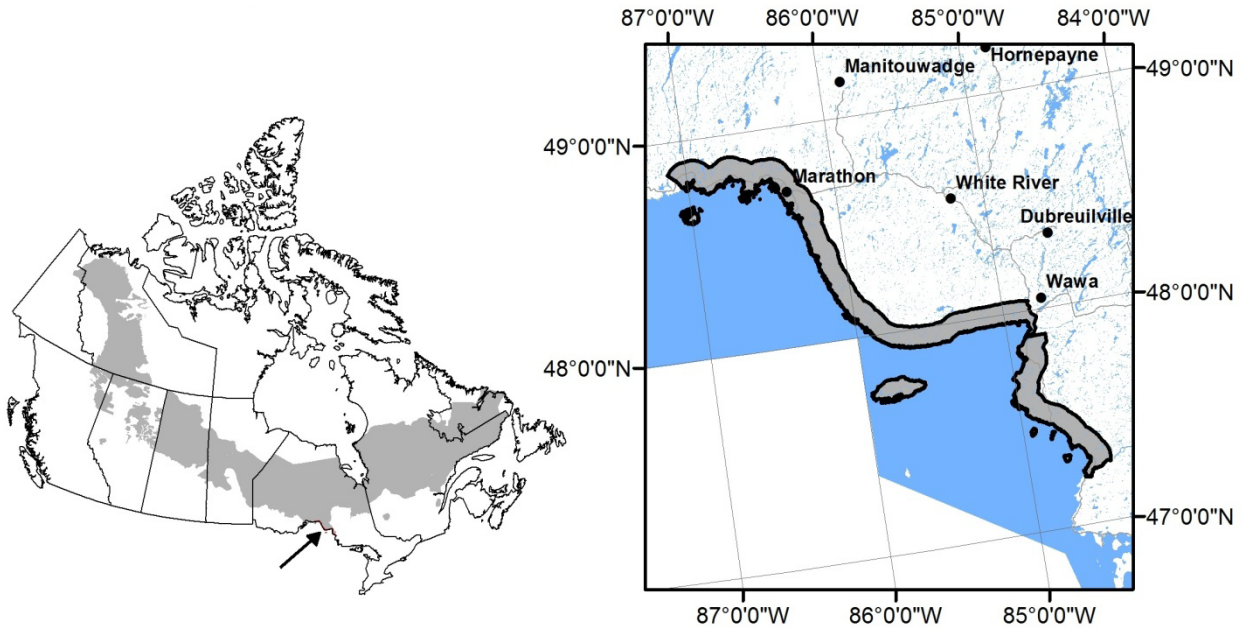


Figure 1: Keymap of the general location of the local population (in red).

Figure 2: The geographic boundary within which critical habitat is located (in grey).

B) **Amount:** Quantity of critical habitat.

Table 1: Range Attributes and the Amount of Habitat Required

Range Attributes	Range Size	376,598 ha
	Population size	492
	Population trend	Unknown
	Total Habitat Disturbance	60,256 ha
Range Assessment	Assessment of the current condition of the range to support a self-sustaining local population	Self-Sustaining
Determination of Amount of Habitat	A) Range Size	376,598 ha (100%)
	B) Total Habitat Disturbance ¹	60,256 ha (16%)
	C) Critical Habitat ²	244,789 ha (65%)

¹ Total Habitat Disturbance reflects loss of functional habitat. It will be more than the associated disturbance footprint (e.g. 100 ha footprint could lead to 400 ha loss of functional habitat).
² The available undisturbed habitat is more than 65% of the range.

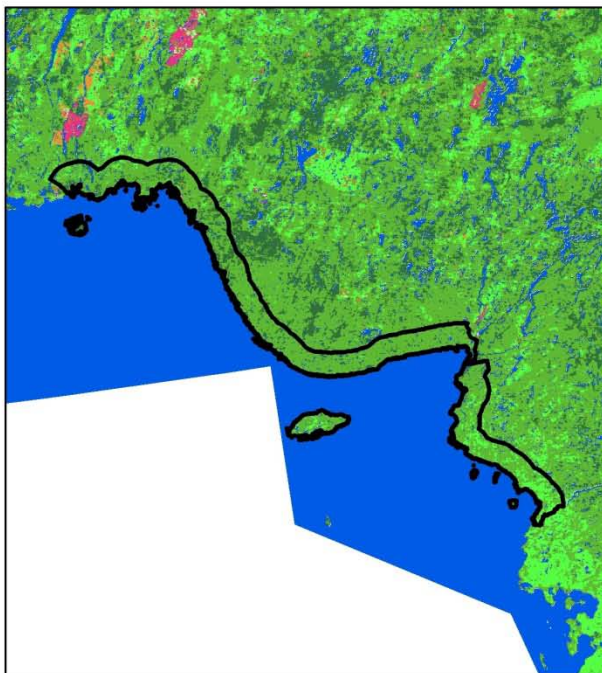
Critical Habitat Identification: Coastal (Ontario)

C) **Type:** Biophysical attributes.

Table 1: Biophysical attributes of boreal caribou habitat in the Boreal Shield Central ecozone.

Type of selection	Description
Broad scale	Late seral-stage black spruce-dominated lowlands and jack pine dominated uplands. Open black spruce lowlands. Low-density late seral-stage jack pine or black spruce forests and black spruce/tamarack-dominated peatlands with abundant terrestrial and moderate arboreal lichens. Caribou also use areas with dry to moist sandy to loamy soils and shallow soils over bedrock. Elevations of 300 m. Intermediate values of Normalized Difference Vegetation Index. Selection for old (>40 yrs) burns.
Calving	Open canopies of mature black spruce and mesic peatland with ericaceous species for calving are selected for calving in the Claybelt region. Females with calves selected areas with more abundant ericaceous shrubs and terrestrial lichens during the summer compared to females without calves.
Winter	Large areas of contiguous forests dominated by black spruce. Open conifer forests or forests with lower tree densities where terrestrial and arboreal lichen are abundant and there is significant less snow (e.g. shorelines) are also selected.
Avoidance	Avoid recently downed woody debris, dense shrubs and larch during the calving season. Avoid mixed conifer and deciduous forests in winter. Areas of deep snow are also avoided during winter. Avoidance of roads and burns <40 yrs old.

D) Additional Information:

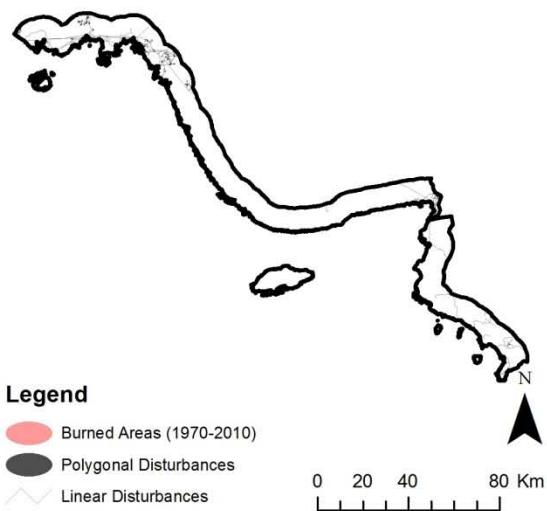


Landcover

- Water
- Shrub
- Rock Outcrop
- Coniferous Forest
- Herbaceous
- Recent Burn
- Deciduous Forest
- Wetland
- Old Burn
- Mixed Forest
- Cropland
- Built-Up

MODIS 2005 Landcover (250m Pixels) (Generated by CCRS)
Legend reclassified by EC
With NTDB 1:250,000 Hydrology Layer

Disturbances Across Caribou Range



Legend

- Burned Areas (1970-2010)
- Polygonal Disturbances
- Linear Disturbances

*Based on fire data provided by jurisdictions

Disturbance Type and Amount:

Burned Areas = 0%
Buffered³ Anthropogenic (no reservoirs) = 16%
Total Habitat Disturbance = 16%⁴

³ Buffered means a 500m buffer is applied to linear and polygonal disturbances.

⁴ Total Habitat Disturbance is non-overlapping which means anthropogenic disturbances and burned areas that overlap are not counted twice in the total.

Critical Habitat Identification: Pagwachuan (Ontario)

The identification of critical habitat for boreal caribou is described by three factors for each local population: i) Location of habitat; ii) Amount of habitat; and iii) Type of habitat.

A) **Location:** Where critical habitat is found.

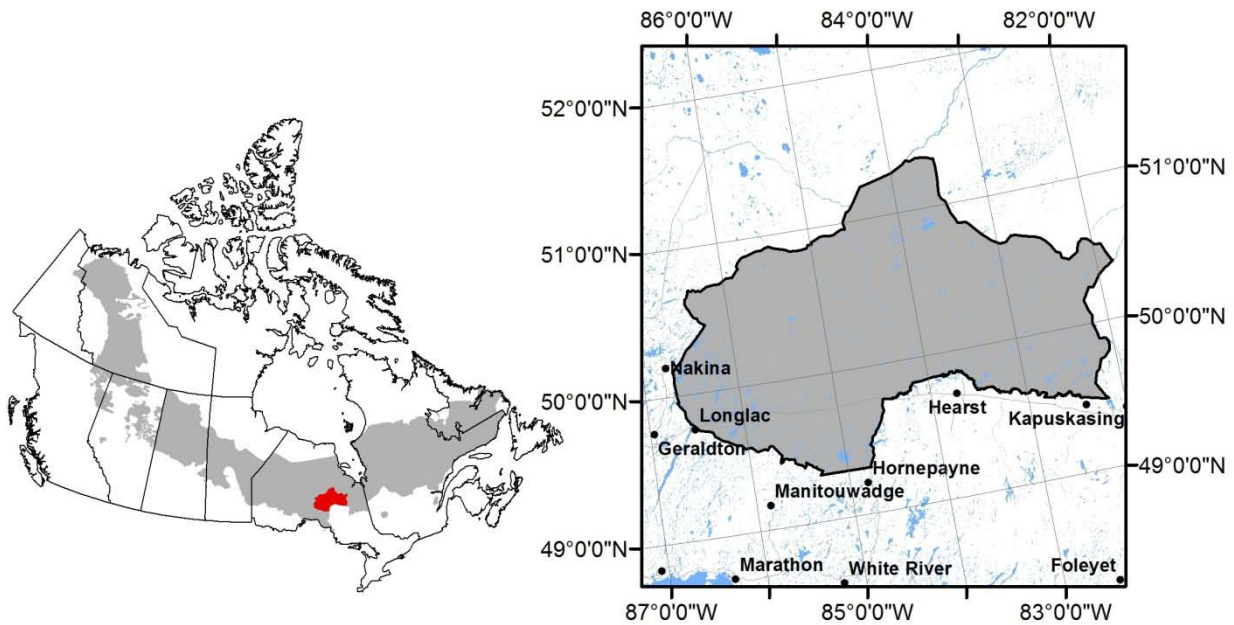


Figure 1: Keymap of the general location of the local population (in red).

