Characterizing an Inter-jurisdictional Woodland Caribou Range in the Boreal Plain

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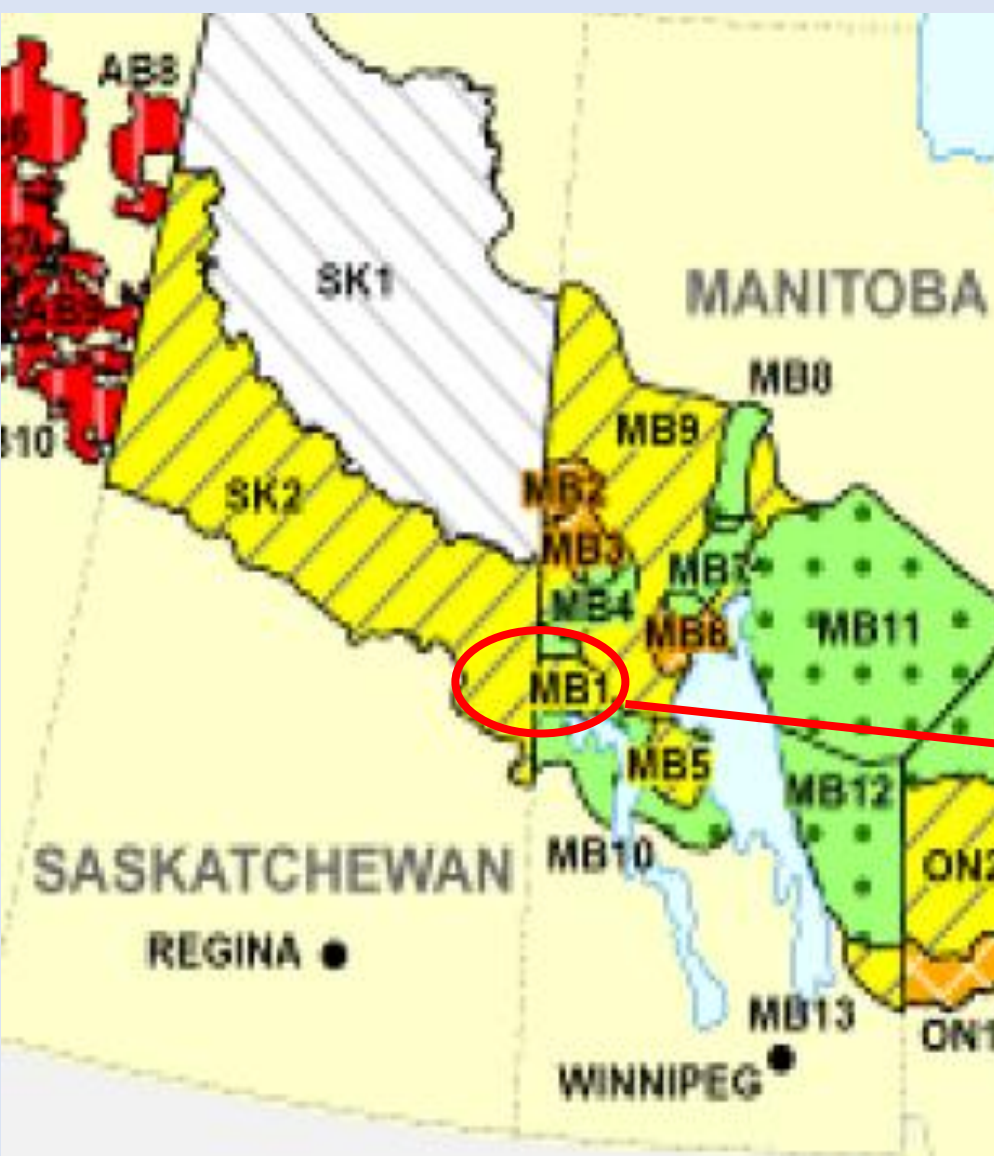
Range Delineation

