



Range Plan for Woodland Caribou in Saskatchewan - APPENDICES

Boreal Plain Ecozone – SK2 East Caribou Administration Unit

October 2025

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1.0 Introduction to Appendices

These appendices are supporting technical documents for the *Range Plan for Woodland Caribou in Saskatchewan Boreal Plain Ecozone (SK2 East Caribou Administrative Unit)* (the SK2 East range plan). The appendices provide background information, additional technical information and figures and tables. While these appendices provide examples and illustrations of the types of analyses conducted, they do not represent every set of analyses, or every modelling permutation explored during range plan development. There are five appendices:

- Appendix A – Determination of caribou habitat;
- Appendix B - SK2 East disturbance mapping;
- Appendix C - Overview of SK2 East caribou habitat management areas;
- Appendix D - SK2 East scenario analyses; and
- Appendix E - Examples of legislation describing protection and conservation measures.

2.0 APPENDIX A: Determination of Caribou Habitat

2.1 Caribou Habitat Potential Attributes

Caribou habitat potential has been defined based on the attributes of Saskatchewan's forest ecosites (McLaughlan et al., 2010) and their utility and function for caribou. Forest ecosites were evaluated for habitat potential for woodland caribou with the assistance of caribou experts with experience in Saskatchewan ecosystems, during a workshop in March 2013 (Roddy, 2013). Ecosites were evaluated and classified into low, moderate, or high caribou habitat potential based on their potential to provide forage, refuge, or calving habitats regardless of current condition (Figure 1).

2.1.1 Forage

Forage value was rated based on the availability of lichen and other plant species, which are palatable to caribou (Thomas and Armbruster, 1996). The categories of forage value were ranked as follows:

- 1 = low food value for caribou;
- 2 = moderate food value for caribou; and
- 3 = high food value for caribou.

2.1.2 Refuge

Refuge value was rated based on the availability of plant species which provide food value for other ungulates (e.g., moose, deer, elk). This was used as a surrogate for the probability of predation. If these food sources are not present, the ecosite has potential to provide refuge for caribou from predators.

The categories of refuge value were ranked as follows:

- 1 = high food value for other ungulates;
- 2 = moderate food value for other ungulates; and
- 3 = little food value for other ungulates.

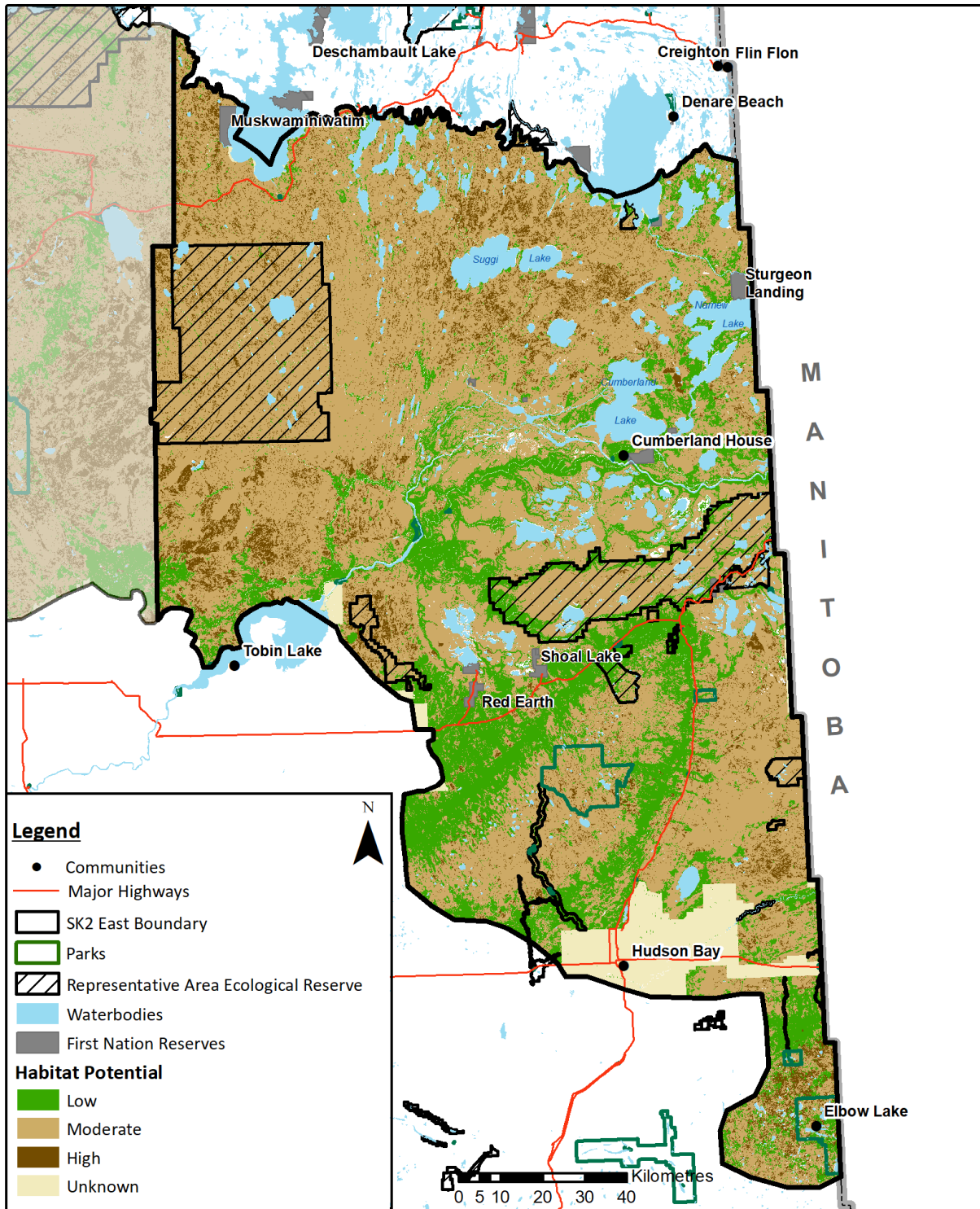


Figure 1. Caribou habitat potential in the SK2 East Caribou Administrative Unit.

2.1.3 Calving and Post-calving

Ratings were made in consideration of both the time of calving and the following two to four-week period. The primary consideration was predator avoidance. The related factors considered were the ability to hide a calf and the lack of spring black bear forage. A secondary consideration was whether there was caribou forage available on the site. The categories of calving and post-calving habitat value were ranked as follows:

- 1** = Low value for caribou calving;
- 2** = Moderate value for caribou calving; and
- 3** = High value for caribou calving.

Overall habitat potential was determined from the sum of the three habitat values of forage, refuge, and calving. Therefore, overall habitat potential values of:

- 3** = low habitat potential for woodland caribou;
- 4, 5 and 6** = moderate habitat potential for woodland caribou; and
- 7, 8, and 9** = high habitat potential for woodland caribou.

The ecosites of the Boreal Plain ecozone and their associated caribou habitat potential ranks are listed in Table 1.

2.2 Biophysical Habitat

Whereas caribou habitat potential considers habitat in its optimal condition, biophysical habitat incorporates stand age and years since disturbance. Forest stands over 50 years old which have a high or moderate habitat potential value meet the biophysical attributes identified in the federal recovery strategy (ECCC, 2020).

Table 1. Caribou habitat potential of Boreal Plain ecozone ecosites (McLaughlan et al., 2010).

Ecosite	Forage	Refuge	Calving	Overall Habitat Suitability	Habitat Potential
BP1 - June grass - mountain goldenrod grassland: Moderately fresh loamy sand	1	N/A	N/A	0	L O W
BP5 - Trembling aspen / prickly rose / grass: Fresh sand	1	1	1	3	
BP6 - Trembling aspen / beaked hazel / sarsaparilla: Fresh loamy sand	1	1	1	3	
BP7 - Trembling aspen - white birch / sarsaparilla: Fresh loamy sand	1	1	1	3	
BP8 - Trembling aspen - white birch / mountain maple: Fresh sandy clay loam	1	1	1	3	
BP9 - White spruce - trembling aspen / feathermoss: Fresh sand	1	1	1	3	
BP10 - Trembling Aspen - white spruce / feathermoss: Fresh silty loam	1	1	1	3	
BP11 - White birch - white spruce - balsam fir: Fresh sandy clay loam	1	1	1	3	
BP13 - White spruce - balsam fir / feathermoss: Fresh sandy clay loam	1	1	1	3	
BP15 - Balsam poplar - white spruce / feathermoss: Very moist silty loam	1	1	1	3	
BP16 - Balsam poplar - trembling aspen / prickly rose: Fresh clay loam	1	1	1	3	
BP17 - Manitoba maple - balsam poplar / ostrich fern: Moist silty clay loam	1	1	1	3	
BP3 - Jack pine / feathermoss: Moderately fresh loamy sand	1	3	1	5	M O D E R A T E
BP4 - Jack pine - trembling aspen / feathermoss: Moderately fresh sand	1	3	1	5	
BP12 - Jack pine - spruce / feathermoss: Fresh loamy sand	1	3	1	5	
BP14 - Black spruce / Labrador tea / feathermoss: Very moist sandy clay loam	1	3	2	6	
BP18 - Black spruce - tamarack treed swamp: Wet humic organic	1	2	2	5	
BP20 - Labrador tea shrubby bog: Wet fibric organic	2	3	1	6	
BP21 - Graminoid bog: Wet fibric organic	1	2	1	4	
BP22 - Open bog: Wet humic organic	1	3	1	5	
BP23 - Tamarack treed fen: Wet fibric organic	2	2	1	5	
BP24 - Leatherleaf shrubby poor fen: Wet fibric organic	1	2	1	4	
BP25 - Willow shrubby rich fen: Wet humic organic	1	2	1	4	
BP26 - Graminoid fen: Wet humic organic	1	2	1	4	
BP27 - Open fen: Wet fibric organic	1	3	1	5	
BP28 - Seaside arrow-grass marsh: Very moist humic organic	1	2	1	4	
BP2 - Jack pine / lichen: Moderately fresh sand	3	3	1	7	HIGH
BP19 - Black spruce treed bog: Moderately wet fibric organic	2	3	3	8	

3.0 APPENDIX B: SK2 East Disturbance Mapping

3.1 Purpose

The Environment Canada (2011) caribou population risk assessment methodology is based on the amount of cumulative human-caused and natural disturbance within a defined caribou range. Appendix B describes disturbance mapping methods and results used to support the SK2 East range plan.

3.2 Methods

The disturbance mapping used to support the national *Recovery Strategy for the Woodland Caribou, (Rangifer tarandus caribou), Boreal Population in Canada - 2012* (Environment Canada, 2012) used satellite imagery and captured visible human-caused disturbances mapped at a scale of approximately 1:50,000. Based on available Government of Saskatchewan data sources, the Saskatchewan Ministry of Environment created an updated human disturbance layer that was equivalent to the 1:50,000 scale of mapping used by Environment Canada for their assessment, current to 2021. Wildfire perimeters were also updated to 2021.

3.2.1 Saskatchewan Data Sources

Human and wildfire disturbance mapping data sources used to create the Saskatchewan Ministry of Environment SK2 East disturbance map are listed in Table 2.

3.2.2 Data Compilation

Three key geographic information system (GIS) data layers were used in the SK2 East disturbance analysis:

- The permanent human-caused disturbance layer includes linear and area-based disturbances that are likely to remain indefinitely on the landscape. Examples of these disturbances include, but are not limited to, highways, major improved bush roads and settlements.
- The non-permanent human-caused disturbance layer includes features that have the potential to be removed from the landscape through reclamation or natural revegetation. Examples of non-permanent disturbances include, but are not limited to, recent forest harvest cut blocks (operating year 1981-82 to 2020-21), bush roads and fire guards.
- The wildfire layer includes all wildfire perimeters for the time period 1982 to 2021. Wildfires are non-permanent natural disturbances. Waterbodies were removed from the wildfire perimeters.