Figure 2: The geographic boundary within which critical habitat is located (in grey).

B) **Amount:** Quantity of critical habitat.

Table 1: Range Attributes and the Amount of Habitat Required

Range Attributes	Range Size	4,542,918 ha
	Population size	Unknown
	Population trend	Unknown
	Total Habitat Disturbance	1,226,588 ha
Range Assessment	Assessment of the current condition of the range to support a self-sustaining local population	Self-Sustaining
Determination of Amount of Habitat	A) Range Size	4,542,918 ha (100%)
	B) Total Habitat Disturbance ¹	1,226,588 ha (27%)
	C) Critical Habitat ²	2,952,897ha (65%)

¹ Total Habitat Disturbance reflects loss of functional habitat. It will be more than the associated disturbance footprint (e.g. 100 ha footprint could lead to 400 ha loss of functional habitat).

² The available undisturbed habitat is more than 65% of the range.

Critical Habitat Identification: Pagwachuan (Ontario)

C) **Type:** Biophysical attributes.

Table 1: Biophysical attributes of boreal caribou habitat in the Boreal Shield Central ecozone.

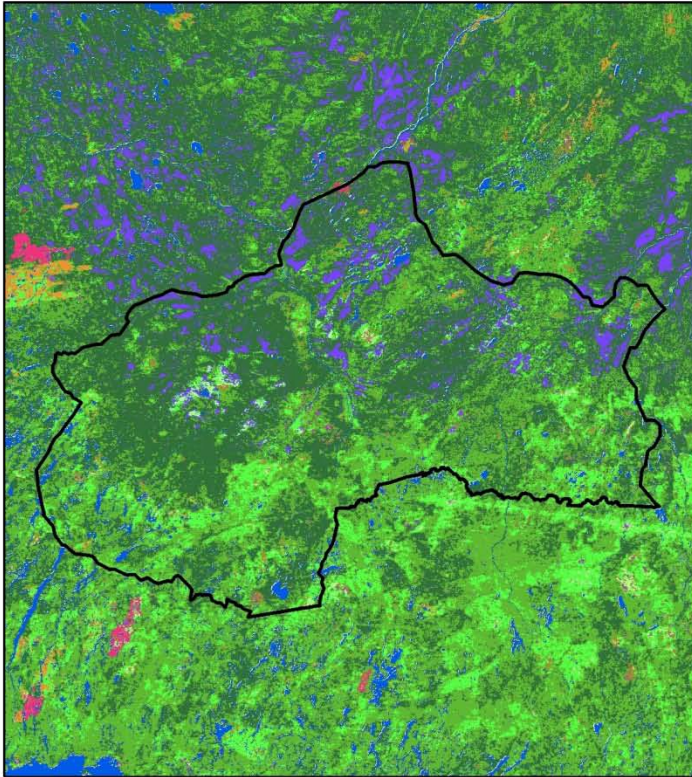
Type of selection	Description
Broad scale	Late seral-stage black spruce-dominated lowlands and jack pine dominated uplands. Open black spruce lowlands. Low-density late seral-stage jack pine or black spruce forests and black spruce/tamarack-dominated peatlands with abundant terrestrial and moderate arboreal lichens. Caribou also use areas with dry to moist sandy to loamy soils and shallow soils over bedrock. Elevations of 300 m. Intermediate values of Normalized Difference Vegetation Index. Selection for old (>40 yrs) burns.
Calving	Open canopies of mature black spruce and mesic peatland with ericaceous species for calving are selected for calving in the Claybelt region. Females with calves selected areas with more abundant ericaceous shrubs and terrestrial lichens during the summer compared to females without calves.
Winter	Large areas of contiguous forests dominated by black spruce. Open conifer forests or forests with lower tree densities where terrestrial and arboreal lichen are abundant and there is significant less snow (e.g. shorelines) are also selected.
Avoidance	Avoid recently downed woody debris, dense shrubs and larch during the calving season. Avoid mixed conifer and deciduous forests in winter. Areas of deep snow are also avoided during winter. Avoidance of roads and burns <40 yrs old.

Table 2: Biophysical attributes of boreal caribou habitat in the Hudson Plains ecozone.

Type of selection	Description
Broad scale	Habitats selected generally to reduce predation risk. Shrub rich treed muskeg and mature conifer forests abundant in lichens. Shorelines of deep lakes and rivers (birch trees). Poorly drained areas dominated by sedges, mosses and lichens, as well as open black spruce and tamarack forests. Elevations of 150m. Intermediate levels of ruggedness and Normalized Difference Vegetation Index.
Calving	Mature conifer stand with and without lichens and muskegs. Preference for higher altitudes compared to habitat use during other periods.
Post-calving	Fens, bogs and lakes.
Rutting	Wetlands and conifer stands with lichen. Mature and regenerating conifer stands are also used, albeit to a lesser degree. Caribou use hills in the lowlands, treed islands in muskegs with several different tree species.
Winter	Dense and mature conifer forests with lichens and wetlands. Peatlands dominated by open bogs and terrestrial lichens. Large patches of intermediate and mature black spruce, shrub-rich treed muskeg and mixed conifer stands all used in late winter.
Travel	Movements greatest in fall/winter when caribou transition from calving to winter habitat. Long range movements are greater in areas with high moose densities, presumably to reduce predation risk.
Avoidance	Avoid herbaceous areas and areas burned within 40 yrs. Deciduous-dominated forests, lichen woodlands and lichen heaths avoided during winter. Avoidance of human development (e.g. roads) provided sufficient caribou habitat remains. Habitats in proximity to human development are used in highly disturbed landscapes, presumably because there is no alternative.

Critical Habitat Identification: Pagwachuan (Ontario)

D) Additional Information:

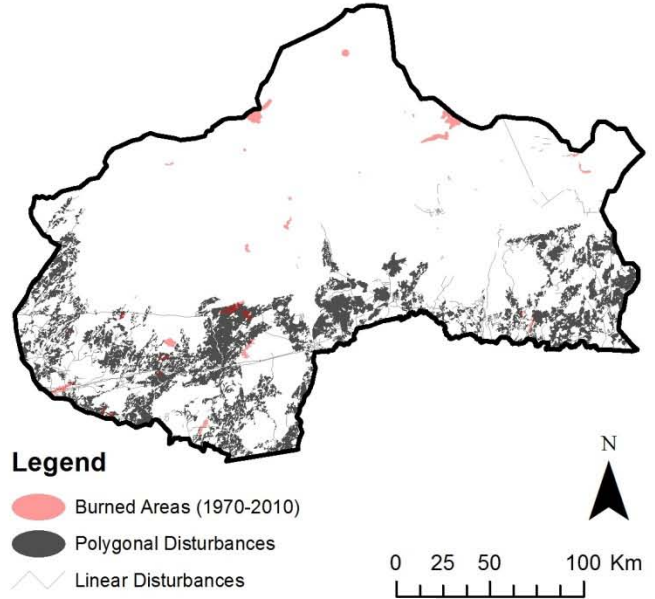


Landcover

- | | | |
|--|---|--|
| ● Water | ○ Shrub | ● Rock Outcrop |
| ● Coniferous Forest | ● Herbaceous | ● Recent Burn |
| ● Deciduous Forest | ● Wetland | ● Old Burn |
| ● Mixed Forest | ● Cropland | ● Built-Up |

MODIS 2005 Landcover (250m Pixels) (Generated by CCRS)
 Legend reclassified by EC
 With NTDB 1:250,000 Hydrology Layer

Disturbances Across Caribou Range



Legend

- Burned Areas (1970-2010)
- Polygonal Disturbances
- Linear Disturbances

*Based on fire data provided by jurisdictions

Disturbance Type and Amount:

- Burned Areas = 1%
- Buffered⁴ Anthropogenic (no reservoirs) = 26%
- Total Habitat Disturbance = 27%⁵

⁴ Buffered means a 500m buffer is applied to linear and polygonal disturbances.
⁵ Total Habitat Disturbance is non-overlapping which means anthropogenic disturbances and burned areas that overlap are not counted twice in the total.

Critical Habitat Identification: Far North (Ontario)

The identification of critical habitat for boreal caribou is described by three factors for each local population: i) Location of habitat; ii) Amount of habitat; and iii) Type of habitat.

A) **Location:** Where critical habitat is found.



Figure 1: Keymap of the general location of the local population (in red).

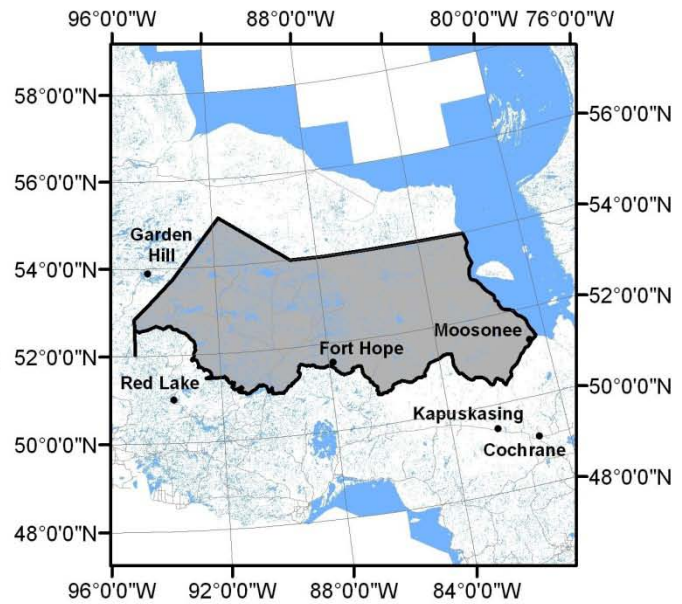


Figure 2: The geographic boundary within which critical habitat is located (in grey).

B) **Amount:** Quantity of critical habitat.

Table 1: Range Attributes and the Amount of Habitat Required

Range Attributes	Range Size	28,265,143 ha
	Population size	Unknown
	Population trend	Unknown
	Total Habitat Disturbance	4,239,771 ha
Range Assessment	Assessment of the current condition of the range to support a self-sustaining local population	Self-Sustaining
Determination of Amount of Habitat	A) Range Size	28,265,143 ha (100%)
	B) Total Habitat Disturbance ¹	4,239,771 ha (15%)
	C) Critical Habitat ²	18,372,343ha (65%)

¹ Total Habitat Disturbance reflects loss of functional habitat. It will be more than the associated disturbance footprint (e.g. 100 ha footprint could lead to 400 ha loss of functional habitat).