The Pasquia-Bog boreal caribou range straddles the Saskatchewan-Manitoba provincial boundary. The National Boreal Caribou Recovery Strategy portrays the Pasquia-Bog as two separate caribou ranges: the Boreal Plain Range (SK2) and The Bog (MB1).
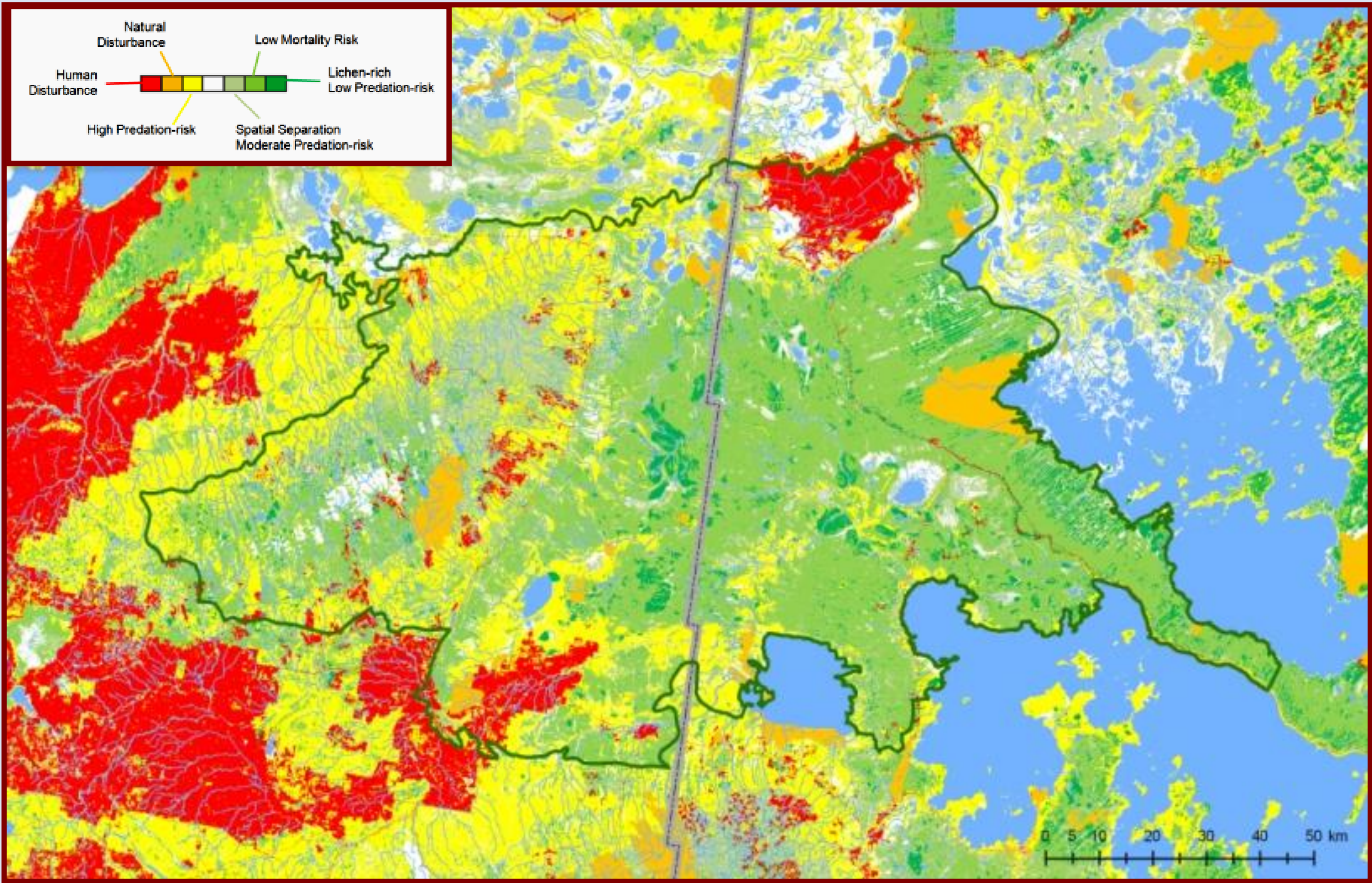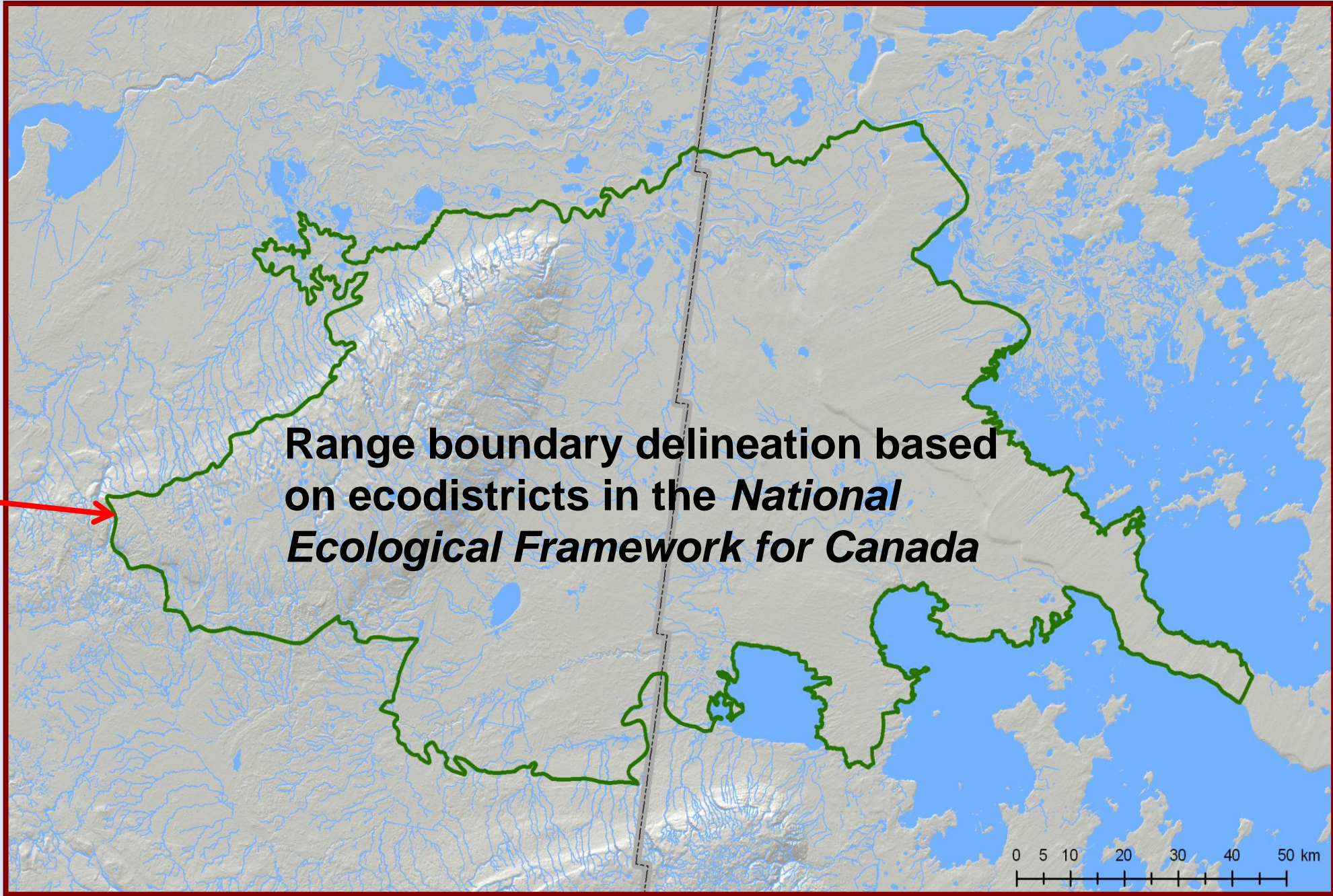
The Canadian Boreal Forest Agreement (CBFA) undertook an assessment of the Pasquia-Bog area to characterize the range using best available science and information.