These GIS files were merged and dissolved in ArcGIS 10.8, to create the total disturbance layer for SK2 East. For reporting individual feature type contributions to total disturbance calculations, priority was assigned to different feature classes, and a disturbance hierarchy was developed. Permanent area-based human-caused disturbance is assigned the highest priority, permanent linear features are second, non-permanent linear features third, non-permanent area-based features are fourth and finally wildfires the lowest. A breakdown of the hierarchy and area disturbed is provided in Table 3.

Table 2. Provincial data sources used to map SK2 East disturbances and considerations.

Disturbance Features	Data Source and Considerations
Linear Features¹	
Roads	• The Saskatchewan forestry road network (SFRN) road features were used to map roads within the commercial forest (Government of Saskatchewan, 2012). • Roads were classified into permanent and non-permanent features.² • Permanent roads include primary and secondary highways (SFRN class 0), municipal roads (SFRN class 7-8) and major improved bush roads (SFRN class 1). • Non-permanent roads consist of minor improved bush roads (SFRN class 2), inter-block roads (SFRN class 3), in-block roads (SFRN class 4), public roads (SFRN class 5-6) and unknown roads (SFRN class -1). • The SFRN also identifies and maps a class of linear features called 'trails' (e.g., a linear route suitable for travel by mobile equipment, but not necessarily regular on-road vehicle uses). ○ Trails were typically not mapped as a human-caused disturbance in the ECCC disturbance assessment in SK2 East, so were not included in the SK2 East Saskatchewan disturbance mapping or calculations. ○ The removal of trails in this and other range plan assessments does not necessarily indicate that trails will be removed in disturbance assessments in other caribou range plans. • In areas not covered by the Saskatchewan forestry road network database, and where appropriate, a combination of three other datasets was used: ○ The Saskatchewan Ministry of Environment Technical Resources branch anthropogenic disturbance mapping using FlySask imagery. ○ The Saskatchewan Ministry of Highways & Infrastructure. ○ The Environment and Climate Change Canada 2015 – anthropogenic disturbance footprint within boreal caribou ranges across Canada – As interpreted from 2015 Landsat satellite imagery.
Fireguards	• Linear features from the Saskatchewan forestry road network database were used and then reclassified into fireguards, as well as spatial data from Saskatchewan Public Safety Agency.

Table 2. (completed). Saskatchewan disturbance mapping data sources and considerations for SK2 East.

¹ Permanent: features unlikely to be reclaimed or to naturally revegetate (e.g., highways and communities).
Non-permanent: features could be reclaimed or naturally revegetate (e.g., harvest blocks, in-block roads, etc.).

Disturbance Features	Data Source and Considerations
Linear Features (cont.)	
Electricity Transmission	- Electricity Transmission: Only major transmission lines were included, as most distribution lines follow road corridors. - Linear features from the Saskatchewan forestry road network database were used and then reclassified into transmission lines.
Other Linear Features	- Pipelines have not been digitized and were not included in the analysis. Pipelines in this area typically follow other roads or seismic lines therefore the disturbance footprint is considered captured by other linear features. - Railways are from Saskatchewan Ministry of Highways and Infrastructure.
Area-based Features	
Forest Harvest Blocks	Saskatchewan Ministry of Environment, Forest Service branch harvest block mapping: 40-year forest harvest history, 1981-82 to 2020-21.
Vertical Wells	Saskatchewan Ministry of the Economy integrated resource information system database (updated daily – accessed October 2018).
Settlements	Saskatchewan Ministry of Environment, Technical Resources branch human disturbance mapping.
Other Area-based Disturbances	Saskatchewan Ministry of Environment, Technical Resources branch human disturbance mapping.
Natural Disturbance	
Wildfire Perimeters	- Saskatchewan Ministry of Environment, Wildfire Management branch database 40-year wildfire boundaries, 1982 to 2021. - Waterbodies were removed from the wildfire perimeters and did not contribute to the overall disturbance calculation attributed to wildfire. - CanVec 1:50,000 is the most detailed vector-based dataset depicting waterbodies in northern Saskatchewan. This dataset captures waterbodies <0.01 ha in size.

3.3 Human-Caused Disturbance

3.3.1 Direct Footprint

Human-caused disturbance in SK2 East includes linear features such as roads, powerlines, fireguards and railways, and area-based features including forest harvest blocks, gravel pits, mine sites or settlements (Table 2). The direct footprint refers to the area that is directly affected by human-caused disturbance.

3.3.1.1 Linear Features

Linear features comprise a large proportion of the total human disturbance present in SK2 East. Approximately 7,913 km of linear features are distributed across the Caribou Administrative Unit. Permanent linear features (e.g., primary highways, secondary highways, municipal roads, and major improved bush roads) total 1,255 km, while non-permanent linear features account for the remaining 6,657 km of the total linear disturbance.

3.3.1.2 Area-based Features

The direct footprint of area-based features is 1,643 km² in SK2 East. Permanent area-based features (e.g.

settlements, recreation areas, agriculture areas) constitute only 536 km² of the direct footprint, while non-permanent features (e.g. forest harvest blocks less than 40 years of age) account for the remaining 1,113 km² of the total amount of area-based disturbance.

3.3.2 Direct Footprint and 500 Metre Buffer

As previously described in the data compilation section of this report, a disturbance hierarchy was established to avoid duplication in disturbance calculations for human-caused disturbance categories (Table 3).

A 500 metre buffer was applied to the human-caused disturbance footprint. Environment and Climate Change Canada determined this buffer distance to provide the best link between habitat condition and population status at the national scale (ECCC, 2011).

The total amount of non-overlapping human-caused disturbance (direct footprint plus 500 metre buffer) is approximately 6,680 km² or 26 per cent of SK2 East area. Permanent features (e.g. settlements, highways, and other major roads) are at the top of the disturbance hierarchy but account for only 1,612 km² of total disturbance. Non-permanent human-caused disturbances (e.g. large forest harvest blocks less than 40-years old and non-permanent roads and fireguards) account for the remaining 5,068 km² of disturbance. Non-permanent linear features account for most disturbance in SK2 East (4,111 km²). However, many of these non-permanent roads also overlap non-permanent area-based disturbances. Figure 2 illustrates the location of the permanent and non-permanent disturbance direct footprint, as well as the 500 metre buffer associated with human-caused disturbance.

Table 3. SK2 East non-overlapping human-caused disturbance features and mapping hierarchy.

Disturbance Features and Mapping Hierarchy	Non-Overlapping Area of Direct Footprint + 500 m buffer (km²)	Per cent of SK2 East Area
Permanent Area-based Features	991	4
Permanent Roads	621	2
Non-permanent Linear Features	4,111	16
Non-permanent Area-based Features	957	4
TOTAL	6,680	26

The total area of SK2 East is 25,388 km²

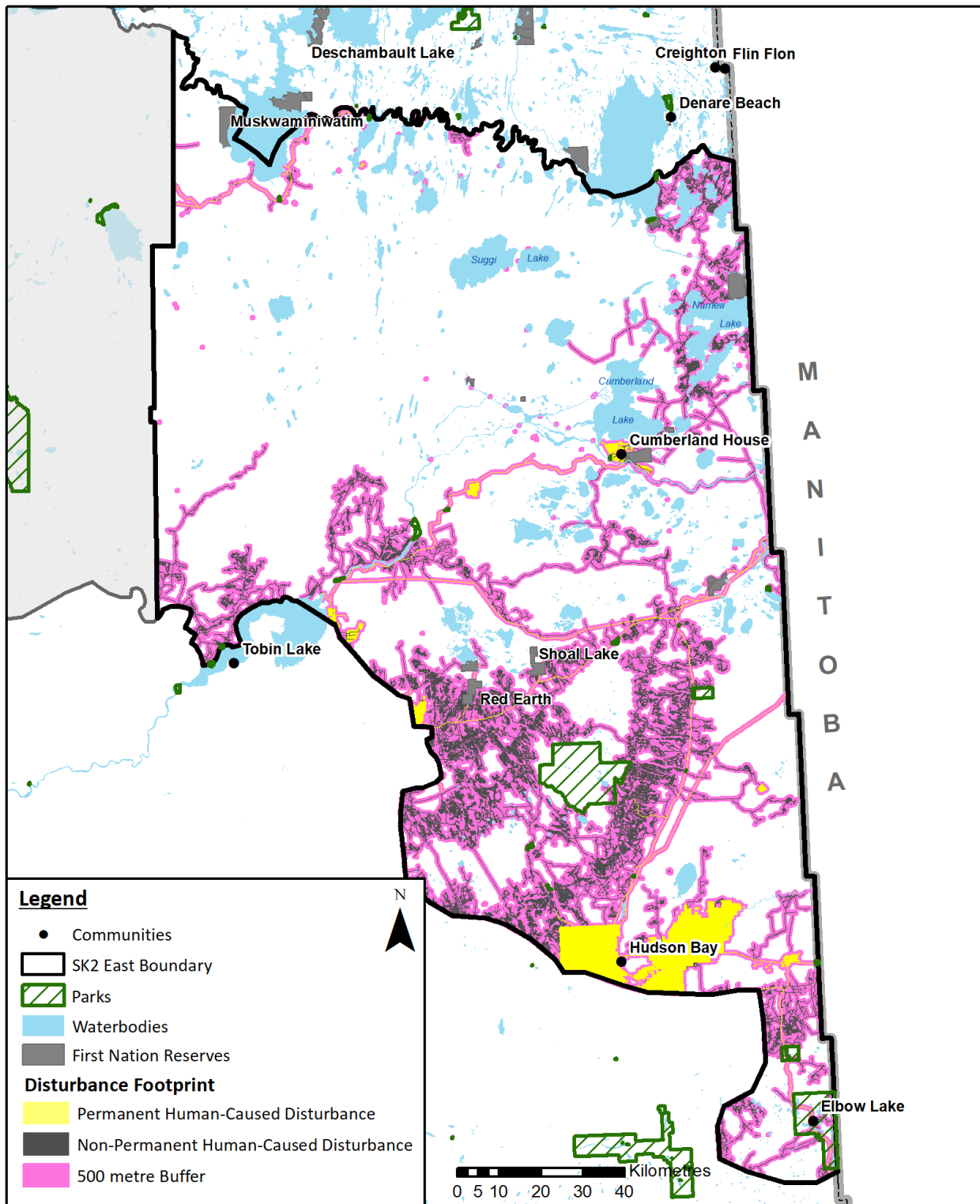


Figure 2. Current human-caused disturbance symbolized by permanent or non-permanent direct footprint along with the 500 metre buffer in the SK2 East Caribou Administrative Unit.

These results represent the best available information at the time of range plan development and may over or under-estimate disturbance due to uncertainties regarding disturbed areas. Other considerations regarding human-caused disturbance are as follows:

- Re-vegetation status of current linear features is not well documented. Given that most are readily visible at a scale of approximately 1:50,000, many features are assumed to be in an un-vegetated state or early-stage of re-vegetation. Many of the linear features represented in the SK2 East human-caused disturbance mapping may be actively used by people.
- The length of time required for a human feature to be considered restored (i.e. no longer has a negative effect on caribou, and/or has reverted to suitable caribou habitat), is not well understood. The Environment Canada (2011) methodology identifies that a period of 40 years is required for wildfire to no longer be considered in a disturbed condition.

3.4 Wildfire

Following Environment Canada (2011) methodology, wildfire disturbance was calculated based on wildfire perimeter mapping with waterbodies removed. Wildfires are considered no longer disturbed when they are older than 39 years. Other considerations regarding natural disturbance are as follows:

- Wildfire severity mapping which identifies unburned remnant patches within wildfire polygons is now available for the Boreal Plain, and in future assessments could be used to identify fine-scale unburned forest patches within wildfires that may be used by caribou. However, at this time, the methodology used in the ECCC disturbance assessment only considers wildfire perimeter boundaries and not more detailed mapping.
- Other natural disturbances (e.g. insect infestation, wind throw) affect the Boreal Plain but have not been considered in the disturbance calculations due to incomplete data.