² The available undisturbed habitat is more than 65% of the range.

Critical Habitat Identification: Far North (Ontario)

C) **Type:** Biophysical attributes.

Table 1: Biophysical attributes of boreal caribou habitat in the Boreal Shield West ecozone.

Type of selection	Description
Broad scale	Conifer/tamarack-dominated peatland complexes, muskegs or bogs, use dry islands in the middle of muskegs and upland moderate to dense mature conifer forests (jack pine, black spruce, tamarack) with abundant lichens. Hilly or higher ground, lots of smaller lakes in area.
Calving	Peatlands, stands dominated by black spruce, mature forest stands and treed muskeg all used for calving. Caribou will use islands, small lakes, lakeshores during calving.
Post-calving	Wooded lakeshores, islands, sparsely treed rock, upland conifer-spruce and treed muskeg are used in summer. Sites with a high abundance of arboreal lichen are important for foraging in some areas. Dense conifer and mixed forest are also used.
Rutting	Dense and sparse conifer and mixed forests. Open riparian habitats are also used during the rut.
Winter	Mature upland spruce, pine stands and treed muskeg. Jack pine dominated forests. Caribou select sparse and dense conifer, mixed forests and treed bogs. In some areas caribou will select habitat with greater visibility and further away from forest edges.
Travel	Some males move > 100 km during the rutting season. Traditional travel routes between summer and winter ranges occur in large peatland complexes. Caribou migrate in a north to south pattern.
Avoidance	Avoid shrub-rich habitats and hardwood-dominated stands. Avoidance of conifer stands that are not black spruce, deciduous stands, shrub-rich fens and wetlands during calving. Avoid recent burns and disturbed/fragmented areas, including roads.

Table 2: Biophysical attributes of boreal caribou habitat in the Boreal Shield Southeast ecozone.

Type of selection	Description
Broad scale	Late seral-stage black spruce-dominated lowlands and jack pine-dominated uplands, Balsam fir stands, marshlands and abundant lichen.
Calving	Open, medium-closed conifer forests. Elevations of 300 m. Intermediate values of Normalized Difference Vegetation Index. Selection for old (>40 yrs) burns.
Rutting	Dense and open mature conifer forests of spruce, tamarack, jack pine and young conifer forests between 30 – 50 yrs old.
Winter	Open stands of balsam fir, balsam fir-black spruce, black spruce, black-spruce-tamarack and jack pine stands older than 70 yrs. Dry bare lands, 30-50 yrs old stands of balsam fir or fir-black spruce, as well as 50 yr old jack pine stands, and arboreal and terrestrial lichens.
Avoidance	Avoidance of roads and burns <50 yrs old.

Table 3: Biophysical attributes of boreal caribou habitat in the Boreal Shield Central ecozone.

Type of selection	Description
Broad scale	Late seral-stage black spruce-dominated lowlands and jack pine dominated uplands. Open black spruce lowlands. Low-density late seral-stage jack pine or black spruce forests and black spruce/tamarack-dominated peatlands with abundant terrestrial and moderate arboreal lichens. Caribou also use areas with dry to moist sandy to loamy soils and shallow soils over bedrock. Elevations of 300 m. Intermediate values of Normalized Difference Vegetation Index. Selection for old (>40 yrs) burns.
Calving	Open canopies of mature black spruce and mesic peatland with ericaceous species for calving are selected for calving in the Claybelt region. Females with calves selected areas with more abundant ericaceous shrubs and terrestrial lichens during the summer compared to females without calves.

Critical Habitat Identification: Far North (Ontario)

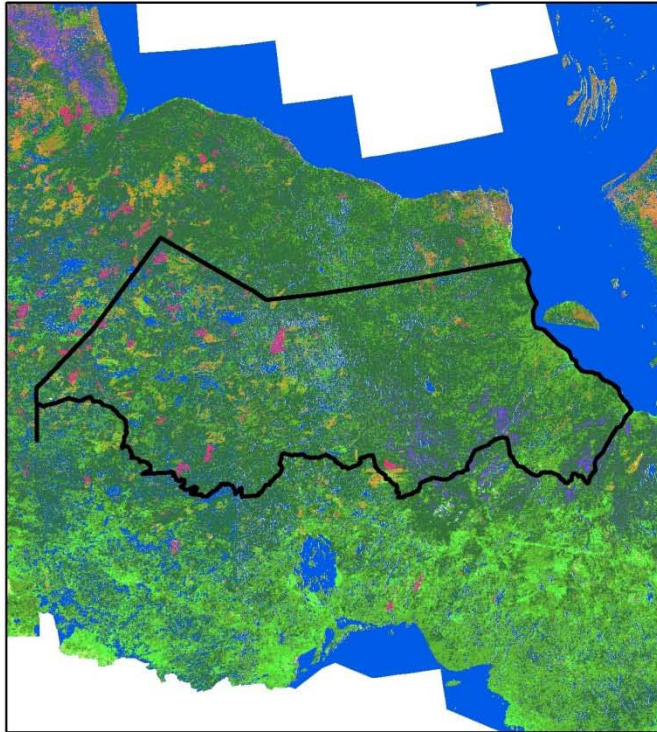
Type of selection	Description
Winter	Large areas of contiguous forests dominated by black spruce. Open conifer forests or forests with lower tree densities where terrestrial and arboreal lichen are abundant and there is significant less snow (e.g. shorelines) are also selected.
Avoidance	Avoid recently downed woody debris, dense shrubs and larch during the calving season. Avoid mixed conifer and deciduous forests in winter. Areas of deep snow are also avoided during winter. Avoidance of roads and burns <40 yrs old.

Table 4: Biophysical attributes of boreal caribou habitat in the Hudson Plains ecozone.

Type of selection	Description
Broad scale	Habitats selected generally to reduce predation risk. Shrub rich treed muskeg and mature conifer forests abundant in lichens. Shorelines of deep lakes and rivers (birch trees). Poorly drained areas dominated by sedges, mosses and lichens, as well as open black spruce and tamarack forests. Elevations of 150m. Intermediate levels of ruggedness and Normalized Difference Vegetation Index.
Calving	Mature conifer stand with and without lichens and muskegs. Preference for higher altitudes compared to habitat use during other periods.
Post-calving	Fens, bogs and lakes.
Rutting	Wetlands and conifer stands with lichen. Mature and regenerating conifer stands are also used, albeit to a lesser degree. Caribou use hills in the lowlands, treed islands in muskegs with several different tree species.
Winter	Dense and mature conifer forests with lichens and wetlands. Peatlands dominated by open bogs and terrestrial lichens. Large patches of intermediate and mature black spruce, shrub-rich treed muskeg and mixed conifer stands all used in late winter.
Travel	Movements greatest in fall/winter when caribou transition from calving to winter habitat. Long range movements are greater in areas with high moose densities, presumably to reduce predation risk.
Avoidance	Avoid herbaceous areas and areas burned within 40 yrs. Deciduous-dominated forests, lichen woodlands and lichen heaths avoided during winter. Avoidance of human development (e.g. roads) provided sufficient caribou habitat remains. Habitats in proximity to human development are used in highly disturbed landscapes, presumably because there is no alternative.

Critical Habitat Identification: Far North (Ontario)

D) Additional Information:

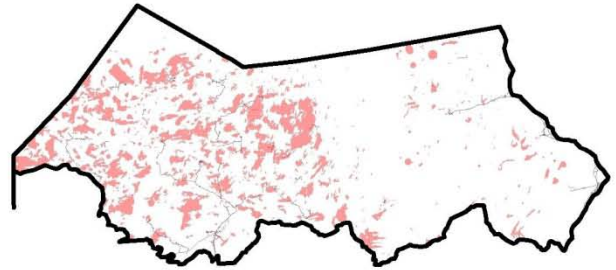


Landcover

- | | | |
|--|---|---|
| ● Water | ● Shrub | ● Rock Outcrop |
| ● Coniferous Forest | ● Herbaceous | ● Recent Burn |
| ● Deciduous Forest | ● Wetland | ● Old Burn |
| ● Mixed Forest | ● Cropland | ● Built-Up |

MODIS 2005 Landcover (250m Pixels) (Generated by CCRS)
 (Legend reclassified by EC)
 With NTDB 1:250,000 Hydrology Layer

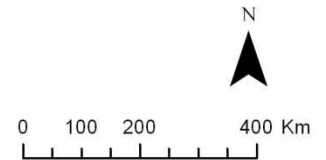
Disturbances Across Caribou Range



Legend

- Burned Areas (1970-2010) *
- Polygonal Disturbances
- Linear Disturbances

* Based on fire data provided by jurisdictions



Disturbance Type and Amount:

Burned Areas = 14%

Buffered⁴ Anthropogenic (no reservoirs) = 1%

Total Habitat Disturbance = 15%⁵

⁴ Buffered means a 500m buffer is applied to linear and polygonal disturbances.

⁵ Total Habitat Disturbance is non-overlapping which means anthropogenic disturbances and burned areas that overlap are not counted twice in the total.

Critical Habitat Identification: Manicouagan (Quebec)

The identification of critical habitat for boreal caribou is described by three factors for each local population: i) Location of habitat; ii) Amount of habitat; and iii) Type of habitat.

A) **Location:** Where critical habitat is found.



Figure 1: Keymap of the general location of the local population (in red).

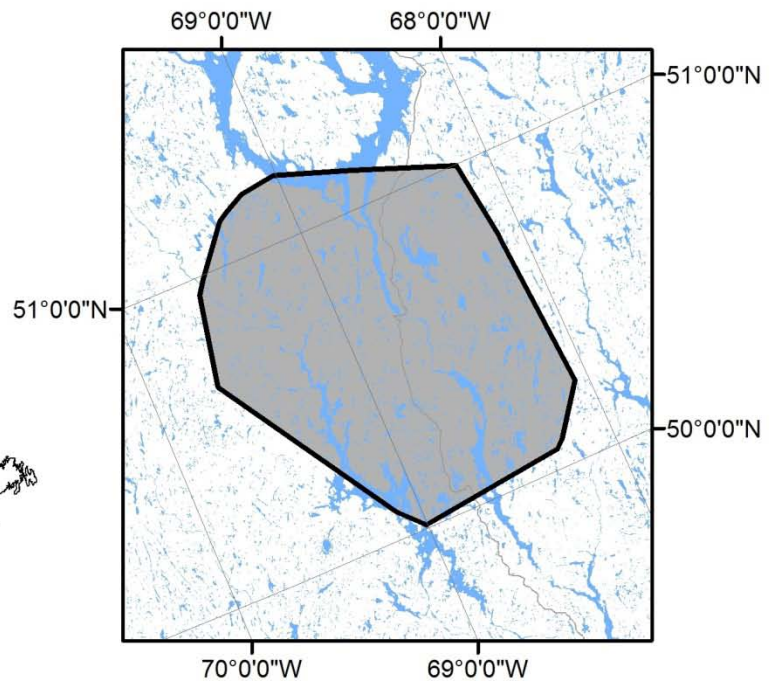


Figure 2: The geographic boundary within which critical habitat is located (in grey).