Adapted from Environment Canada (2012)

Range boundary delineation based on ecodistricts in the *National Ecological Framework for Canada*

Caribou Habitat Preference Model

Two ecosite classifications (Beckingham *et al.* 1996, McLaughlan *et al.* 2010) were assessed for habitat preference based on vegetative characteristics (i.e. conifer dominance, shrub dominance, lichen abundance) and suitability as caribou habitat (i.e. predator detection/risk, forage). Ecosite preference was applied to geospatial habitat data (±30 m resolution; Enhanced Wetland Classification) provided by Ducks Unlimited Canada (Smith *et al.* 2007) to develop a caribou habitat preference model. The habitat preference model had significant concordance with a coarser scale RSF model generated by Environment Canada (2011).

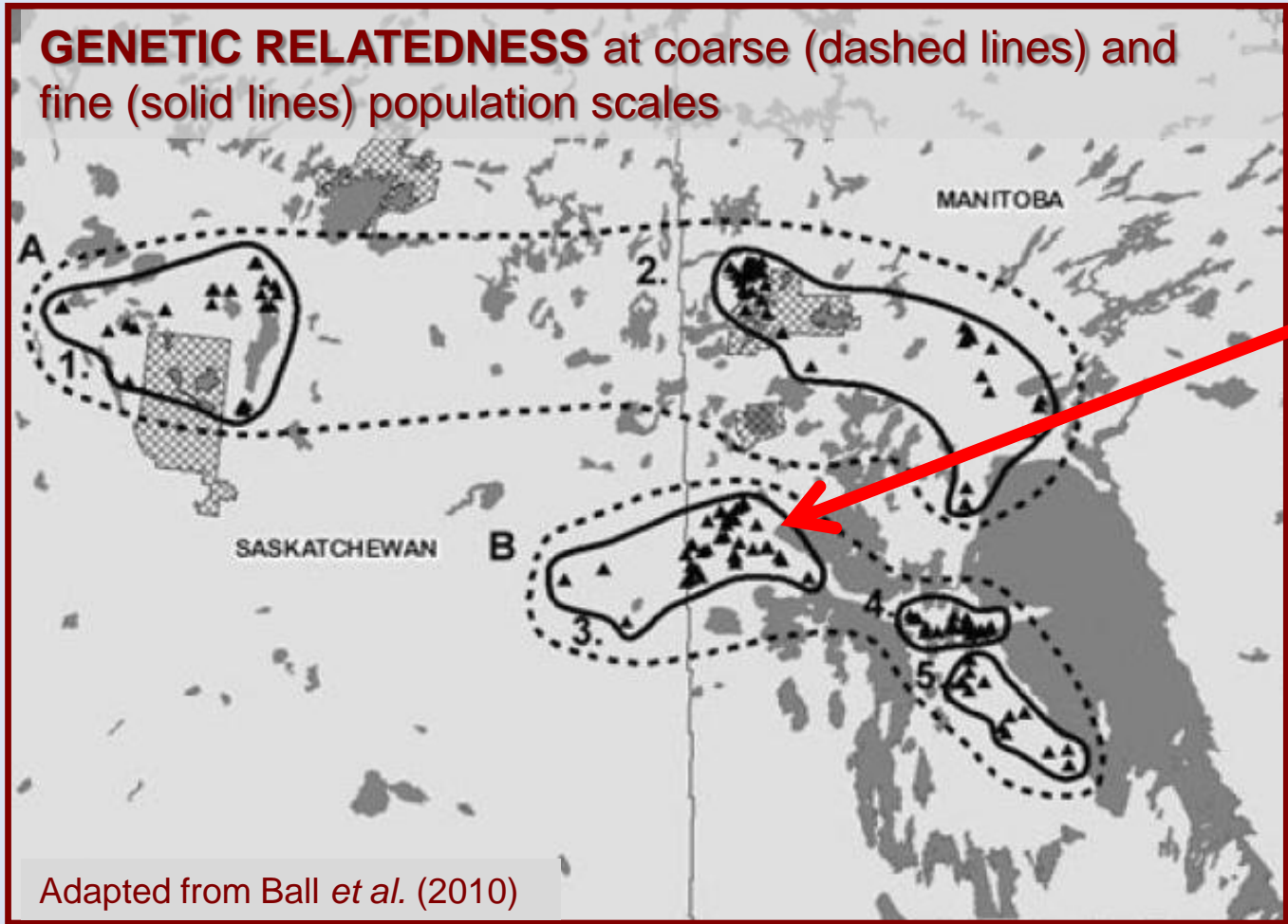| Ducks Unlimited Enhanced Wetland Covertype	Caribou Preference Rating	Caribou Habitat Characteristics
Upland Pine	+3	Lichen-rich mature (>40 yrs old) upland pine for annual forage, predator avoidance, low mortality risk, spatial separation from higher density cervid populations.
Upland Other	0	Matrix
Upland Mixedwood	-1	Low (conifer dominant) to High (deciduous dominant) predation risk
Upland Deciduous	-1	High predation risk
Upland Conifer	+1	Predator avoidance, low predation risk, spatial separation from higher density cervid populations.