The total area of wildfire disturbance in SK2 East fluctuates among decades (Table 4). In the last 40 years, the total area burned per decade ranged from one per cent to five per cent of the total SK2 East area.

Table 4. Total area per decade disturbed by wildfire in the SK2 East Caribou Administrative Unit.

Decade	Area Contained within Wildfire Perimeter Boundaries (km ²)	Area Contained within Wildfire Perimeter Boundaries (Per cent of SK2 East)
1982 to 1991	203	1
1992 to 2001	194	1
2002 to 2011	446	2
2012 to 2021	1,210	5

The total area of SK2 East is 25,388 km²

To assess the contribution of wildfires to overall habitat disturbance, overlap among wildfire perimeters from 1982 to 2021 was removed, followed by the removal of overlapping human-cause disturbance and 500 metre buffers. The final amount of wildfire disturbance in the SK2 East area is 1,113 km², or four per cent of the SK2 East (Table 6 in main range plan document).

3.5 Total Disturbance

The total extent of non-overlapping human-caused (i.e. direct footprint plus 500 metre buffer) and wildfire disturbance is 7,793 km² or 31 per cent of SK2 East. Human-caused disturbance accounts for 6,680 km² (i.e. 26 per cent) of the total non-overlapping disturbance, with wildfire accounting for the remaining 1,113 km² (i.e. 4 per cent).

4.0 APPENDIX C: Overview of SK2 East Caribou Habitat Management Areas

4.1 Introduction

This appendix describes the rationale and management considerations associated with the caribou habitat management areas (CHMAs) on provincial Crown lands in the SK2 East Caribou Administrative Unit. Map overlays demonstrate how habitat potential, human-caused disturbance and recent wildfire disturbance were used to identify and delineate the CHMAs. Table 5 describes each CHMA and potential management considerations, and Table 6 summarizes the area, habitat potential and disturbance characteristics of the CHMA tiers and other land use designations in SK2 East.

4.2 Overview of the Caribou Habitat Management Areas

Section 5.1 of the range plan describes the caribou habitat management area framework for the SK2 East. Provincial Crown lands in SK2 East have been divided into three categories of caribou habitat management areas – Tier 1, Tier 2, and Tier 3 (Figure 2). Tier categories are based on their relative importance to caribou, habitat conditions and potential risks. Different management objectives and strategies were developed for each tier. Tier 1 represents areas of high importance, where caribou habitat retention is the primary objective. Tier 2 areas are of importance to caribou but have higher levels of habitat disturbance with the objective of caribou habitat restoration. Tier 3 areas are important for maintaining overall landscape connectivity among Tier 1 and Tier 2 CHMAs.

The following factors were considered to determine tier classifications and boundaries:

- Recent and historical caribou occupancy/utilization;
- Habitat potential based on ecosite-habitat relationships and Indigenous Traditional knowledge;
- Amount of human-caused disturbance;
- Amount of recent wildfire disturbance;
- Habitat connectivity; and
- Risks of northwards range retraction.

Current and long-term use by caribou was the first criteria for selection of Tier 1 habitat areas. Caribou occupancy information in some parts of SK2 East is limited, so this was supplemented by habitat potential to include undisturbed areas comprised of high and moderate potential habitat. Most Tier 1 areas have low disturbance, except for CHMA 3 in the Pasquia Hills, which still has documented caribou use despite a higher level of both human-caused and wildfire disturbance. CHMA 2 is unique because it is bordering with 'The Bog' in Manitoba and the caribou on both sides of the SK/MB border are closely related (Priadka et al., 2018).

Tier 2 areas are typically identified as areas with a combination of high and moderate habitat potential but with moderate to high levels of disturbance (both natural and human-caused). In some cases, information of past caribou occupancy was also available and was used to help delineate boundaries.

Map overlays of the CHMAs and habitat potential, human-caused disturbance, recent wildfire (1982 to 2021), and Aboriginal Traditional knowledge represented by a resource selection function map of

woodland caribou habitat (Mamun and Brook, 2017) are shown in Figures 3-7, respectively. Table 5 lists the CHMAs and describes the rationale and potential management concerns within each CHMA. Table 6 provides information on the size, amount of disturbance (human-caused and wildfire), and the amount of low, moderate, and high habitat potential within each of the CHMAs.

On average, Tier 1 CHMAs have the greatest proportion of high value habitat potential when compared to Tier 2 and Tier 3 areas (Table 6). Conversely, Tier 3 areas have the greatest proportion of low value habitat potential compared to Tier 1 and Tier 2 areas. However, Tier 3 areas are still comprised of approximately 16 per cent high value habitat potential, which could be important for habitat connectivity.

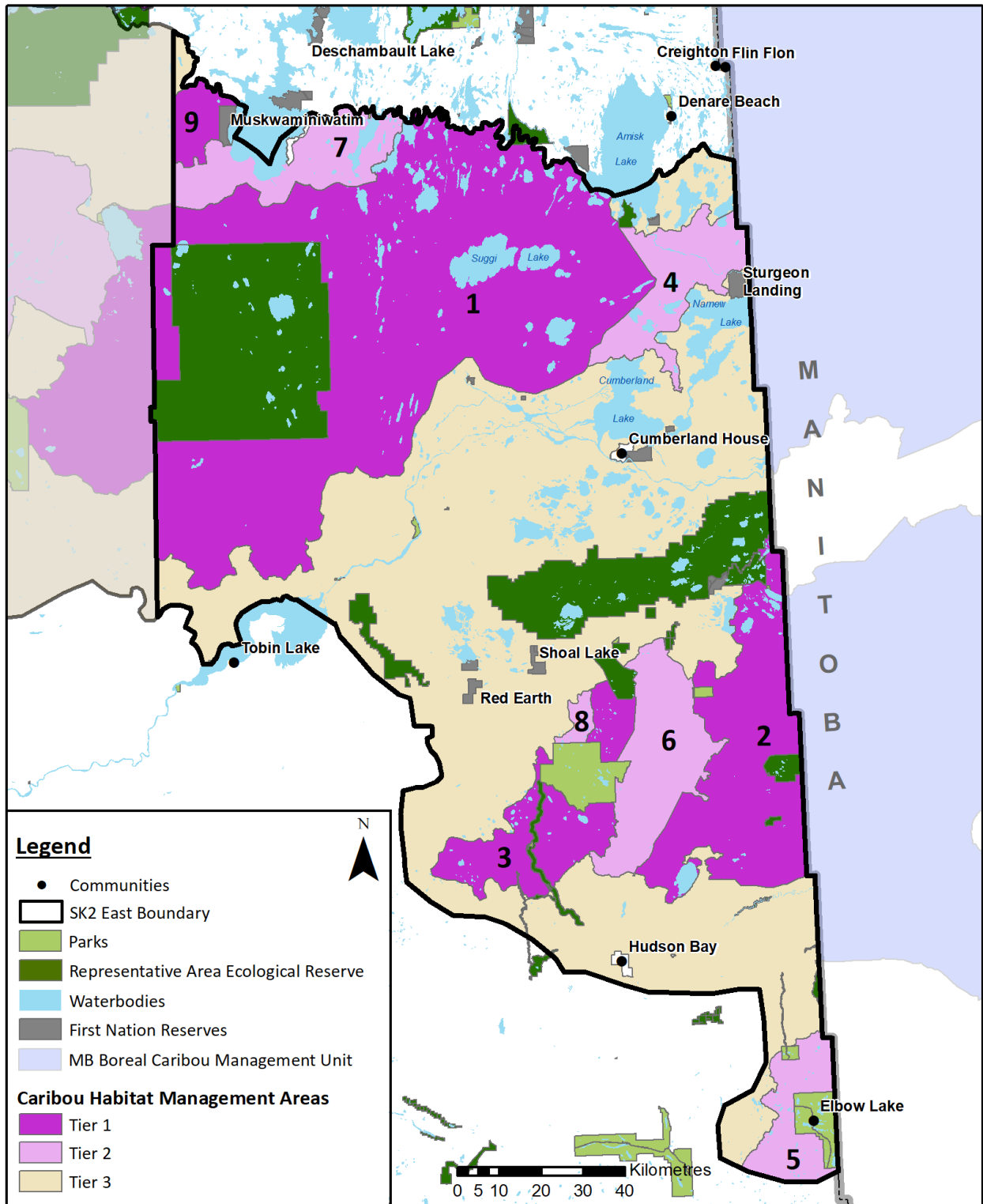


Figure 3. Caribou habitat management areas of the SK2 East Caribou Administrative Unit.

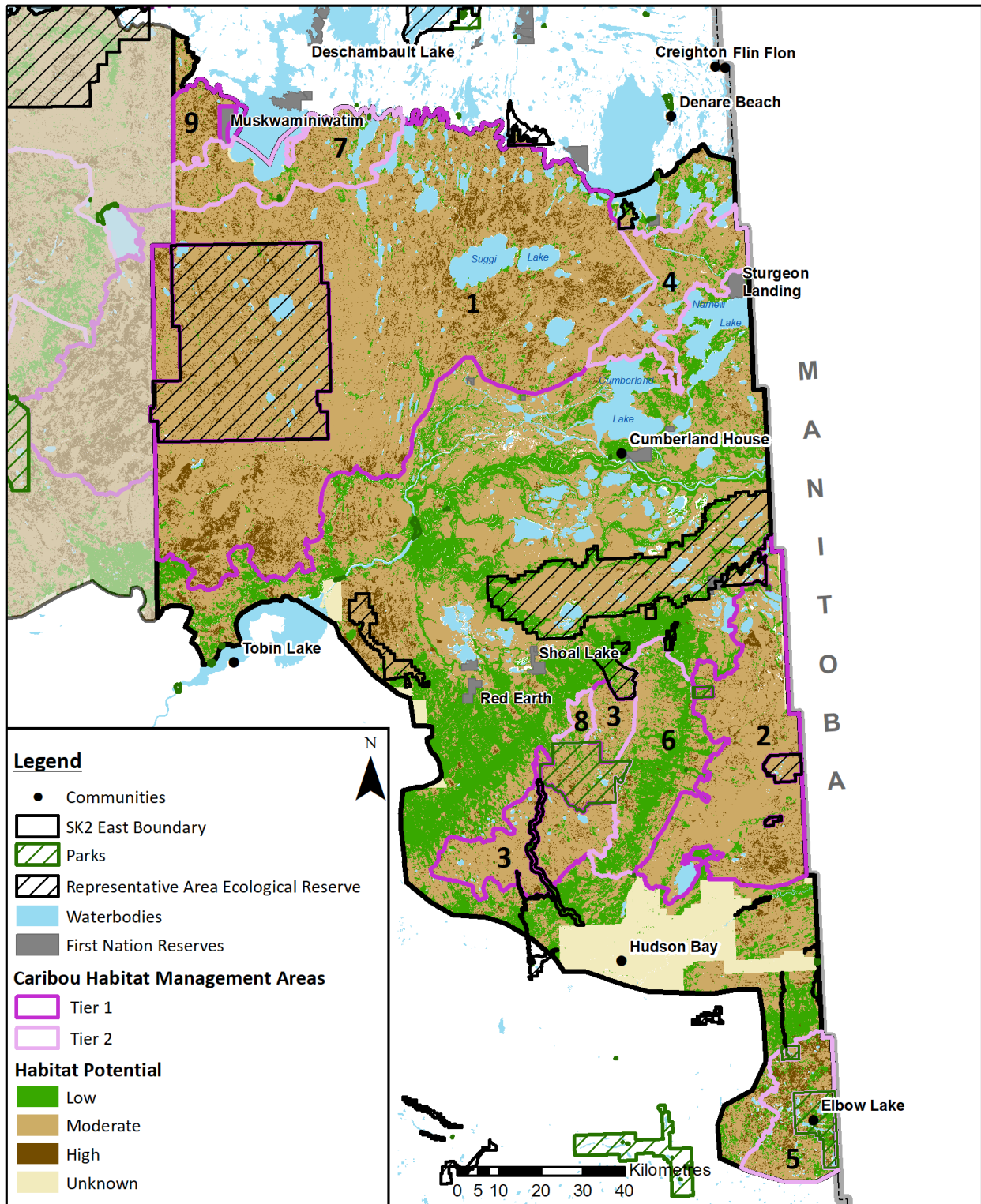


Figure 4. Caribou habitat potential and caribou habitat management areas of the SK2 East Caribou Administrative Unit.