B) **Amount:** Quantity of critical habitat.

Table 1: Range Attributes and the Amount of Habitat Required

Range Attributes	Range Size	1,134,129 ha
	Population size	181
	Population trend	Increasing
	Total Habitat Disturbance	374,263 ha
Range Assessment	Assessment of the likelihood of the current condition of the range to support a self-sustaining local population	Self-Sustaining
Determination of Amount of Habitat	A) Range Size	1,134,129 ha (100%)
	B) Total Habitat Disturbance ¹	374,263 ha (33%)
	C) Critical Habitat ²	737,184 ha (65%)

¹ Total Habitat Disturbance reflects loss of functional habitat. It will be more than the associated disturbance footprint (e.g. 100 ha footprint could lead to 400 ha loss of functional habitat).

² The available undisturbed habitat is more than 65% of the range.

Critical Habitat Identification: Manicouagan (Quebec)

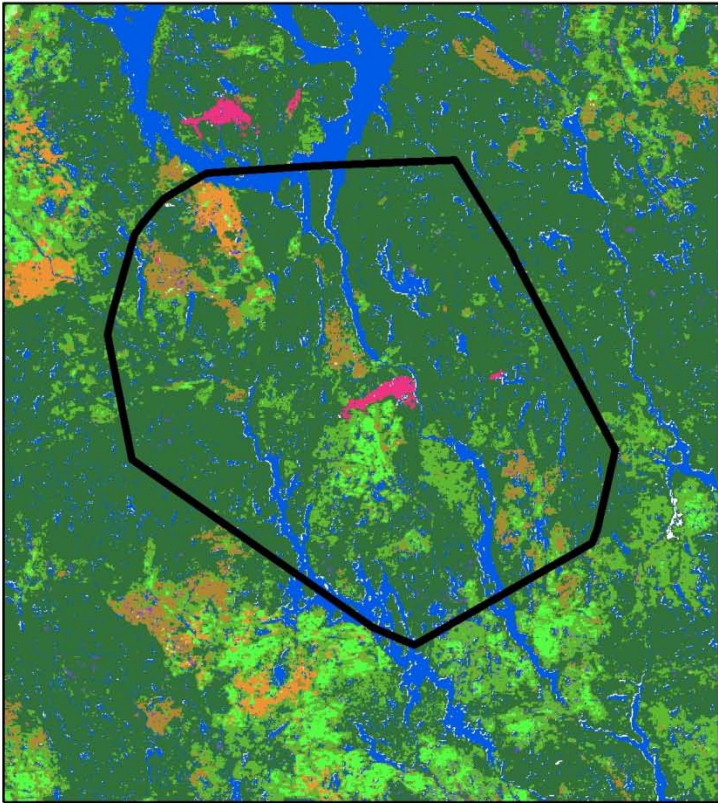
C) **Type:** Biophysical attributes.

Table 1: Biophysical attributes of boreal caribou habitat in the Boreal Shield East ecozone.

Type of selection	Description
Broad scale	<p>Conifer-feather moss forests on poorly-drained sites and mature conifer uplands with abundant terrestrial lichen. black spruce, jack pine and balsam fir stands present with abundant lichen.</p> <p>Water bodies and wetlands (swamps, marshy areas with tamarack).</p> <p>Mountains or rolling hills.</p> <p>Elevations of 300 m.</p> <p>Intermediate values of Normalized Difference Vegetation Index.</p> <p>Selection for old (>40 yrs) burns.</p>
Calving	<p>Open wetlands, peninsulas and islands.</p> <p>Sedges, ericaceous species, bryophytes, alder and larch selected in spring.</p> <p>Balsam fir, dense black spruce stands, spruce-fir forests older than 40 yrs, and dry bare land with high lichen densities.</p> <p>Mature conifer stands, as well as wetlands (marshes, peat moss areas). Higher altitudes used for calving in this area rather than lake or water bodies.</p>
Post-calving	<p>Open and forested wetlands (marshes, swamps), and continued use of peninsulas and islands. Hilly areas, coastal sites, shorelines (rivers, lakes, creeks).</p> <p>Aquatic plants, dwarf birch (<i>Betula glandulosa</i>), deciduous shrubs, ericaceous species and moss.</p>
Rutting	<p>Open wetlands selected, swamps.</p> <p>Terrestrial and arboreal lichens, forbs, sedges, mosses and coniferous and deciduous shrubs.</p> <p>Balsam fir stands, dense spruce stands, mature and regenerating conifer stands, other forest stands (tamarack, pine) with abundant lichens, wetlands (swamps) and dry bare lands.</p>
Winter	<p>Forested wetlands. Some use of upland-tundra for loafing. Mountainous terrain.</p> <p>Dry bare land, wetlands, mature conifer forests with lichen, balsam fir stands, dense spruce stands, and mixed spruce-fir forests older than 40 yrs selected in southern areas. Observed along frozen bodies of water.</p> <p>Use of mature forests protected from harvesting increases probability of encounters with wolves that select the same habitats in winter.</p> <p>Shallow snow depths selected in late winter.</p>
Travel	<p>Caribou move greater distances during the rutting season.</p>
Avoidance	<p>Avoid deciduous and mixed forests, jack pine forests less than 40 yrs old and heaths without lichens all year round.</p> <p>Avoid disturbed habitats, including roads, recreational areas, burns and clear-cuts or harvested areas used by wolves.</p>

Critical Habitat Identification: Manicouagan (Quebec)

D) Additional Information:

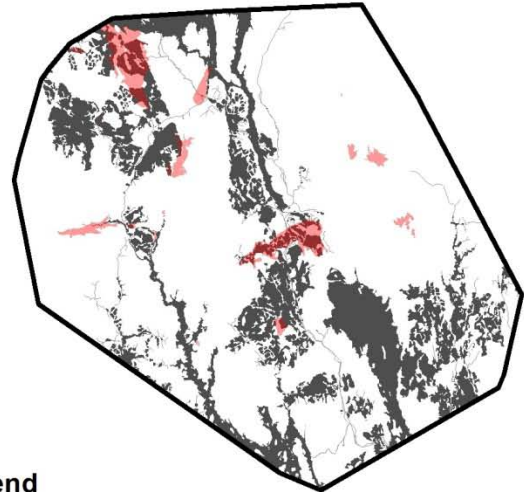


Landcover

- | | | |
|-------------------|------------|--------------|
| Water | Shrub | Rock Outcrop |
| Coniferous Forest | Herbaceous | Recent Burn |
| Deciduous Forest | Wetland | Old Burn |
| Mixed Forest | Cropland | Built-Up |

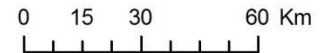
MODIS 2005 Landcover (250m Pixels) (Generated by CCRS)
 Legend reclassified by EC
 With NTDB 1:250,000 Hydrology Layer

Disturbances Across Caribou Range



Legend

- Burned Areas (1970-2010)
- Polygonal Disturbances
- Linear Disturbances



*Based on fire data provided by jurisdictions

Disturbance Type and Amount:

- Burned Areas = 3%
- Buffered³ Anthropogenic (no reservoirs) = 32%
- Total Habitat Disturbance = 33%⁴

⁴ Buffered means a 500m buffer is applied to linear and polygonal disturbances.
⁵ Total Habitat Disturbance is non-overlapping which means anthropogenic disturbances and burned areas that overlap are not counted twice in the total.

Critical Habitat Identification: Quebec (Quebec)

The identification of critical habitat for boreal caribou is described by three factors for each local population: i) Location of habitat; ii) Amount of habitat; and iii) Type of habitat.

A) **Location:** Where critical habitat is found.

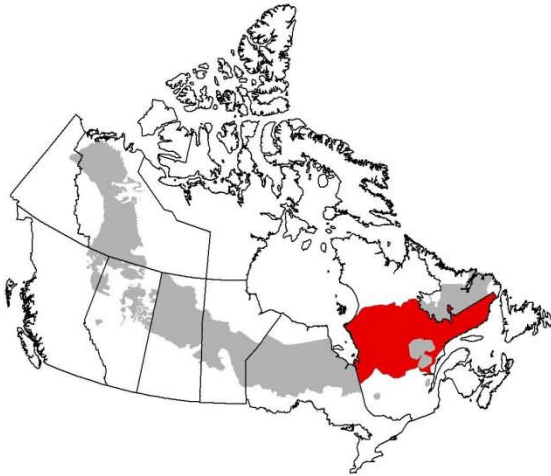


Figure 1: Keymap of the general location of the local population (in red).

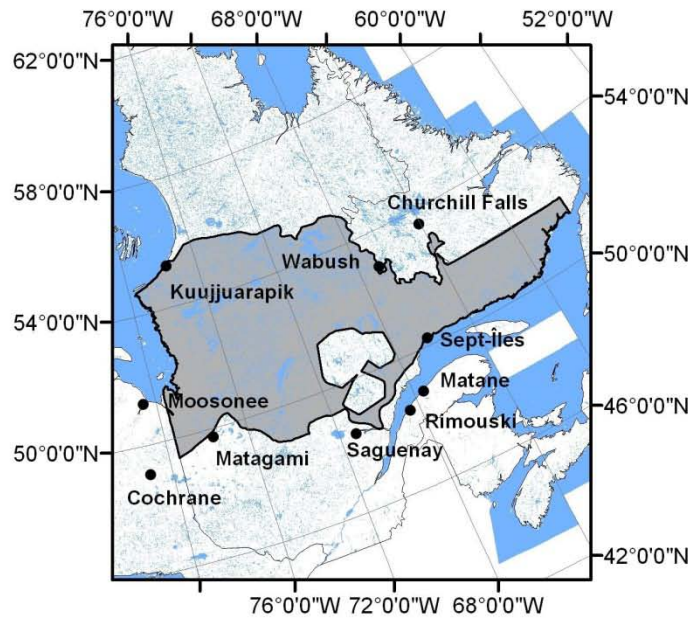


Figure 2: The geographic boundary within which critical habitat is located (in grey).

B) **Amount:** Quantity of critical habitat.