Treed Bog	+3	Lichen-rich annual foraging habitat, predator avoidance, low mortality risk, spatial separation from higher density cervid populations.
Shrubby Bog	+2	Seasonal forage (spring, summer, calving), predator avoidance, low predation risk, spatial separation from higher density cervid populations.
Graminoid Bog	+1	Predator avoidance, low predation risk, spatial separation from higher density cervid populations.
Treed Rich Fen	+2	Calving habitat and foraging habitat
Treed Poor Fen	+2	Calving habitat and foraging habitat
Shrubby Rich Fen	+1	Calving habitat and foraging habitat
Shrubby Poor Fen	+1	Calving habitat and foraging habitat
Graminoid Rich Fen	0	Matrix
Graminoid Poor Fen	0	Matrix
Tamarack Swamp	+2	Winter foraging habitat, predator avoidance, low predation risk, spatial separation from higher density cervid populations.
Conifer Swamp	+2	Winter foraging habitat, predator avoidance, low predation risk, spatial separation from higher density cervid populations.
Mixedwood Swamp	0	Low (summer)-moderate (winter) predation risk
Hardwood Birch Swamp	0	Low (summer)-moderate (winter) predation risk
Shrub Swamp	-1	Low (summer)-moderate (winter) predation risk
Meadow Marsh	0	Predator avoidance
Mudflats	0	Moderate-high predation risk
Emergent Marsh	0	Predator avoidance
Aquatic Bed	0	Predator avoidance
Open Water	0	Insect relief, winter travel
Burn	-2	High predation risk (burns <40 yrs old)
Anthropogenic Influenced	-3	High predation risk
Agriculture	-3	No habitat