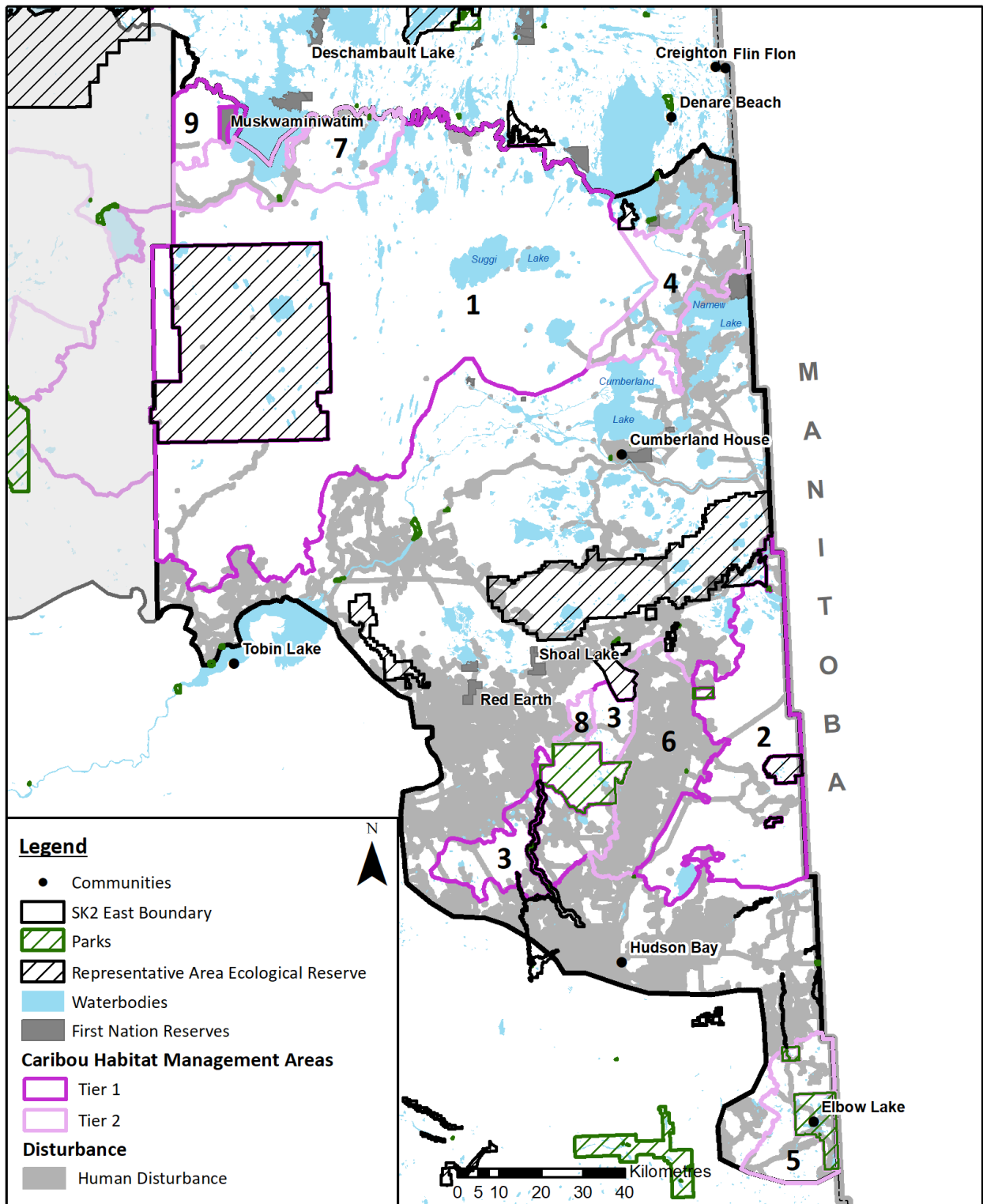


Figure 5. Total human-caused disturbance and caribou habitat management areas of the SK2 East Caribou Administrative Unit.

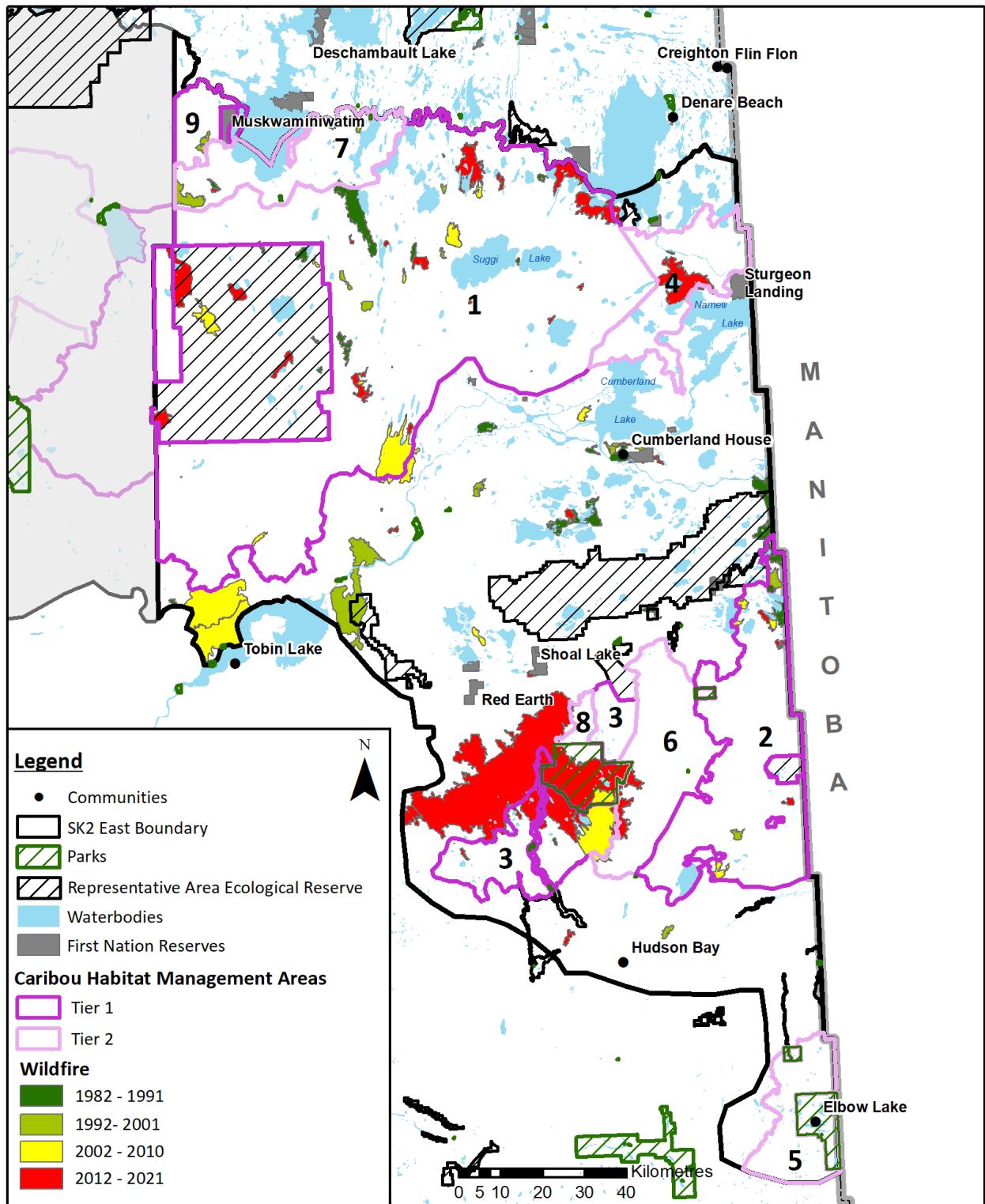


Figure 6. Wildfire disturbance and caribou habitat management areas of the SK2 East Caribou Administrative Unit.

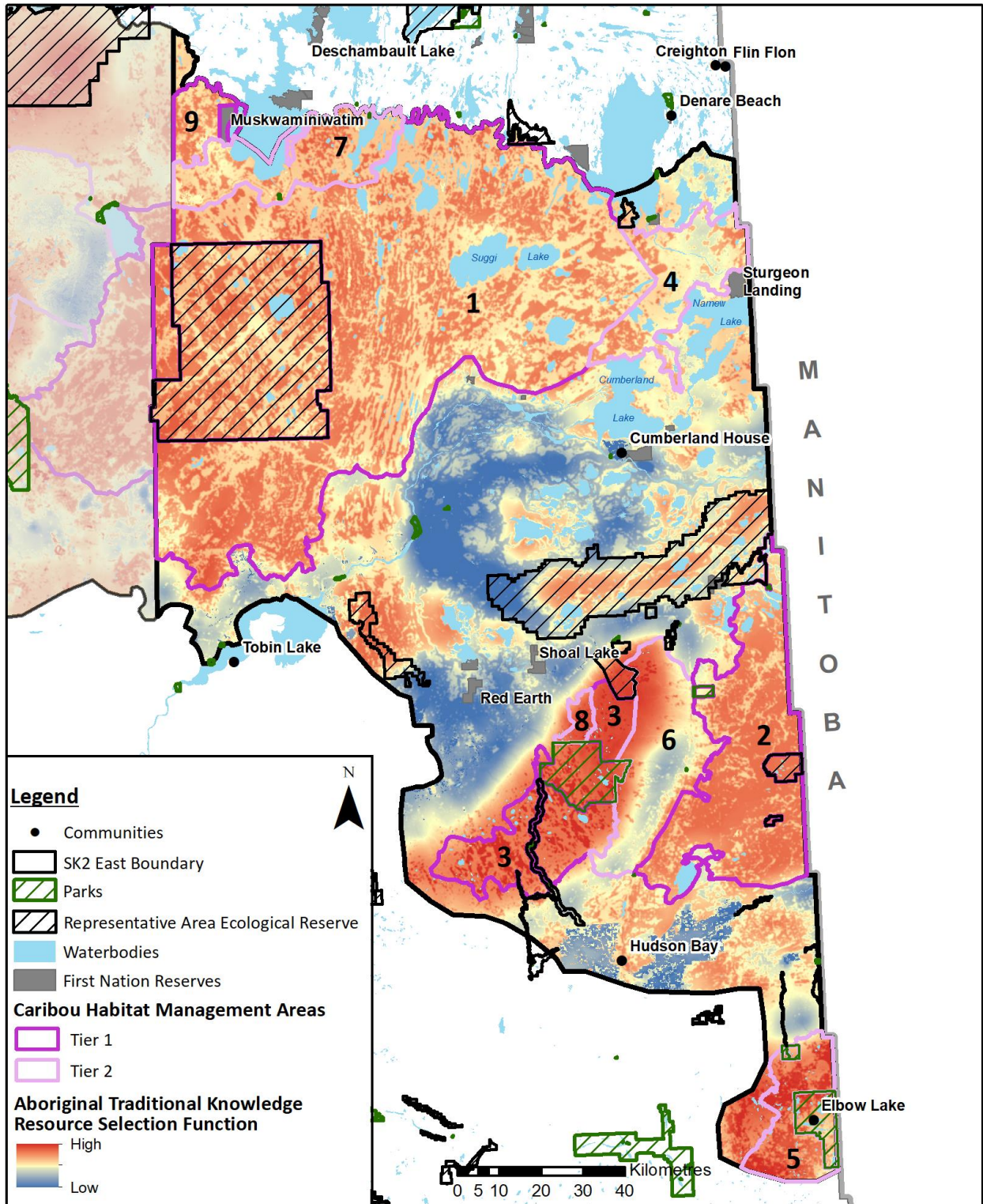


Figure 7. Aboriginal Traditional knowledge resource selection function map of woodland caribou habitat (Mamun and Brook, 2017) and caribou habitat management areas of the SK2 East Caribou Administrative Unit.