Table 1: Range Attributes and the Amount of Habitat Required

Range Attributes	Range Size	62,156,186 ha
	Population size	9000
	Population trend	Stable
	Total Habitat Disturbance	18,646,856 ha
Range Assessment	Assessment of the likelihood of the current condition of the range to support a self-sustaining local population	Self-Sustaining
Determination of Amount of Habitat	A) Range Size	62,156,186 ha (100%)
	B) Total Habitat Disturbance ¹	18,646,856 ha (30%)
	C) Critical Habitat ²	40,401,521 ha (65%)
¹ Total Habitat Disturbance reflects loss of functional habitat. It will be more than the associated disturbance footprint (e.g. 100 ha footprint could lead to 400 ha loss of functional habitat).		
² The available undisturbed habitat is more than 65% of the range.		

Critical Habitat Identification: Quebec (Quebec)

C) **Type:** Biophysical attributes.

Table 1: Biophysical attributes of boreal caribou habitat in the Boreal Shield East ecozone.

Type of selection	Description
Broad scale	Conifer-feather moss forests on poorly-drained sites and mature conifer uplands with abundant terrestrial lichen. black spruce, jack pine and balsam fir stands present with abundant lichen. Water bodies and wetlands (swamps, marshy areas with tamarack). Mountains or rolling hills. Elevations of 300 m. Intermediate values of Normalized Difference Vegetation Index. Selection for old (>40 yrs) burns.
Calving	Open wetlands, peninsulas and islands. Sedges, ericaceous species, bryophytes, alder and larch selected in spring. Balsam fir, dense black spruce stands, spruce-fir forests older than 40 yrs, and dry bare land with high lichen densities. Mature conifer stands, as well as wetlands (marshes, peat moss areas). Higher altitudes used for calving in this area rather than lake or water bodies.
Post-calving	Open and forested wetlands (marshes, swamps), and continued use of peninsulas and islands. Hilly areas, coastal sites, shorelines (rivers, lakes, creeks). Aquatic plants, dwarf birch (<i>Betula glandulosa</i>), deciduous shrubs, ericaceous species and moss.
Rutting	Open wetlands selected, swamps. Terrestrial and arboreal lichens, forbs, sedges, mosses and coniferous and deciduous shrubs. Balsam fir stands, dense spruce stands, mature and regenerating conifer stands, other forest stands (tamarack, pine) with abundant lichens, wetlands (swamps) and dry bare lands.
Winter	Forested wetlands. Some use of upland-tundra for loafing. Mountainous terrain. Dry bare land, wetlands, mature conifer forests with lichen, balsam fir stands, dense spruce stands, and mixed spruce-fir forests older than 40 yrs selected in southern areas. Observed along frozen bodies of water. Use of mature forests protected from harvesting increases probability of encounters with wolves that select the same habitats in winter. Shallow snow depths selected in late winter.
Travel	Caribou move greater distances during the rutting season.
Avoidance	Avoid deciduous and mixed forests, jack pine forests less than 40 yrs old and heaths without lichens all year round. Avoid disturbed habitats, including roads, recreational areas, burns and clear-cuts or harvested areas used by wolves.

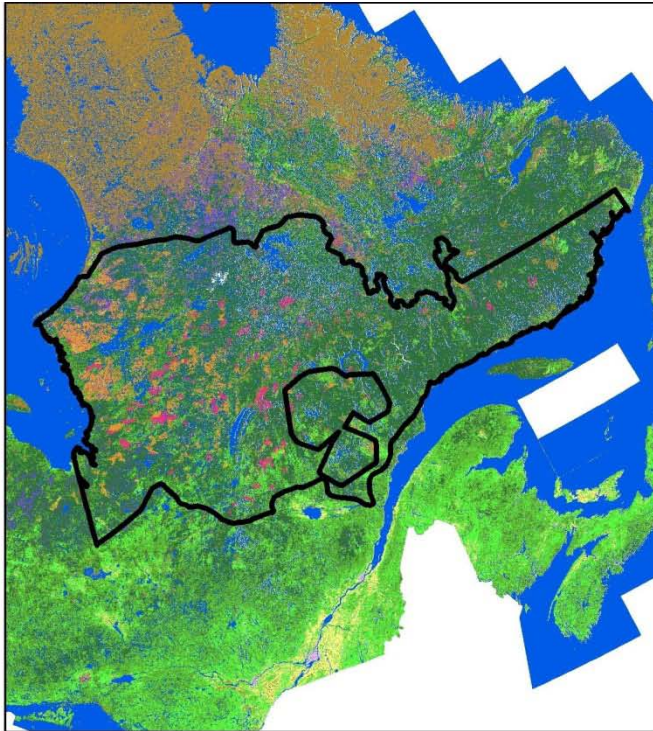
Table 2: Biophysical attributes of boreal caribou habitat in the Boreal Shield Central ecozone.

Type of selection	Description
Broad scale	Late seral-stage black spruce-dominated lowlands and jack pine dominated uplands. Open black spruce lowlands. Low-density late seral-stage jack pine or black spruce forests and black spruce/tamarack-dominated peatlands with abundant terrestrial and moderate arboreal lichens. Caribou also use areas with dry to moist sandy to loamy soils and shallow soils over bedrock. Elevations of 300 m. Intermediate values of Normalized Difference Vegetation Index. Selection for old (>40 yrs) burns.
Calving	Open canopies of mature black spruce and mesic peatland with ericaceous species for calving are selected for calving in the Claybelt region. Females with calves selected areas with more abundant ericaceous shrubs and terrestrial lichens during the summer compared to females without calves.
Winter	Large areas of contiguous forests dominated by black spruce. Open conifer forests or forests with lower tree densities where terrestrial and arboreal lichen are abundant and there is significant less snow (e.g. shorelines) are also selected.
Avoidance	Avoid recently downed woody debris, dense shrubs and larch during the calving season. Avoid mixed conifer and deciduous forests in winter. Areas of deep snow are also avoided during winter.

Critical Habitat Identification: Quebec (Quebec)

Type of selection	Description
	Avoidance of roads and burns <40 yrs old.

D) Additional Information:

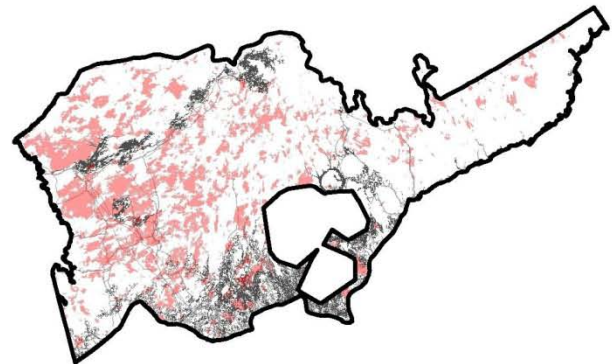


Landcover

- Water
- Coniferous Forest
- Deciduous Forest
- Mixed Forest
- Shrub
- Herbaceous
- Wetland
- Cropland
- Rock Outcrop
- Recent Burn
- Old Burn
- Built-Up

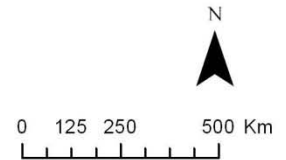
MODIS 2005 Landcover (250m Pixels) (Generated by CCRS)
 (Legend reclassified by EC)
 With NTDB 1:250,000 Hydrology Layer

Disturbances Across Caribou Range



Legend

- Burned Areas (1970-2010) *
- Polygonal Disturbances
- Linear Disturbances



* Based on fire data provided by jurisdictions

Disturbance Type and Amount:

Burned Areas = 20%
 Buffered⁴ Anthropogenic (no reservoirs) = 12%
 Total Habitat Disturbance = 30%⁵

⁴ Buffered means a 500m buffer is applied to linear and polygonal disturbances.

⁵ Total Habitat Disturbance is non-overlapping which means anthropogenic disturbances and burned areas that overlap are not counted twice in the total.

Critical Habitat Identification: Lac Joseph (Labrador)

The identification of critical habitat for boreal caribou is described by three factors for each local population: i) Location of habitat; ii) Amount of habitat; and iii) Type of habitat.

A) **Location:** Where critical habitat is found.



Figure 1: Keymap of the general location of the local population (in red).

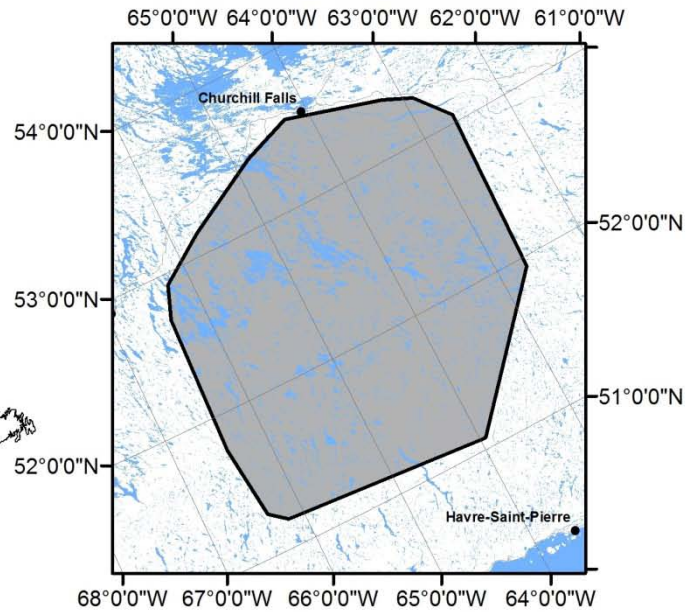


Figure 2: The geographic boundary within which critical habitat is located (in grey).

B) **Amount:** Quantity of critical habitat.

Table 1: Range Attributes and the Amount of Habitat Required

Range Attributes	Range Size	5,802,491 ha
	Population size	1101
	Population trend	Unknown
	Total Habitat Disturbance	464,199 ha
Range Assessment	Assessment of the current condition of the range to support a self-sustaining local population	Self-Sustaining
Determination of Amount of Habitat	A) Range Size	5,802,491 ha (100%)
	B) Total Habitat Disturbance ¹	464,199 ha (8%)
	C) Critical Habitat ²	3,771,619ha (65%)

¹ Total Habitat Disturbance reflects loss of functional habitat. It will be more than the associated disturbance footprint (e.g. 100 ha footprint could lead to 400 ha loss of functional habitat).

² The available undisturbed habitat is more than 65% of the range.

Critical Habitat Identification: Lac Joseph (Labrador)

C) **Type:** Biophysical attributes.

Table 1: Biophysical attributes of boreal caribou habitat in the Boreal Shield East ecozone.