Caribou Range Occupancy and Genetic Relatedness

Caribou location data for both provinces was overlain on the habitat preference model. A review of the science literature and available provincial data for the Pasquia-Bog range provide additional lines of evidence supporting the conclusion of the Pasquia-Bog as a single inter-jurisdictional range.

Ball *et al.* (2010) indicates the closest genetically related caribou population is the North Interlake Range (MB5).
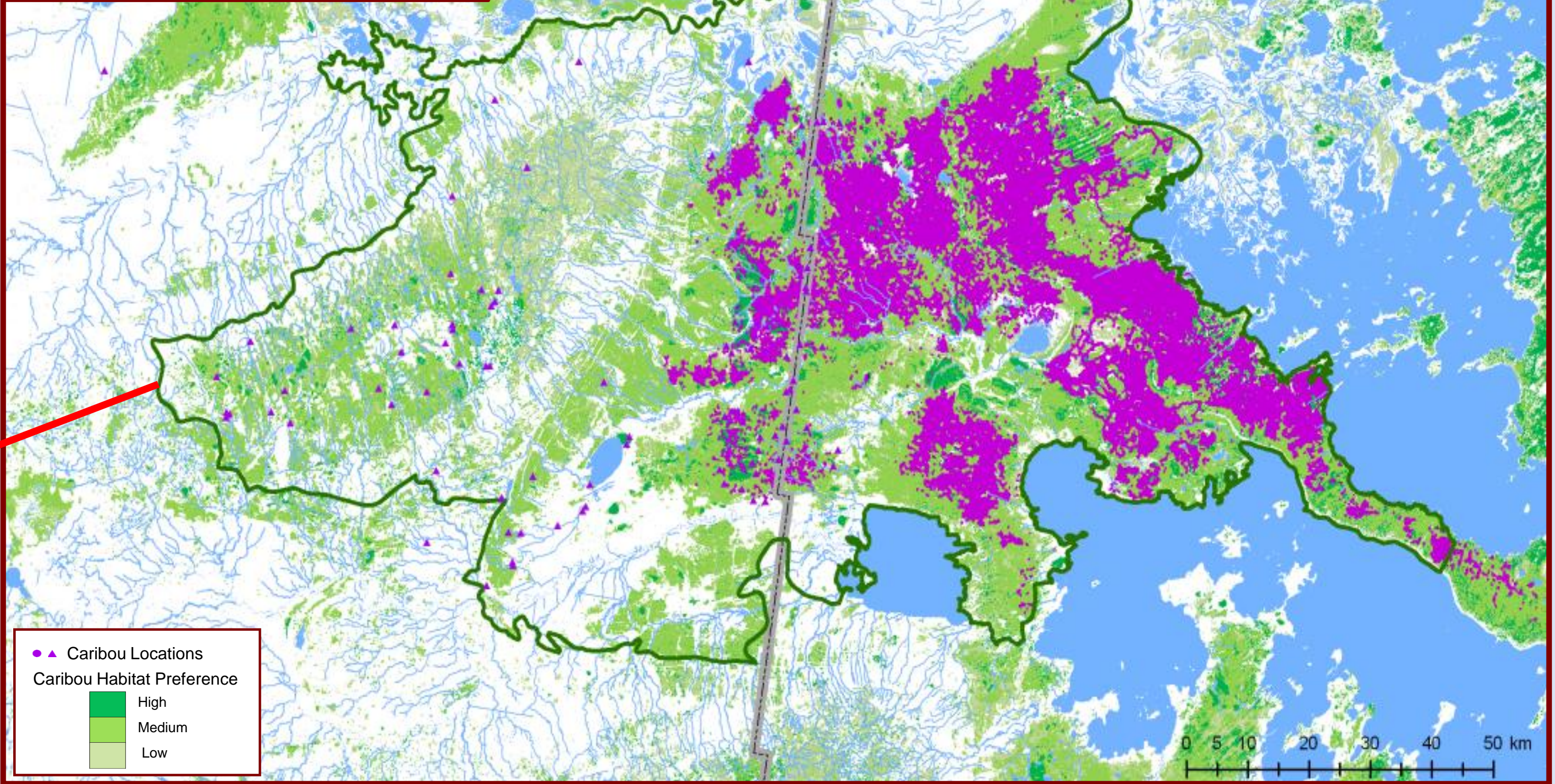
CARIBOU RANGE OCCUPANCY DATA SOURCES:
- 1980-2014 (Aerial Surveys, Local Knowledge, Genetic Sampling, Incidental Sightings)
- 2002-2013 (Telemetry Data)

GENETIC RELATEDNESS at coarse (dashed lines) and fine (solid lines) population scales

Adapted from Ball *et al.* (2010)

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Caribou Locations
Caribou Habitat Preference
High
Medium
Low

Population Estimation and Viability

The estimated population (n= 225-275) of the Pasquia-Bog range is near the minimum viable population threshold (n = 238-300).

In addition to effective caribou habitat management within each range, maintenance of functional landscape connectivity between the Pasquia-Bog and North Interlake caribou ranges is critical to the long-term sustainability of caribou in both ranges.

Source of Estimate	Saskatchewan	Manitoba
Mid-1990s estimates for Saskatchewan (Godwin & Thorpe 2000, Arsenault 2003)	20-40	
Estimate based on 0.02-0.03 caribou/km² (Environment Canada 2012) for 2,211 km² of occupied preferred habitat	44-66	
Estimate based on provincial mean density (0.037/km²) for 2,211 km² of occupied preferred habitat	81	
Best Guess	**50-75**	
Manitoba Conservation estimate based on minimum counts 2010 (n = 121); 2011 (n = 113) Best Guess		**175-200**
Pasquia-Bog Population Estimate (near MVP (238-300) at fine landscape scale)	**225 – 275** (0.030 – 0.037/km²)	
MVP (Arsenault & Manseau 2011)	238 (Closed Pop)	
MVP (Environment Canada 2012)	300 (Closed Pop)	
Hettinga *et al.* 2012 (n = 180 and declining λ=0.90) Ball *et al.* 2010 (North Interlake is genetically connected to Pasquia-Bog at coarse landscape scale)		180
Pasquia-Bog + North Interlake Population Estimate (exceeds MVP (238-300) at coarse landscape scale)	**400 - 450**	

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Ball *et al.* (2010) *Conserv. Genetics* 11:2131-2143.
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