Table 5. Descriptive summary of each SK2 East caribou habitat management area (CHMA) and potential management concerns.

CHMA	Tier	Area Description	Potential Management Concerns
1	Tier 1	CHMA 1 is part of the Suggi-Deschambault Lakes complex, which is well-known for its woodland caribou. The topography varies from large sandy areas and limestone-like dolomite outcrops in the north and west to abundant water-rich lowlands. Numerous sandy jack pine lichen ridges offer ideal winter forage for caribou. It is bounded by the Saskatchewan River Delta on the south, and Big Sandy Lake and Narrow Hills on the west.	Mineral exploration currently occurs along the northern edge, which could result in loss of valuable foraging habitat in the long-term. There is also interest in forestry along the northern portion, with past forest harvest having occurred along the southern and eastern edge.
2	Tier 1	The Pasquia Bog is a large water-rich lowland to the east of the Pasquia escarpment. It is well known for caribou and extends into Manitoba. Black spruce muskeg and open bogs dominate the landscape. It is bounded to the north by the Saskatchewan River Delta and to the south by an intrusion of agriculture from boreal forest conversion.	Forestry occurs where conditions permit. There is considerable interest in the exploration and development of peat harvesting operations, with one operation currently underway.
3	Tier 1	The Pasquia Hills area is a perched peatland dominated by black spruce interspersed with narrow ridges of jack pine/black spruce. Many small source lakes are ringed with tamarack. Water spills out of this basin through a few rivers and moderate slopes to the north and west. The slopes are dominated by hardwoods. Caribou have a long-reported history of occupancy that continues to the present. Moderate value habitat dominates and is interspersed with high value habitat.	Forest harvesting along the slopes and escarpment that bound this area could isolate caribou from range to the south and southeast. There are several roads and trails throughout that could further fragment critical habitat. Additionally, a large wildfire occurred in 2021 through Wildcat Hills Park and the western slope of the Pasquia Hills.
4	Tier 2	The Sturgeon Weir-Namew area has some recently documented caribou occupancy around and within a chain of source lakes in its southern reaches. The northern half is transected by the Sturgeon-Weir River. Cumberland and Namew Lakes form the southern boundary, Manitoba the eastern, and Tier 1 habitat to the west.	Forestry has been prevalent in the northern half for decades although access has mostly been limited to winter trails. The area is remote with some recreational activity and cottage development where the area contacts Amisk, Maraiche, Saskoba, and Namew Lakes.

Table 5. (continued) Descriptive summary of each SK2 East caribou habitat management area (CHMA) and potential management concerns.

CHMA	Tier	Area Description	Potential Management Concerns
5	Tier 2	The Armit Lake basin is part of a partially dissected peatland in the upper center of the Porcupine Hills. Large stands of black spruce muskeg connect to the Pasquia Bog by strings of mixed black spruce and jack pine. These tracts of forest descend the gradual north slopes of the hills to the lower reaches of meandering creeks, and on to rivers such as the Red Deer and Armit that traverse the Pasquia Bog and feed Red Deer Lake on the Manitoba side. There is a historical record of caribou but no recent sightings.	Agricultural intrusion has been extensive around all sides of the area. Forestry and recreational activity are the main forms of human disturbance that need to be considered.
6	Tier 2	The Pasquia Escarpment ranges from rugged, deeply cleft ravines along the eastern side, to long moderately steep slopes to the south. It is considered to be an important connection for caribou between the Pasquia Hills and Pasquia Bog caribou population. There are sufficiently expansive stands of black spruce/jack pine mixed forest on the slopes within this area to foster caribou habitation and movement throughout.	It is heavily disturbed by forestry roads, trails, and logging activity. Hunting and related recreation are also common in this area. Agriculture to the south, a major highway and rail line bordering its eastern side interrupt migration paths for caribou coming and going from the Pasquia Hills.
7	Tier 2	The landscape is level, consisting mostly of patches of black spruce and tamarack treed fens. Bounded to the north by Deschambault Lake and to the east by Bigstone Lake.	A major highway runs the length of CHMA 7, which provides access for forest harvest, other industrial developments, and recreational activities.
8	Tier 2	The northwestern part of the Pasquia Hills is predominantly black spruce, interspersed with stands of trembling aspen. It provides connection between Wildcat Hills Park and Rice River Canyon. This area has higher levels of human-caused disturbance and more hardwood forest than the adjacent CHMA 3.	Conversion of softwood to hardwood stands after logging could also change the balance among different species to the detriment of caribou.
9	Tier 1	The area to the west of Deschambault Lake is primarily black spruce bog and tamarack, with scattered black spruce – tamarack treed swamps. There is long term and current use by woodland caribou.	Limited disturbance currently, but there is some interest in developing access and potential resource extraction in the area.

Table 5. (completed) Descriptive summary of each SK2 East caribou habitat management area (CHMA) and potential management concerns.

CHMA	Tier	Area Description	Potential Management Concerns
N/A	Tier 3	Tier 3 accounts for almost 50 per cent of the SK2 East area. This large area contains a mix of higher- and lower-value habitats within a broad matrix of moderate - value habitat. Maintaining connectivity between the different parts of the range is the most important consideration for Tier 3. Some areas may also contain previously undocumented areas of caribou occupancy. Tier 3 has the highest levels of human-caused disturbance and most near-term future land uses, which are anticipated to continue to be focused in these areas.	Forest harvesting, road networks and multiple land uses into Tier 3 habitat support an increased level of other ungulates and wolves. High densities of linear features have further reduced its value as connective habitat for caribou and potentially increases mortality risk. Areas with undocumented caribou occupancy may also be compromised. Risk of range retraction is also a concern along the southern boundary of the SK2 East. <u>Potential Land Use Concerns:</u> • Historical, current, and future forest harvesting and road development. • Mineral exploration and development. • General transportation, access, and utilities. • Recreational access. • Peat harvesting.

Table 6. The area and disturbance levels associated with habitat potential classes within the caribou habitat management areas of the SK2 East Caribou Administrative Unit.

CHMA	Area (km²)	% of SK2 East	% Habitat Potential Class			% Disturbed		
			Low	Moderate	High	Human-caused	Wildfire	Total
TIER 1								
1	6,102	24	3	81	15	2	5	7
2	1,618	6	7	84	9	12	3	15
3	778	3	7	87	6	34	13	47
9	212	1	2	74	24	3	3	7
Summary Tier 1	8,711	34	4	82	14	7	5	12
TIER 2								
4	642	3	10	80	9	29	6	35
5	418	2	20	55	25	24	0	24
6	820	3	48	48	4	88	<1	88
7	724	3	9	81	10	16	2	18
8	65	<1	25	72	3	39	3	42
Summary Tier 2	2,669	11	24	66	10	43	2	45
TIER 3								
Summary Tier 3	10,264	40.5	43	54	4	43	3	45

5.0 APPENDIX D: SK2 East Scenario Analyses

5.1 Purpose

This appendix describes methods and results for scenario analyses used to support development of the SK2 East range plan. These analyses assisted in creating and testing land management and disturbance reduction concepts that may contribute to reduced landscape disturbance and improved woodland caribou habitat conditions in the SK2 East Caribou Administrative Unit.

5.2 Approach

Scenario analysis allows for the exploration of potential future conditions based on different assumptions. Different factors affecting future conditions can be systematically varied to better understand the relative influence or magnitude of change on potential outcomes. The scenario analysis approach used to support the SK2 East range plan examined major human factors that create or influence the amount and pattern of landscape disturbance over a 50-year time horizon. Beyond 50 years, uncertainty in the main assumptions relating to forest harvest utilization, other industrial developments and wildfire was too high to provide confidence in modelled habitat disturbance results.

Wildfire suppression effectiveness was not included in the management strategies evaluated. The potential impacts of climate change on wildfire were not directly assessed in the analyses, but climate change may result in an increased amount of wildfire disturbance in the Boreal Plain. However, the magnitude of that increase and how wildfire suppression activities or other wildfire risk mitigation activities in the commercial forest may respond are uncertain.

5.2.1 Land Use Assumptions

Major assumptions for each land use sector considered in the SK2 East scenario analyses are described in Table 7. Mineral resource potential and the locations of major subsurface mineral and petroleum dispositions and surface dispositions for peat harvest shown in Figure 8. The location of future forest harvesting will occur on the productive forest land base (shown in green in Figure 9), with specific locations determined through detailed forest estate modelling. The locations of future mineral developments are expected to occur in the high mineral resource assessment category areas in the northern portion of SK2 East (Figure 8).

Table 7. Overview of the land use assumptions guiding the SK2 East scenario analysis by sector.

Land Use Sector	Land Use Scenario Assumptions
Forestry	Forestry is expected to remain as the dominant land use activity in SK2 East for the coming decades. The potential effect of different levels of forest harvest utilization on habitat disturbance was a key factor explored in the future scenarios. Modelling future forest harvest requires consideration of three main factors: • Forest harvest utilization; • Forest harvest patterns; and • Location of forest harvest Forest Harvest Utilization Based on existing mill capacity and historic forest product market conditions, the forest industry in SK2 East is forecast to maintain or increase current levels of utilization. Forest harvest utilization was the key variable examined in the SK2 East scenario analysis. Forest Harvest Patterns Updated data supported modelling of harvest event planning in the North East TSA. For this range plan, harvest event planning was not able to be modelled in the Pasquia Porcupine TSA but will be explored at the next FMP review. Implementation of harvest event planning is expected to result in reduced disturbance levels. Guiding Principles have been integrated into the Forest Operating Plan Standard (Government of Saskatchewan, 2022) and will be implemented for all future commercial forest harvesting. Location of Forest Harvest For the selected scenarios, most future forest harvesting is expected to continue to occur in low and moderate potential caribou habitat. In the 50-year scenario, most forest harvesting is expected to continue to occur in Tier 3. Harvesting in Tier 2 areas was limited to the first 20 years of the modelled scenarios, while harvest was excluded from the Tier 1 areas over the entire 50-year scenario period.
Mineral Exploration and Development	Some parts of SK2 East have high mineral potential. Saskatchewan’s critical minerals strategy (Government of Saskatchewan, 2023) is likely to increase new mineral exploration and development in the region. In the scenarios, mineral interest was assumed to continue to be focused on the northern part of SK2 East, with ongoing peat interests in the south. Mineral Exploration Mineral exploration is required to find and confirm economic mineral resources. These activities are not modelled in the SK2 East scenarios due to insufficient data but are recognized as an ongoing activity and source of non-permanent habitat disturbance in parts of the region.

Table 7. (continued) Overview of the land-use assumptions guiding the SK2 East scenario analysis by sector.