Type of selection	Description
Broad scale	Conifer-feather moss forests on poorly-drained sites and mature conifer uplands with abundant terrestrial lichen. black spruce, jack pine and balsam fir stands present with abundant lichen. Water bodies and wetlands (swamps, marshy areas with tamarack). Mountains or rolling hills. Elevations of 300 m. Intermediate values of Normalized Difference Vegetation Index. Selection for old (>40 yrs) burns.
Calving	Open wetlands, peninsulas and islands. Sedges, ericaceous species, bryophytes, alder and larch selected in spring. Balsam fir, dense black spruce stands, spruce-fir forests older than 40 yrs, and dry bare land with high lichen densities. Mature conifer stands, as well as wetlands (marshes, peat moss areas). Higher altitudes used for calving in this area rather than lake or water bodies.
Post-calving	Open and forested wetlands (marshes, swamps), and continued use of peninsulas and islands. Hilly areas, coastal sites, shorelines (rivers, lakes, creeks). Aquatic plants, dwarf birch (<i>Betula glandulosa</i>), deciduous shrubs, ericaceous species and moss.
Rutting	Open wetlands selected, swamps. Terrestrial and arboreal lichens, forbs, sedges, mosses and coniferous and deciduous shrubs. Balsam fir stands, dense spruce stands, mature and regenerating conifer stands, other forest stands (tamarack, pine) with abundant lichens, wetlands (swamps) and dry bare lands.
Winter	Forested wetlands. Some use of upland-tundra for loafing. Mountainous terrain. Dry bare land, wetlands, mature conifer forests with lichen, balsam fir stands, dense spruce stands, and mixed spruce-fir forests older than 40 yrs selected in southern areas. Observed along frozen bodies of water. Use of mature forests protected from harvesting increases probability of encounters with wolves that select the same habitats in winter. Shallow snow depths selected in late winter.
Travel	Caribou move greater distances during the rutting season.
Avoidance	Avoid deciduous and mixed forests, jack pine forests less than 40 yrs old and heaths without lichens all year round. Avoid disturbed habitats, including roads, recreational areas, burns and clear-cuts or harvested areas used by wolves.

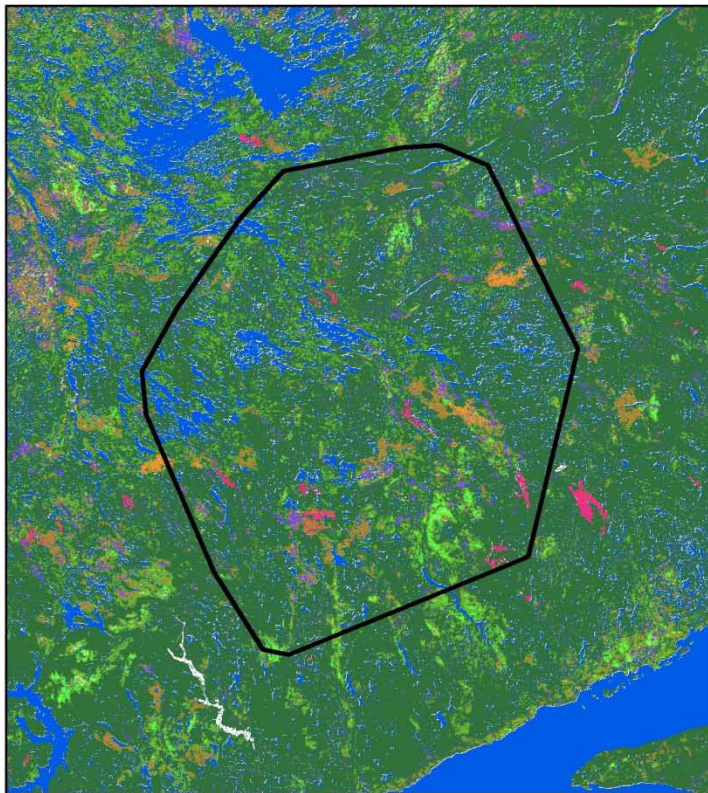
Table 2: Biophysical attributes of boreal caribou habitat in the Taiga Shield ecozone.

Type of selection	Description
Broad scale	Upland tundra dominated by ericaceous shrubs (<i>Ericaceae</i> spp.), lichen, grasses and sedges. Lowland tundra composed of peatland complexes (muskeg and string bogs), wetlands (swamps, marshes), lakes, rivers and riparian valleys. Dense mature jack pine and black spruce stands with balsam fir and tamarack present and open conifer forests with abundant lichens.
Calving	String bogs, treed bogs, small open wetlands (< 1 km ²), large muskeg, marshes along water bodies. Barren grounds. Calving on peninsulas and islands increases with amount of open water.
Post-calving	Forested wetlands. Hilly areas, coastal sites, along shorelines of water bodies (rivers, lakes, creeks), marshes with lichen availability.
Rutting	Open wetlands, swamps. Mature forests, mountainous terrain with forests of black spruce, tamarack and pine trees with abundant lichen.
Winter	Forested areas are used in years of low snow accumulation otherwise winter habitat selection reflects general avoidance of deep snow, including use of tundra habitat at higher elevations in mountainous regions and bogs along lakes or oceans. Forested wetlands. Tundra uplands and sand flats in proximity to water. Barren grounds. Bog edges, glacial erratics and bedrock erratics with lichen, and lakes for loafing or ruminating.

Critical Habitat Identification: Lac Joseph (Labrador)

Type of selection	Description
	Some use of mature white spruce and fir stands as alternative to habitat with arboreal lichens. Mix of Mature forest stands, mountainous terrain with forests of black spruce, tamarack and jack pine with abundant lichen.
Travel	Connectivity between selected habitat types important given reported patterns of movement among caribou. Some females travel 200 to 500 km from winter areas to calving sites. Females show fidelity to post-calving sites returning to within 6.7 km of a given location in consecutive years.
Avoidance	Avoidance of roads and areas recently burned.

D) Additional Information:

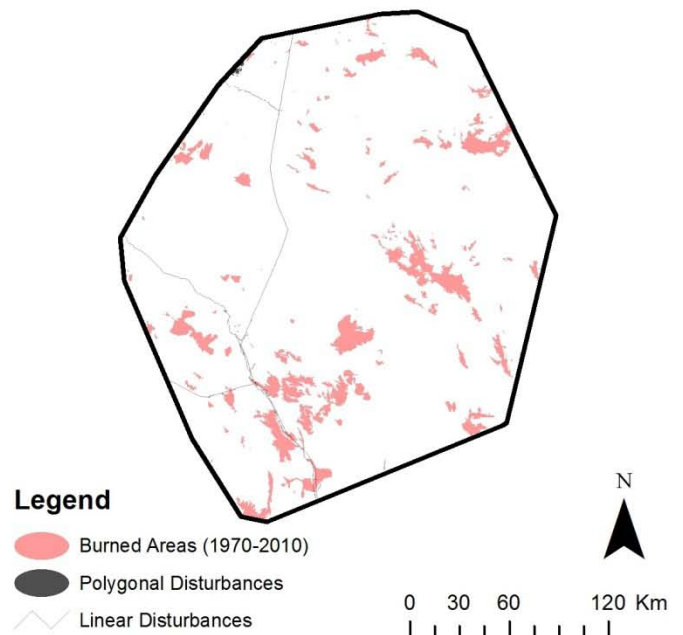


Landcover

- Water (Blue)
- Shrub (Light Green)
- Rock Outcrop (Brown)
- Coniferous Forest (Dark Green)
- Herbaceous (Light Brown)
- Recent Burn (Pink)
- Deciduous Forest (Light Green)
- Wetland (Purple)
- Old Burn (Orange)
- Mixed Forest (Medium Green)
- Cropland (Yellow)
- Built-Up (Light Purple)

MODIS 2005 Landcover (250m Pixels) (Generated by CCRS)
 Legend reclassified by EC
 With NTDB 1:250,000 Hydrology Layer

Disturbances Across Caribou Range



*Based on fire data provided by jurisdictions

Disturbance Type and Amount:

Burned Areas = 7%
 Buffered⁴ Anthropogenic (no reservoirs) = 1%
 Total Habitat Disturbance = 8%⁵

⁴ Buffered means a 500m buffer is applied to linear and polygonal disturbances.
⁵ Total Habitat Disturbance is non-overlapping which means anthropogenic disturbances and burned areas that overlap are not counted twice in the total.

Critical Habitat Identification: Mealy Mountain (Labrador)

The identification of critical habitat for boreal caribou is described by three factors for each local population: i) Location of habitat; ii) Amount of habitat; and iii) Type of habitat.

A) **Location:** Where critical habitat is found.

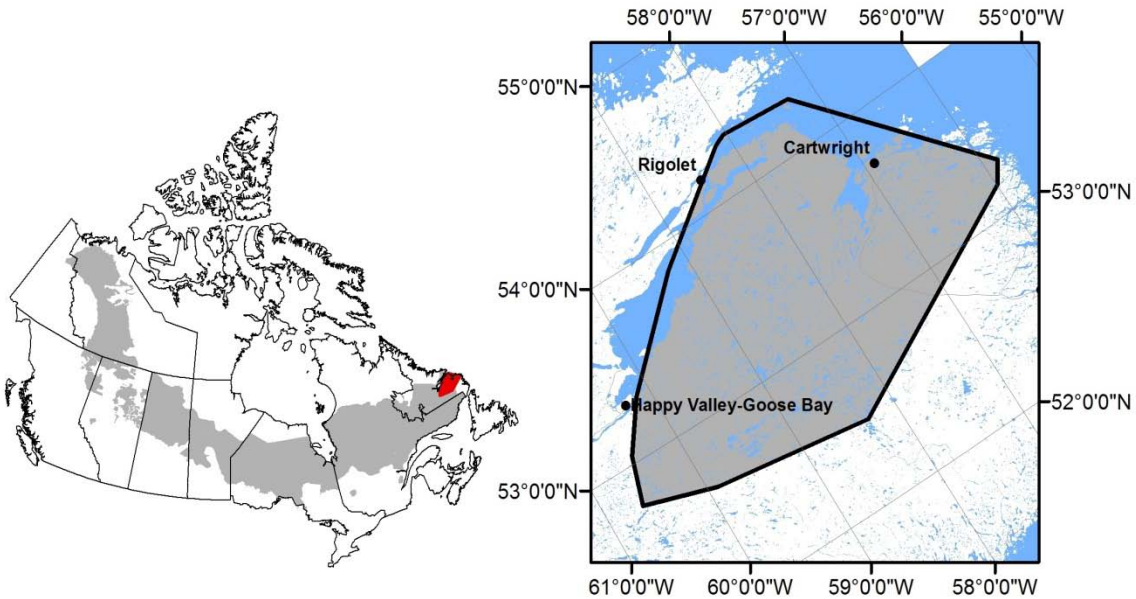


Figure 1: Keymap of the general location of the local population (in red).

Figure 2: The geographic boundary within which critical habitat is located (in grey).

B) **Amount:** Quantity of critical habitat.