Land Use Sector	Land Use Scenario Assumptions
	Mineral and Peat Development In the scenarios, most mineral exploration and development interest was assumed to continue to be located in the northern part of SK2 East, with ongoing peat interests in the south. Sand and gravel extraction is an important economic activity and is expected to continue at current rates. Most extraction sites are near existing roads and developments—specific new locations were therefore not considered.
Linear Features	SK2 East has a well-developed network of all-season roads, including several paved highways and a rail line. Except for new access roads required for forestry, mineral exploration, and similar activities, a major expansion of the public road network is not anticipated. The amount and location of new access roads will be dependent on the location, intensity and operating practices related to forest harvesting and mineral exploration and development. Permanent Linear Features All permanent linear features such as numbered highways, major improved bush roads, municipal roads, transmission lines and rail lines were maintained. No new features were modelled for the 50-year scenario period. Non-Permanent Linear Features Non-permanent linear features include access roads and mineral exploration trails, inter-block forestry roads and in-block forestry roads. The reclamation of non-permanent linear features is a key strategy to manage caribou habitat and is an important factor influencing the amount of future human-caused disturbance. Non-permanent roads were assumed to be reclaimed as follows: • As per the <i>Forest Operations Standard</i> (Government of Saskatchewan, 2020), all new in-block roads are to be reforested within two years of harvesting and are projected to recover at the same rate as the surrounding harvest block. • New non-permanent forestry roads are to be reclaimed and restored following harvest completion. A limited number of new forestry-related roads were added to the landscape based on information obtained by the Ministry of Environment from the forest licensee tactical plan for the Pasquia Porcupine TSA.
Settlements	SK2 East includes several existing communities, villages, and recreational cottage subdivisions. While community growth is expected for existing settlements, the establishment of new communities or new major recreational subdivisions is not anticipated.

Table 7. (completed) Overview of the land-use assumptions guiding the SK2 East scenario analysis by sector.

Land Use Sector	Overview of Assumptions
Recreation	Multi-season motorized and non-motorized recreation is an important activity in SK2 East. These activities are anticipated to remain at current levels or potentially increase. The extensive road and trail network in SK2 East receives high levels of summer and winter use. Effects of changing intensity of recreational activity was not considered in this analysis.
Wildfire	Wildfire was not modelled spatially. Instead, the amount of wildfire disturbance outside of human-caused disturbances over the last 20 years was calculated and then added on a per decade basis to future projections. New wildfire disturbance was added at a constant average burn rate of 26 km²/year or 0.2 per cent of SK2 East per year. The majority of SK2 East falls within the primary and secondary timber areas and will continue to be in the high value commercial forest full response wildfire management zone. A similar level of wildfire suppression effectiveness was assumed for the 50-year scenario.
Other Land Uses	The location and intensity of all other land uses are projected to occur in similar locations and amounts as the current situation for the duration of the 50-year scenario period. These land uses were not simulated. While development of small linear and area-based disturbances contributes little to the overall disturbance levels in an area the size of SK2 East, there may be localized effects on caribou habitat and connectivity that are not reflected in these scenarios.
Reclamation Time	A 40-year recovery period was assumed for all human and wildfire disturbances to be considered undisturbed caribou habitat.

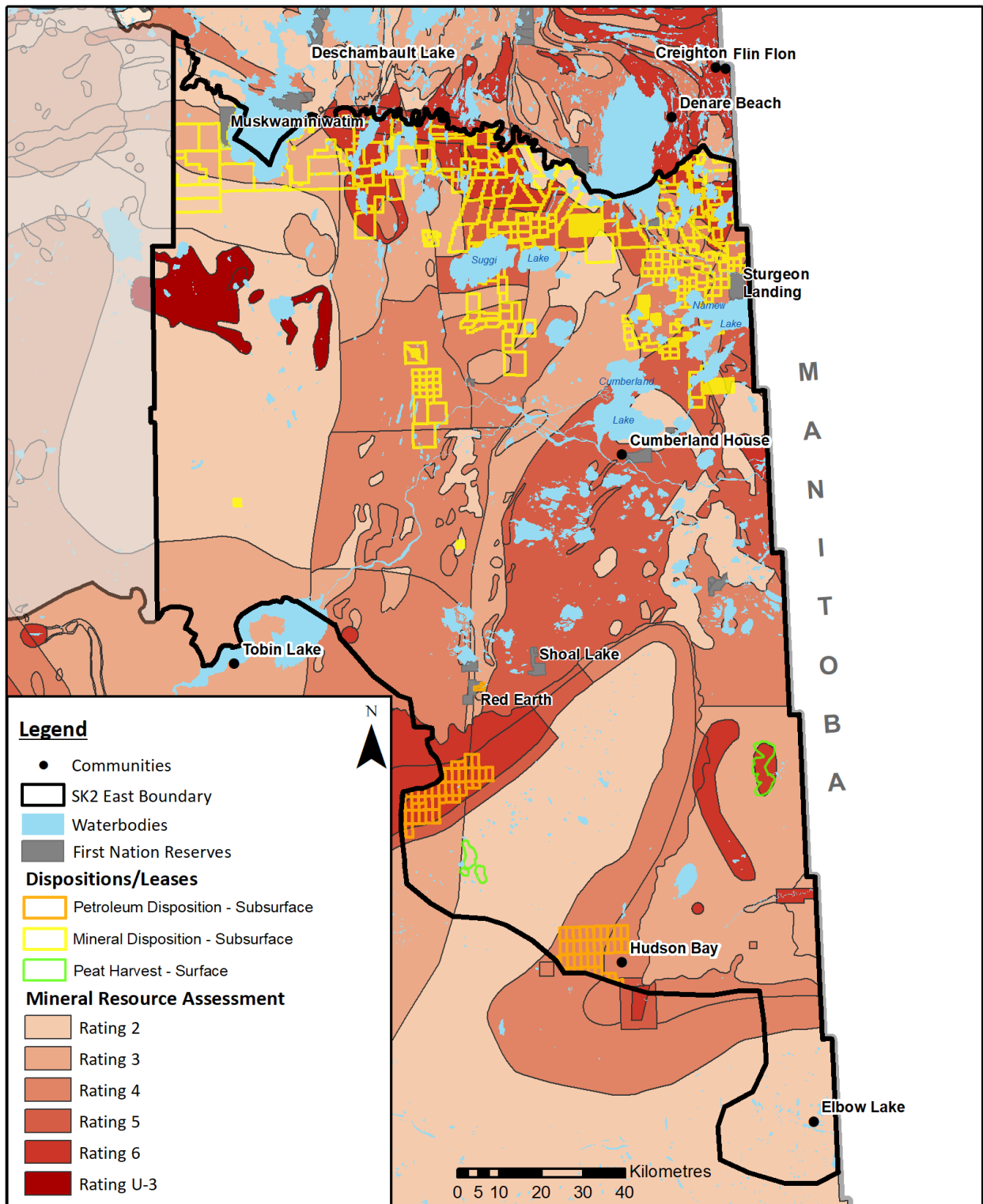


Figure 8. The SK2 East Caribou Administrative Unit mineral resource assessment and mineral, peat, and petroleum dispositions and leases (current 2019).

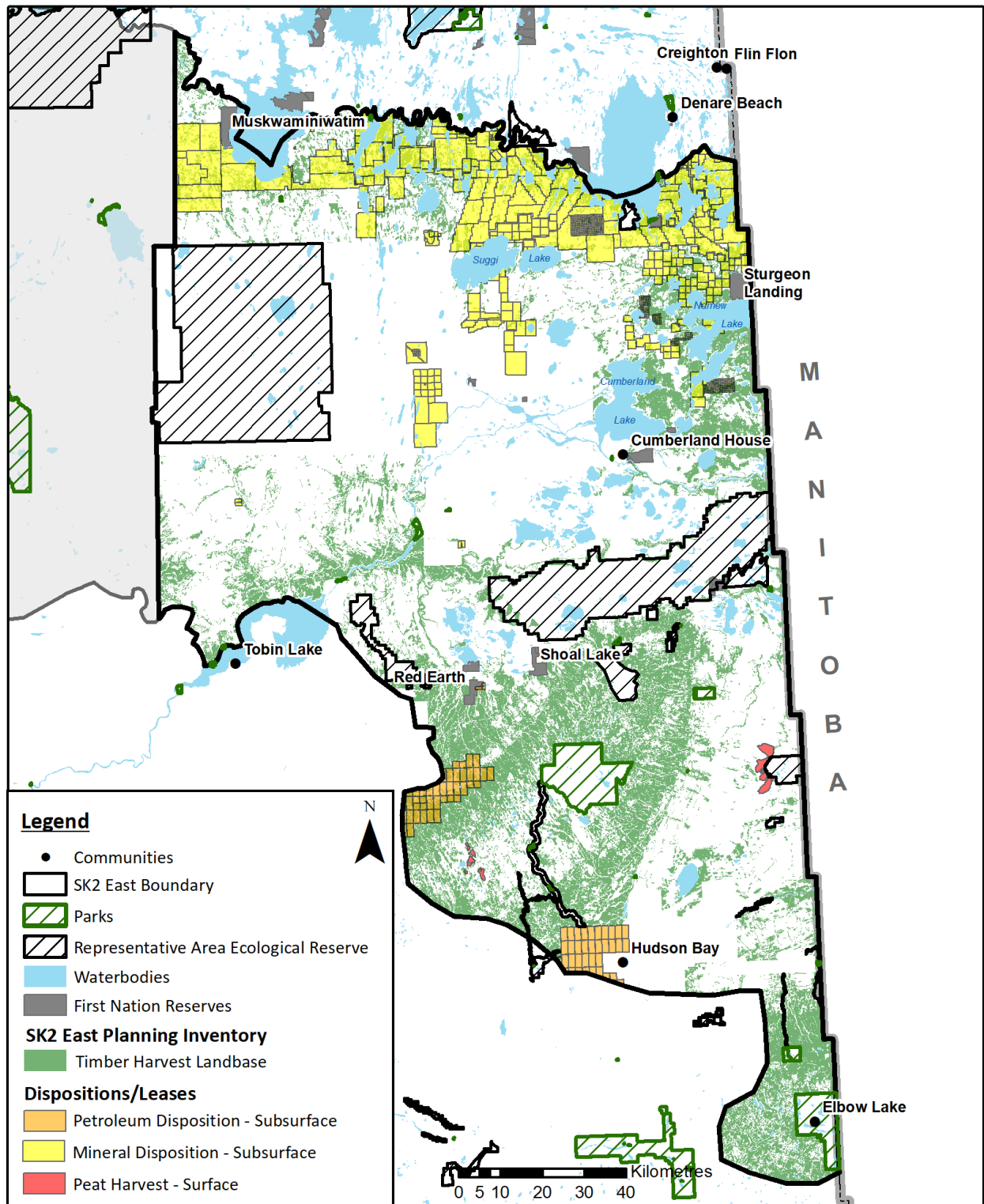


Figure 9. Overview of land use allocations and dispositions in the SK2 East Caribou Administrative Unit (current 2019).

5.2.2 Analysis of Selected Factors

The SK2 East land use scenario analysis focused on manipulating key assumptions for three major factors:

- Utilization of forest harvest allocation;
- Amount of new mineral development; and
- Rate of reclamation of non-permanent linear features.

Changes to forest harvest levels and the rate of mineral development would be expected to result in changes to disturbance levels in SK2 East. Roads and other linear features comprise a significant proportion of the total human-caused disturbance in SK2 East. Understanding how different road reclamation strategies influence disturbance outcomes is important for developing restoration and access management strategies for the region.

5.2.2.1 Forest Harvest Utilization

Different scenarios were created to assess how potential changes in forest harvest utilization influence human-caused disturbance in SK2 East. While the amount of forest harvest may fluctuate due to various factors (i.e. mill capacity or market demand), timber harvest licenses allow for up to 100 per cent utilization of the license allocation. Forest harvest scenario A reflects the recent historical levels of forest harvest utilization in the proportion of each TSA within woodland caribou range, plus moderate growth (Table 8). Forest harvest scenario B projects 100 per cent utilization for the Pasquia Porcupine TSA and 50 per cent utilization for the North East TSA. A maximum harvest level scenario was also considered where forest harvest utilization was set to 100 per cent in both TSAs (Scenario C; Table 8).

Table 8. Forest harvest utilization scenarios.