Table 1: Range Attributes and the Amount of Habitat Required

Range Attributes	Range Size	3,948,463 ha
	Population size	2106
	Population trend	Stable
	Total Habitat Disturbance	78,969 ha
Range Assessment	Assessment of the likelihood of the current condition of the range to support a self-sustaining local population	Self-Sustaining
Determination of Amount of Habitat	A) Range Size	3,948,463 ha (100%)
	B) Total Habitat Disturbance ¹	78,969 ha (2%)
	C) Critical Habitat ²	2,566,501ha (65%)

¹ Total Habitat Disturbance reflects loss of functional habitat. It will be more than the associated disturbance footprint (e.g. 100 ha footprint could lead to 400 ha loss of functional habitat).

² The available undisturbed habitat is more than 65% of the range.

Critical Habitat Identification: Mealy Mountain (Labrador)

C) **Type:** Biophysical attributes.

Table 1: Biophysical attributes of boreal caribou habitat in the Boreal Shield East ecozone.

Type of selection	Description
Broad scale	Conifer-feather moss forests on poorly-drained sites and mature conifer uplands with abundant terrestrial lichen. black spruce, jack pine and balsam fir stands present with abundant lichen. Water bodies and wetlands (swamps, marshy areas with tamarack). Mountains or rolling hills. Elevations of 300 m. Intermediate values of Normalized Difference Vegetation Index. Selection for old (>40 yrs) burns.
Calving	Open wetlands, peninsulas and islands. Sedges, ericaceous species, bryophytes, alder and larch selected in spring. Balsam fir, dense black spruce stands, spruce-fir forests older than 40 yrs, and dry bare land with high lichen densities. Mature conifer stands, as well as wetlands (marshes, peat moss areas). Higher altitudes used for calving in this area rather than lake or water bodies.
Post-calving	Open and forested wetlands (marshes, swamps), and continued use of peninsulas and islands. Hilly areas, coastal sites, shorelines (rivers, lakes, creeks). Aquatic plants, dwarf birch (<i>Betula glandulosa</i>), deciduous shrubs, ericaceous species and moss.
Rutting	Open wetlands selected, swamps. Terrestrial and arboreal lichens, forbs, sedges, mosses and coniferous and deciduous shrubs. Balsam fir stands, dense spruce stands, mature and regenerating conifer stands, other forest stands (tamarack, pine) with abundant lichens, wetlands (swamps) and dry bare lands.
Winter	Forested wetlands. Some use of upland-tundra for loafing. Mountainous terrain. Dry bare land, wetlands, mature conifer forests with lichen, balsam fir stands, dense spruce stands, and mixed spruce-fir forests older than 40 yrs selected in southern areas. Observed along frozen bodies of water. Use of mature forests protected from harvesting increases probability of encounters with wolves that select the same habitats in winter. Shallow snow depths selected in late winter.
Travel	Caribou move greater distances during the rutting season.
Avoidance	Avoid deciduous and mixed forests, jack pine forests less than 40 yrs old and heaths without lichens all year round. Avoid disturbed habitats, including roads, recreational areas, burns and clear-cuts or harvested areas used by wolves.

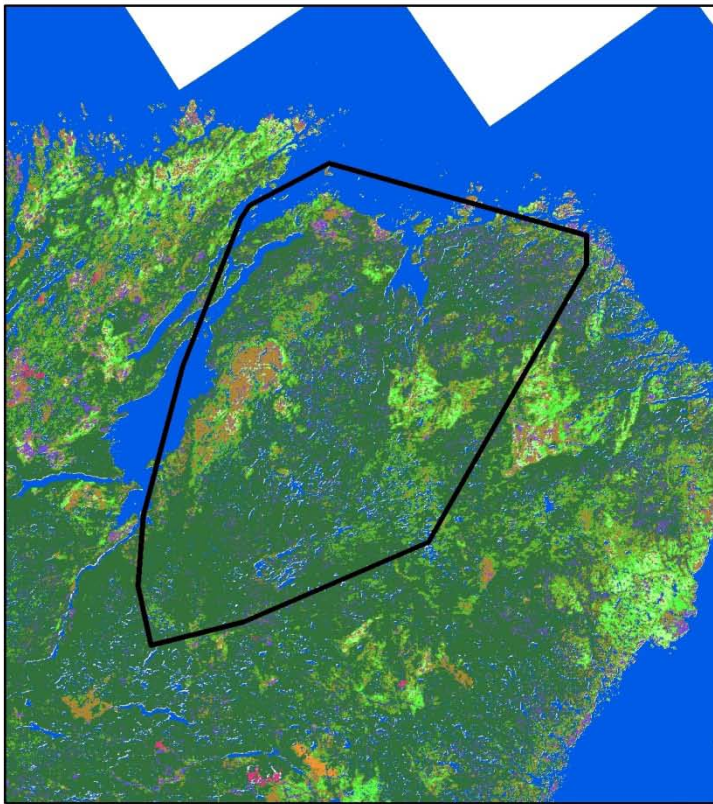
Table 2: Biophysical attributes of boreal caribou habitat in the Taiga Shield ecozone.

Type of selection	Description
Broad scale	Upland tundra dominated by ericaceous shrubs (<i>Ericaceae</i> spp.), lichen, grasses and sedges. Lowland tundra composed of peatland complexes (muskeg and string bogs), wetlands (swamps, marshes), lakes, rivers and riparian valleys. Dense mature jack pine and black spruce stands with balsam fir and tamarack present and open conifer forests with abundant lichens.
Calving	String bogs, treed bogs, small open wetlands (< 1 km ²), large muskeg, marshes along water bodies. Barren grounds. Calving on peninsulas and islands increases with amount of open water.
Post-calving	Forested wetlands. Hilly areas, coastal sites, along shorelines of water bodies (rivers, lakes, creeks), marshes with lichen availability.
Rutting	Open wetlands, swamps. Mature forests, mountainous terrain with forests of black spruce, tamarack and pine trees with abundant lichen.
Winter	Forested areas are used in years of low snow accumulation otherwise winter habitat selection reflects general avoidance of deep snow, including use of tundra habitat at higher elevations in mountainous regions and bogs along lakes or oceans. Forested wetlands. Tundra uplands and sand flats in proximity to water. Barren grounds. Bog edges, glacial erratics and bedrock erratics with lichen, and lakes for loafing or ruminating.

Critical Habitat Identification: Mealy Mountain (Labrador)

Type of selection	Description
	Some use of mature white spruce and fir stands as alternative to habitat with arboreal lichens. Mix of Mature forest stands, mountainous terrain with forests of black spruce, tamarack and jack pine with abundant lichen.
Travel	Connectivity between selected habitat types important given reported patterns of movement among caribou. Some females travel 200 to 500 km from winter areas to calving sites. Females show fidelity to post-calving sites returning to within 6.7 km of a given location in consecutive years.
Avoidance	Avoidance of roads and areas recently burned.

D) Additional Information:

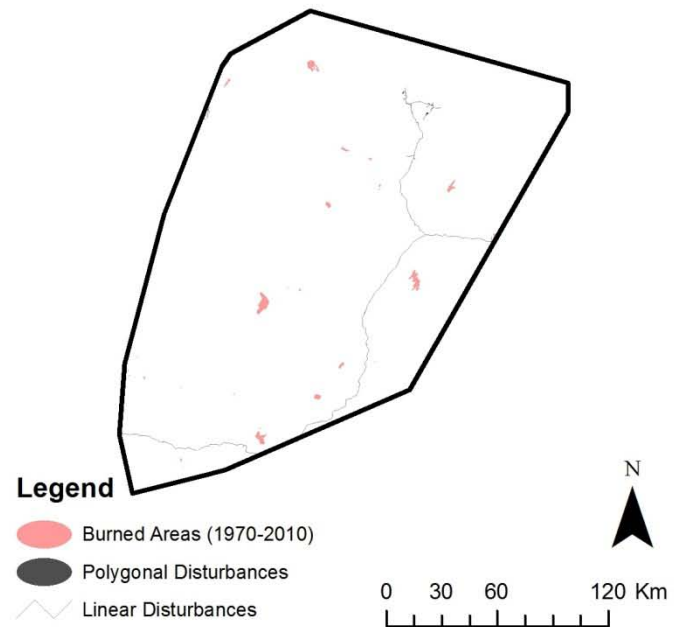


Landcover

- Water
- Coniferous Forest
- Deciduous Forest
- Mixed Forest
- Shrub
- Herbaceous
- Wetland
- Cropland
- Rock Outcrop
- Recent Burn
- Old Burn
- Built-Up

MODIS 2005 Landcover (250m Pixels) (Generated by CCRS)
 Legend reclassified by EC
 With NTDB 1:250,000 Hydrology Layer

Disturbances Across Caribou Range



*Based on fire data provided by jurisdictions

Disturbance Type and Amount:

Burned Areas = 0.4%
 Buffered⁴ Anthropogenic (no reservoirs) = 1%
 Total Habitat Disturbance = 2%⁵

⁴ Buffered means a 500m buffer is applied to linear and polygonal disturbances.

⁵ Total Habitat Disturbance is non-overlapping which means anthropogenic disturbances and burned areas that overlap are not counted twice in the total.

Critical Habitat Identification: Labrador

The identification of critical habitat for boreal caribou is described by three factors for each local population: i) Location of habitat; ii) Amount of habitat; and iii) Type of habitat.

A) **Location:** Where critical habitat is found.

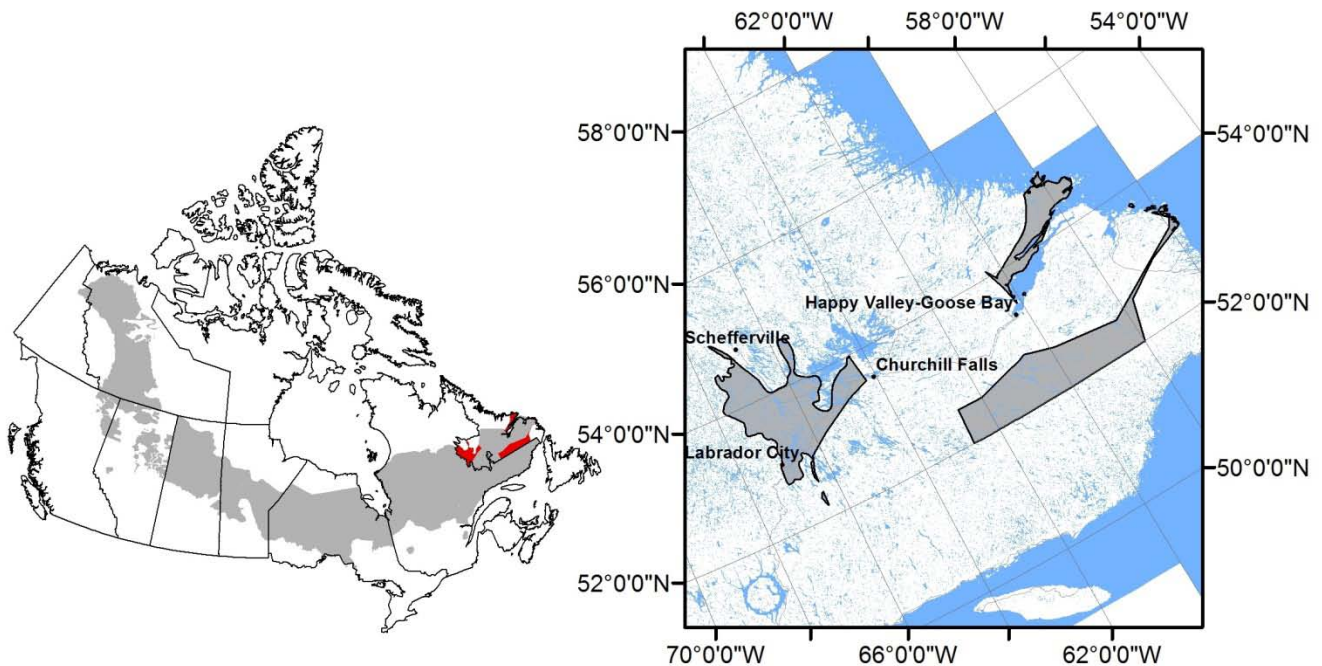


Figure 1: Keymap of the general location of the local population (in red).

Figure 2: The geographic boundary within which critical habitat is located (in grey).

B) **Amount:** Quantity of critical habitat.

Table 1: Range Attributes and the Amount of Habitat Required

Range Attributes	Range Size	5,177,187 ha
	Population size	Unknown
	Population trend	Unknown
	Total Habitat Disturbance	465,947 ha
Range Assessment	Assessment of the current condition of the range to support a self-sustaining local population	Self-Sustaining
Determination of Amount of Habitat	A) Range Size	5,177,187 ha (100%)
	B) Total Habitat Disturbance ¹	465,947 ha (9%)
	C) Critical Habitat ²	3,365,172 ha (65%)

¹ Total Habitat Disturbance reflects loss of functional habitat. It will be more than the associated disturbance footprint (e.g. 100 ha footprint could lead to 400 ha loss of functional habitat).

² The available undisturbed habitat is more than 65% of the range.

Critical Habitat Identification: Labrador

C) **Type:** Biophysical attributes.

Table 1: Biophysical attributes of boreal caribou habitat in the Boreal Shield East ecozone.

Type of selection	Description
Broad scale	Conifer-feather moss forests on poorly-drained sites and mature conifer uplands with abundant terrestrial lichen. black spruce, jack pine and balsam fir stands present with abundant lichen. Water bodies and wetlands (swamps, marshy areas with tamarack). Mountains or rolling hills. Elevations of 300 m. Intermediate values of Normalized Difference Vegetation Index. Selection for old (>40 yrs) burns.
Calving	Open wetlands, peninsulas and islands. Sedges, ericaceous species, bryophytes, alder and larch selected in spring. Balsam fir, dense black spruce stands, spruce-fir forests older than 40 yrs, and dry bare land with high lichen densities. Mature conifer stands, as well as wetlands (marshes, peat moss areas). Higher altitudes used for calving in this area rather than lake or water bodies.
Post-calving	Open and forested wetlands (marshes, swamps), and continued use of peninsulas and islands. Hilly areas, coastal sites, shorelines (rivers, lakes, creeks). Aquatic plants, dwarf birch (<i>Betula glandulosa</i>), deciduous shrubs, ericaceous species and moss.
Rutting	Open wetlands selected, swamps. Terrestrial and arboreal lichens, forbs, sedges, mosses and coniferous and deciduous shrubs. Balsam fir stands, dense spruce stands, mature and regenerating conifer stands, other forest stands (tamarack, pine) with abundant lichens, wetlands (swamps) and dry bare lands.
Winter	Forested wetlands. Some use of upland-tundra for loafing. Mountainous terrain. Dry bare land, wetlands, mature conifer forests with lichen, balsam fir stands, dense spruce stands, and mixed spruce-fir forests older than 40 yrs selected in southern areas. Observed along frozen bodies of water. Use of mature forests protected from harvesting increases probability of encounters with wolves that select the same habitats in winter. Shallow snow depths selected in late winter.
Travel	Caribou move greater distances during the rutting season.
Avoidance	Avoid deciduous and mixed forests, jack pine forests less than 40 yrs old and heaths without lichens all year round. Avoid disturbed habitats, including roads, recreational areas, burns and clear-cuts or harvested areas used by wolves.

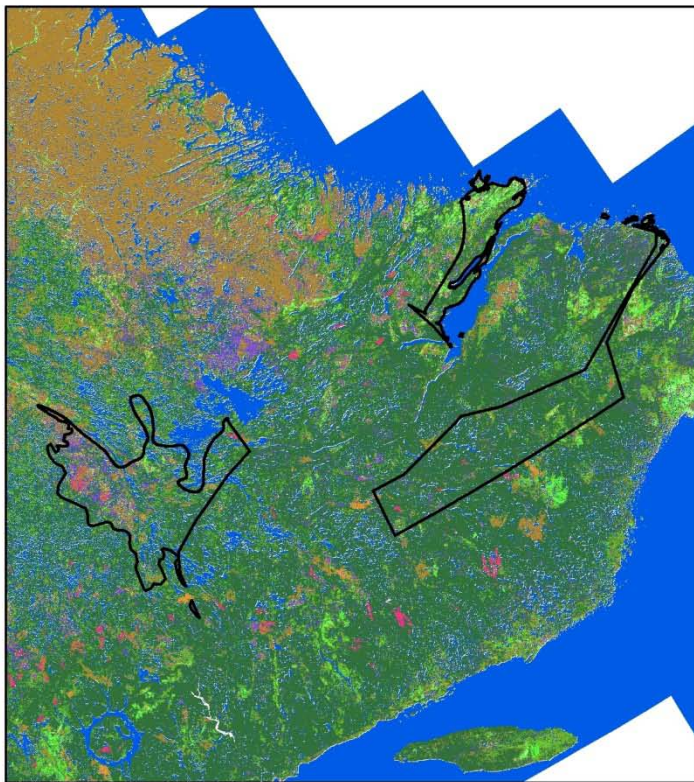
Table 2: Biophysical attributes of boreal caribou habitat in the Taiga Shield ecozone.

Type of selection	Description
Broad scale	Upland tundra dominated by ericaceous shrubs (<i>Ericaceae</i> spp.), lichen, grasses and sedges. Lowland tundra composed of peatland complexes (muskeg and string bogs), wetlands (swamps, marshes), lakes, rivers and riparian valleys. Dense mature jack pine and black spruce stands with balsam fir and tamarack present and open conifer forests with abundant lichens.
Calving	String bogs, treed bogs, small open wetlands (< 1 km ²), large muskeg, marshes along water bodies. Barren grounds. Calving on peninsulas and islands increases with amount of open water.
Post-calving	Forested wetlands. Hilly areas, coastal sites, along shorelines of water bodies (rivers, lakes, creeks), marshes with lichen availability.
Rutting	Open wetlands, swamps. Mature forests, mountainous terrain with forests of black spruce, tamarack and pine trees with abundant lichen.

Critical Habitat Identification: Labrador

Type of selection	Description
Winter	<p>Forested areas are used in years of low snow accumulation otherwise winter habitat selection reflects general avoidance of deep snow, including use of tundra habitat at higher elevations in mountainous regions and bogs along lakes or oceans.</p> <p>Forested wetlands.</p> <p>Tundra uplands and sand flats in proximity to water. Barren grounds.</p> <p>Bog edges, glacial erratics and bedrock erratics with lichen, and lakes for loafing or ruminating.</p> <p>Some use of mature white spruce and fir stands as alternative to habitat with arboreal lichens. Mix of Mature forest stands, mountainous terrain with forests of black spruce, tamarack and jack pine with abundant lichen.</p>
Travel	<p>Connectivity between selected habitat types important given reported patterns of movement among caribou. Some females travel 200 to 500 km from winter areas to calving sites.</p> <p>Females show fidelity to post-calving sites returning to within 6.7 km of a given location in consecutive years.</p>
Avoidance	Avoidance of roads and areas recently burned.

D) Additional Information:

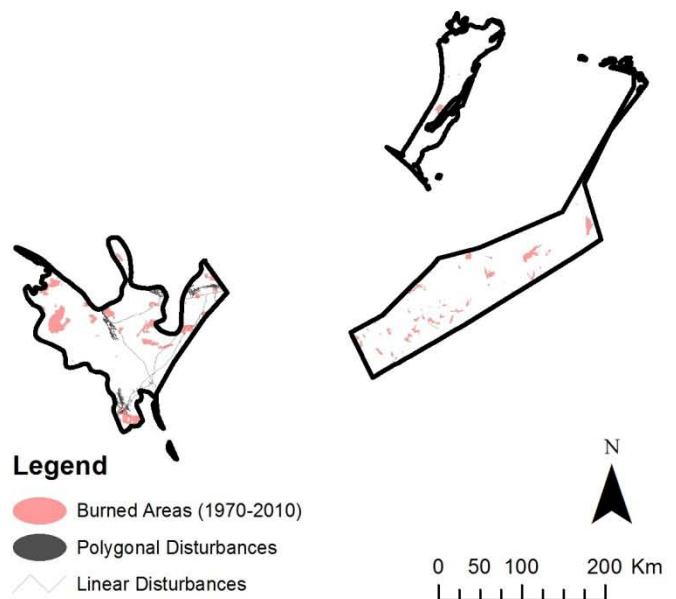


Landcover

- Water
- Shrub
- Rock Outcrop
- Coniferous Forest
- Herbaceous
- Recent Burn
- Deciduous Forest
- Wetland
- Old Burn
- Mixed Forest
- Cropland
- Built-Up

MODIS 2005 Landcover (250m Pixels) (Generated by CCRS)
 Legend reclassified by EC
 With NTDB 1:250,000 Hydrology Layer

Disturbances Across Caribou Range



*Based on fire data provided by jurisdictions

Disturbance Type and Amount:

Burned Areas = 7%
 Buffered⁴ Anthropogenic (no reservoirs) = 2%
 Total Habitat Disturbance = 9%⁵

⁴ Buffered means a 500m buffer is applied to linear and polygonal disturbances.

⁵ Total Habitat Disturbance is non-overlapping which means anthropogenic disturbances and burned areas that overlap are not counted twice in the total.