Scenario	Description of Forest Harvest Utilization
F1*	• 80% utilization for the Pasquia Porcupine TSA • 25% utilization for the North East TSA
F2*	• 100% utilization for the Pasquia Porcupine TSA • 50% utilization for the North East TSA
F3	• 100% utilization for the Pasquia Porcupine TSA • 100% utilization for the North East TSA

*Forest harvest scenario presented in the main range plan document.

Forest Harvest Scenario – Results

Forest harvest scenarios A and B presented in the main range plan document, and described further in Section 5.4, below. Forest harvest scenario C is not presented in the main range plan document but is included here for comparison. At 50 years into the future, forest harvest scenario C resulted in a seven per cent increase in human-caused disturbance levels in SK2 East compared to forest harvest scenario A. The increasing annual area harvested required to support 100 per cent harvest utilization is much higher

than the regenerating rate of historical and current harvest areas and therefore increases substantially.

5.2.2.2 Mineral Development

Three mineral development scenarios (M1, M2 and M3) were examined to understand how changes in the amount of new mineral and associated developments would affect disturbance levels in SK2 East (Table 9). Each scenario in Table 9 reflects increasing amounts of mineral development. Scenario M1 is presented in the main range plan document.

Table 9. Mineral development scenarios.

Scenario	Description of Mineral Development
M1*	One new silica sand mine site, one new base metal processing site, three new base metal extraction sites, and two new peat harvest sites.
M2	One new silica sand mine site, two new base metal processing sites, five new base metal extraction sites, and two new peat harvest sites.
M3	Three new silica sand mine sites, three new base metal processing sites, eight base metal extraction sites, two new peat harvest sites and one new oil shale development.

*Mineral development scenario presented in the main range plan document.

The estimated disturbance footprint for each type of mineral development is listed in Table 10 below. While it is expected that new roads would be required to access each additional development site, they have not been included in the estimates below. The spatial location of presumed new developments was limited to areas within mineral resource assessment ratings 4 to 6 (Figure 8).

Table 10. Estimated disturbance footprint area of potential new mineral development types in the SK2 East Caribou Administrative Unit.

Mineral Development Type	Estimated Disturbance Footprint (km ²)
Silica sand mine site	17
Base metal processing site	3
Base metal extraction site	1.5
Peat harvest site	2.4
Oil shale site (Open pit)	100

Mineral Development Scenarios - Results

Most mine sites and associated access roads have a relatively small disturbance footprint relative to the large size of SK2 East. By year 50 in the modeling simulations, the increasing levels of mineral development represented by scenario M1, M2 and M3 resulted in 0.4 per cent, 0.6 per cent and 0.9 per cent increases, respectively, from current levels of disturbance when combined with forest harvest scenario A and the R2 (moderate) linear feature reclamation scenario. While new mine developments may contribute a low amount of area to the overall disturbance levels in a large region like SK2 East, their

localized effects on caribou habitat and connectivity not reflected in these SK2 East land use scenarios can be significant.

5.2.2.3 Non-Permanent Linear Features

Modeling non-permanent road dynamics was the most challenging part of the scenario analysis. Two factors required consideration:

- The age/status of existing forestry-related roads, and
- The amount and location of future roads.

To approximate the age of existing forestry roads, the non-permanent road layer was intersected with forest harvest blocks from the years 1981-82 to 2020-21. As not all road segments intersected harvest blocks, a search distance of 100 m was added. Some road segments were also associated with multiple harvest blocks. To determine the most likely road age, results were imported to a Microsoft Access database where the age of the youngest associated cut block was used to date the road segment. If a road was not associated with a harvest block, it was assigned an age of 0. Using this process, all non-permanent roads were assigned an age. Assigning an age to all non-permanent roads allowed different reclamation assumptions to be investigated.

Four road reclamation scenarios were examined to understand how changing levels of forestry and non-resource road reclamation would influence disturbance levels in SK2 East (Table 11):

- Road reclamation scenario R1 explored a high level of reclamation that assumed all legacy road reclamation activities would be completed between 2022 and 2032, and that the roads would be fully restored 40 years after the initial reclamation treatments. All current non-permanent roads not associated with modelled future harvest blocks were assumed to be reclaimed by year 50 through a combination of focused reclamation, mitigation offsets and access management planning.
- In road reclamation scenario R2, current forestry in-block roads (class 4) and inter-block bush roads (class 3) are assumed to be reclaimed over time based on their assigned age. This scenario represents a moderate reclamation strategy compared with road reclamation scenario R1.
- In road reclamation scenario R3, only current in-block (class 4) roads are assumed to be reclaimed. This represents a lower reclamation strategy (compared with R2 and R1), as many in-block roads are naturally revegetating with no additional intervention required.
- Road reclamation scenario R4 is a hypothetical scenario where no amount of forestry and non-resource road reclamation occurs over the 50-year period of the scenario analysis. This reclamation scenario was included to better understand the relative influence of reclamation on potential future disturbance levels.

Road reclamation scenarios R2 (moderate reclamation) and R3 (low reclamation) are included in the main range plan document and described further in Section 5.4, below.

Table 11. Linear feature reclamation scenarios.

Scenario	Description of Linear Feature ¹ Reclamation
R1 (high)	All non-permanent roads (class 2-6) are reclaimed unless they intersected a new harvest block.
R2 (moderate)*	Only class 3 and 4 roads are reclaimed unless they intersected a new harvest block.
R3 (low)*	Only class 4 roads are reclaimed unless they intersected a new harvest block.
R4 (none)	No forestry nor non-resource use roads are reclaimed. All roads that are currently on the landscape remain on the landscape. This is a hypothetical scenario used to better understand the relative influence of reclamation on potential levels of future disturbance.

¹ Road classification definitions: Class 2 = improved bush road; Class 3 = bush road; Class 4 = in-block spur road; Class 5 = access road for resource extraction or public backcountry use; Class 6 = other roads unsuitable for timber extraction (Government of Saskatchewan, 2012).

*Linear feature reclamation scenarios presented in main range plan document.

Road Reclamation Scenarios - Results

Reclamation of forestry and non-resource related roads results in a reduction of the total amount of future disturbance in SK2 East. However, given the assumption of a 40-year recovery period, the benefits of road reclamation activities are not realized until near the end of the 50-year scenario period. The definition of reclaimed is therefore important to the calculated level of future total disturbance.

Increasing road reclamation efforts result in reduced disturbance levels by year 50. Road reclamation scenario R1 is the most aggressive reclamation scenario, resulting in a reduction of 4 per cent total disturbance compared with the moderate R2 reclamation scenario. Disturbance levels are correspondingly higher in scenarios where new forest harvest blocks were projected on the landscape with low (road reclamation scenario R3) or no reclamation (scenario R4) of existing non-permanent linear features.

5.2.3 Wildfire

The majority of SK2 East falls within the primary and secondary timber areas and will continue to be in the high value commercial forest full response wildfire management zone for the duration of the 50-year scenario period. Historical wildfire disturbance rates in SK2 East have been lower than in the SK2 Central and SK2 West Caribou Administrative Units. To calculate future total disturbance, new wildfire disturbance was added aspatially at a constant burn rate of 26 km² per year (0.2 per cent of the total SK2 East area per year). This average wildfire rate was calculated from the 40-year historical wildfire record. While a constant rate was applied for the purpose of calculations, it is fully recognized that many years

have no wildfire activity, and that individual wildfires vary greatly in size and severity.

Wildfire Scenario - Results

The constant 26 km² per year wildfire rate contributes 4 to 6 per cent of the total habitat disturbance over the 50-year period.

The effect of climate change on wildfire was not assessed in this analysis, but climate change may result in an increased amount of wildfire disturbance in the Boreal Plain. However, the magnitude of this potential increase and how wildfire suppression activities in the commercial forest may respond are uncertain. Given this situation, the wildfire analysis approach used in these scenario analyses should be viewed as a minimum amount of new future wildfire disturbance on the landscape.

5.3 Summary

Key findings from the SK2 East scenario analysis including the following:

Forest harvest utilization

- Forest harvest levels and associated in-block and inter-block roads are the main drivers of the level of habitat disturbance in SK2 East. Reduced forest harvest utilization results in reduced habitat disturbance. Scenario results suggest that under forestry scenario F1 (80 per cent utilization in Pasquia Porcupine TSA and 25 per cent utilization in North East TSA), cumulative disturbance levels can be maintained at the recommended federal recovery strategy level of 35 per cent. The highest forest harvest utilization modelled (forestry scenario F3) results in SK2 East exceeding the federal recovery strategy 65 per cent undisturbed habitat threshold, regardless of other developments or any rate of reclamation activities.
- However, these results should be interpreted with the following considerations.
 - The assumption of forest harvest blocks and other human-caused disturbances requiring 40 years to recover to an undisturbed habitat condition is central to this finding.
 - Most forest harvesting does not occur in high value caribou habitat.

Mineral development

- Due to their relatively small footprint in comparison to the large area of SK2 East, moderately increasing amounts of mineral and peat harvest development result in minor increases to the total amount of habitat disturbance in SK2 East.
- However, while the regional effects of a mine or similar development can be relatively low, the local effects may be significant. Mine sites, quarries and peat harvest operations typically operate for many years prior to their operations ceasing and their footprints being reclaimed. The direct footprint and its adjacent indirect effects may therefore impact caribou habitat for several decades, potentially resulting in caribou avoiding or using such areas less frequently. It is recognized that ongoing progressive reclamation could reduce the duration of these effects.

Linear features

- Successful and rapid reclamation of non-permanent resource roads will be required to maintain

the existing level of habitat disturbance in SK2 East or achieve a reduced level of disturbance.

- The road reclamation scenarios examined in this analysis suggest a 4 per cent reduction in cumulative disturbance can be achieved by effective road reclamation alone. Reclamation would allow for similar levels of resource-related land use as currently observed while maintaining cumulative disturbance below the federal recovery strategy guideline of 65 per cent.
- However, given the assumption of a 40-year recovery period, the benefits of road reclamation activities are not realized until near the end of the 50-year scenario period. Like forest harvesting, the definition of reclaimed is therefore important to the projected level of future habitat disturbance.

Wildfire

- SK2 East has experienced much lower levels of wildfire than SK2 Central or SK2 West.
- The calculated average annual wildfire rate of 26 km² (2,600 ha) per year contributes 4 to 6 per cent of the total habitat disturbance over the 50-year period.
- While a constant wildfire rate was applied, it should be recognized that the amount of area burned in any single year can vary greatly, with individual wildfires varying in size and severity.
- The wildfire analysis approach used in these scenario analyses should be viewed as a minimum amount of new future wildfire disturbance on the landscape.

5.4 Scenarios for Main Range Plan Document

Based on expert opinion, plausible assumptions were selected from the sector scenarios to create two main land use scenarios for the main range plan document. Land use Scenario A assumed a forest harvest utilization of 80 per cent for the Pasquia Porcupine TSA and 25 per cent for the North East TSA, while Land Use Scenario B assumed a forest harvest utilization of 100 per cent for the Pasquia Porcupine TSA and 50 per cent for the North East TSA. Both scenarios assumed a constant mineral development rate of seven projects (mineral scenario M1) and all other factors remained constant (wildfire rate, other land uses). Land Use Scenario A and B results were also examined under lower and moderate rates of non-permanent linear feature reclamation. Table 12 illustrates the main sector assumptions for Land Use Scenario A and Land Use Scenario B.

Table 12. Forest harvest, mineral development and linear feature reclamation assumptions associated with Land Use Scenario A and Land Use Scenario B.

Scenario	Land Use Scenario Assumptions
Land Use Scenario A	<u>Forest Harvest Utilization (F1 forest harvest scenario)</u> 80 per cent for the Pasquia Porcupine TSA 25 per cent for the North East TSA
	<u>Mineral Development (M1 mineral development scenario)</u> One new silica sand mine site, one new base metal processing site, three new base metal extraction sites, and two new peat harvest sites.
	<u>Linear Feature Reclamation</u> <i>Moderate (R2) reclamation scenario</i> - Only class 3 and 4 roads are reclaimed unless they intersected a new harvest block. <i>Low (R3) reclamation scenario</i> - Only class 4 roads are reclaimed unless they intersected a new harvest block.
Land Use Scenario B	<u>Forest Harvest Utilization (F2 forest harvest scenario)</u> 100 per cent for the Pasquia Porcupine TSA 50 per cent for the North East TSA
	<u>Mineral Development (M1 mineral development scenario)</u> One new silica sand mine site, one new base metal processing site, three new base metal extraction sites, and two new peat harvest sites.
	<u>Linear Feature Reclamation</u> <i>Moderate (R2) reclamation scenario</i> - Only class 3 and 4 roads are reclaimed unless they intersected a new harvest block. <i>Low (R3) reclamation scenario</i> - Only class 4 roads are reclaimed unless they intersected a new harvest block.

5.4.1 Results

Land Use Scenario A projected that human-caused disturbance levels will either slightly increase to 28 per cent or potentially increase to 32 per cent in the SK2 East area. The amount of total disturbance (i.e. wildfire and human-caused with a 500 metre buffer) in the SK2 East area are also likely to range between 30 and 33 per cent 50 years into the future (current total disturbance level is 31 per cent).

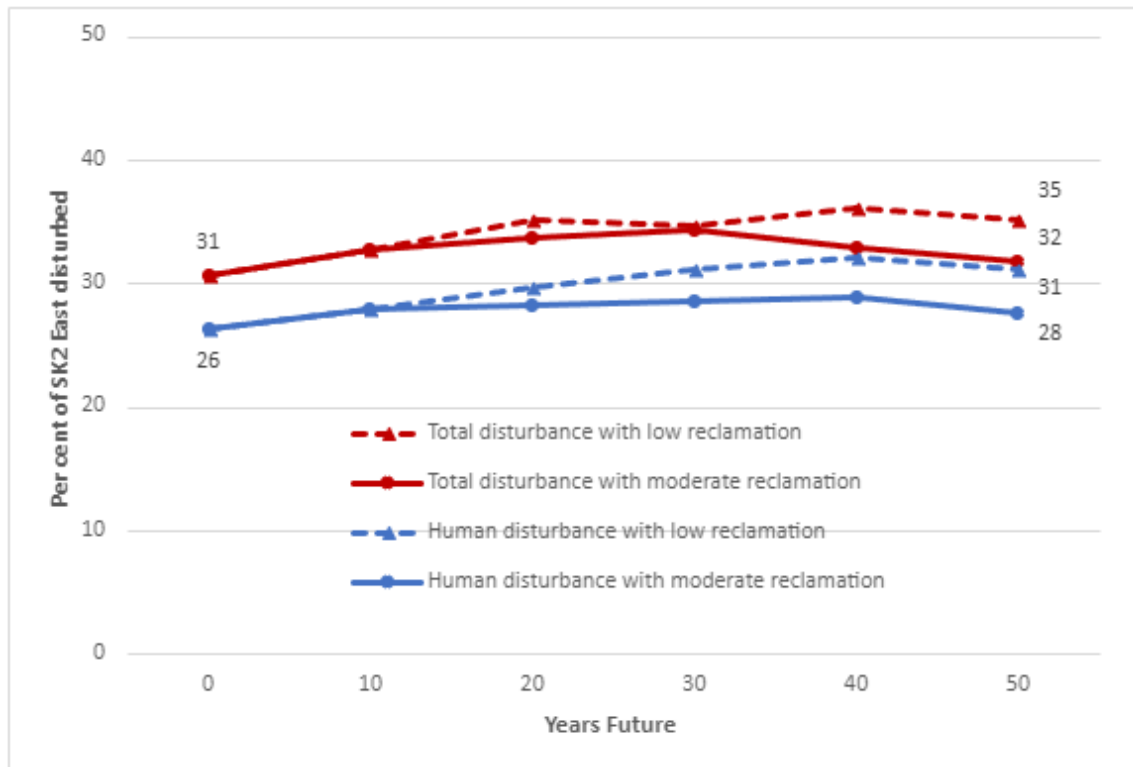


Figure 10. Projected total and human-caused disturbance in the SK2 East Caribou Administrative Unit resulting from Land Use Scenario A and either moderate or low linear feature reclamation.

Increasing the forest harvest utilization to 100 per cent for the Pasquia Porcupine TSA and 50 per cent for the North East TSA results in a rise in human-caused disturbance from the current amount of 26 per cent to a range of 33 to 35 per cent (Figure 11).

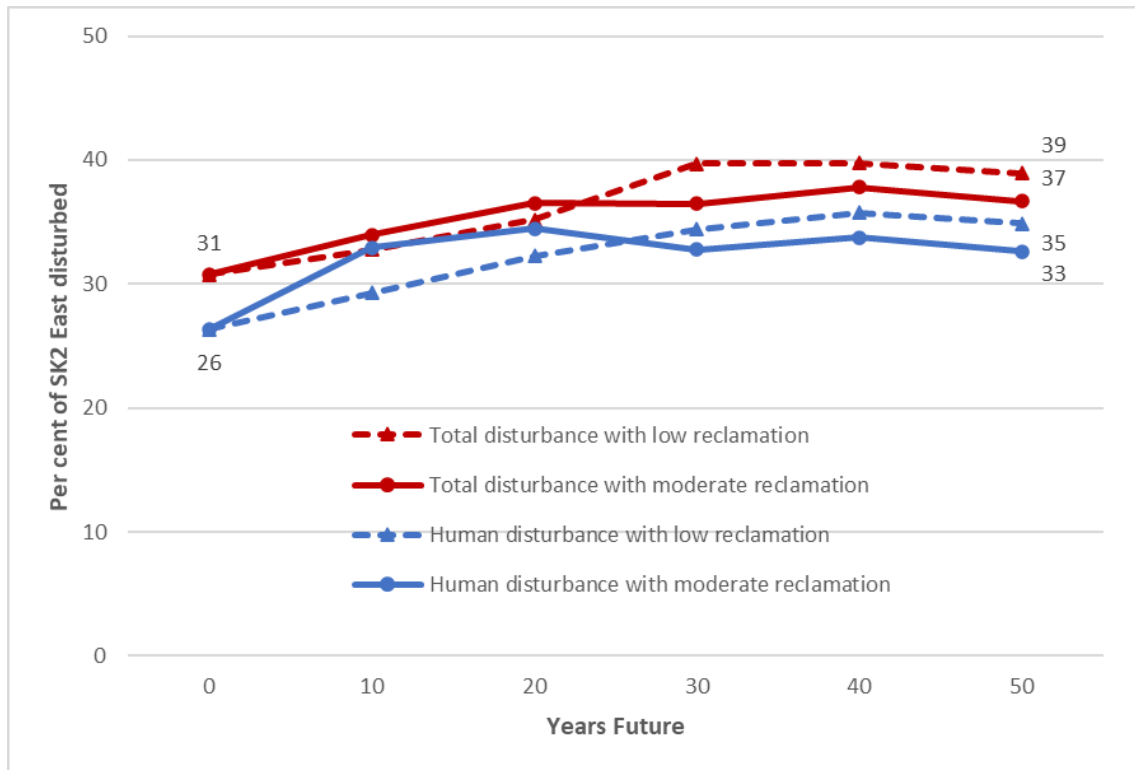


Figure 11. Projected total and human-caused disturbance in the SK2 East Caribou Administrative Unit resulting from Land use Scenario B and either moderate or low linear feature reclamation.

Figures 12, 13 and 14 show potential changes in the locations of undisturbed habitat over the 50-year time horizon for Land Use Scenario A with moderate reclamation. It is important to note that in future years, newly burned areas (i.e. wildfire) are not displayed spatially, as it is not possible to show the exact location or size of future wildfire events. Therefore, only future human-caused disturbances resulting from planned forest harvest and projected mineral extraction are shown, as well as the locations of linear feature reclamation. Wildfire is however accounted for in the Habitat Balance Sheet (Table 13).

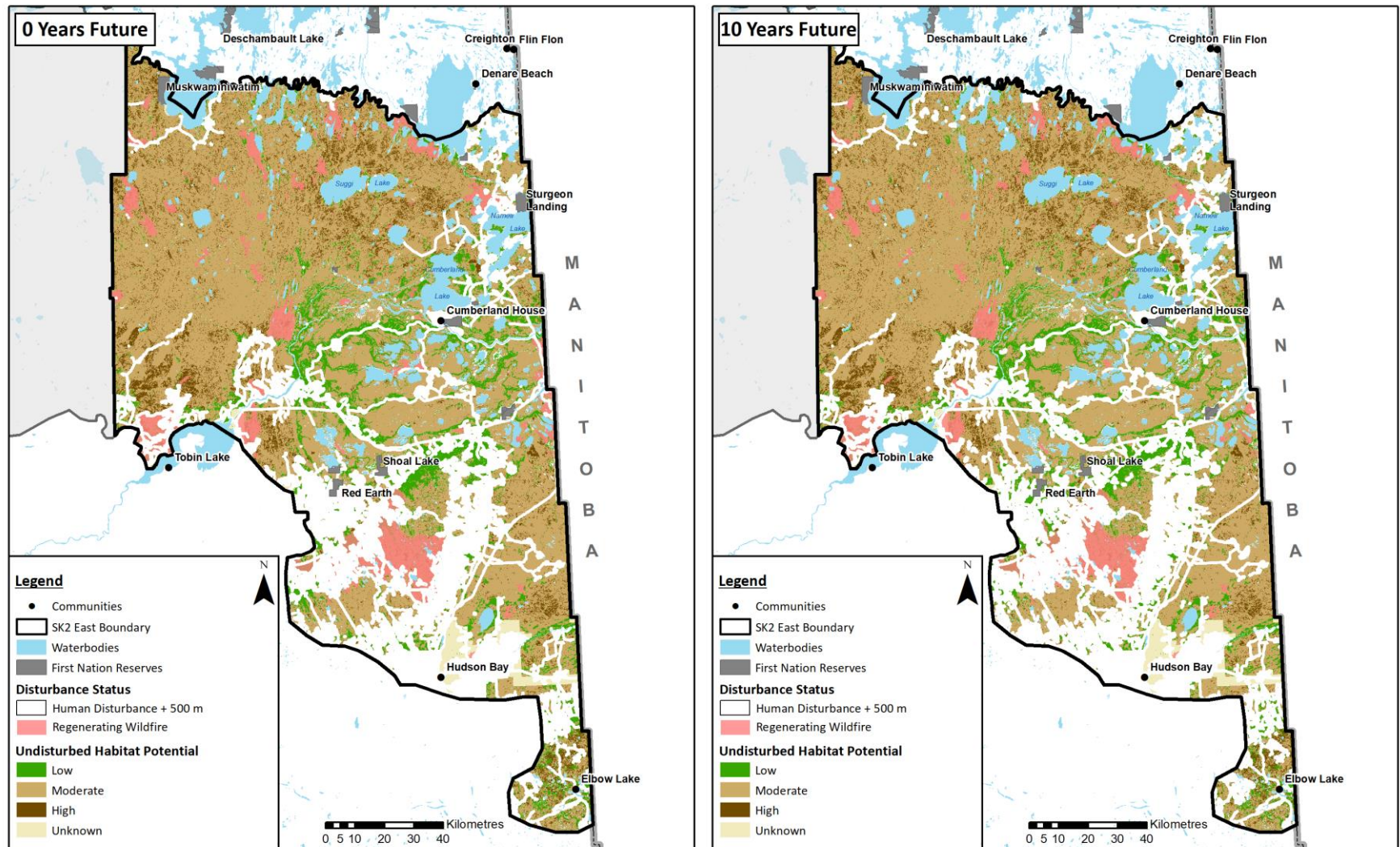


Figure 12. Land Use Scenario A with moderate reclamation: Projected levels of human-caused disturbance 0 and 20 years into the future in the SK2 East Caribou Administrative Unit.

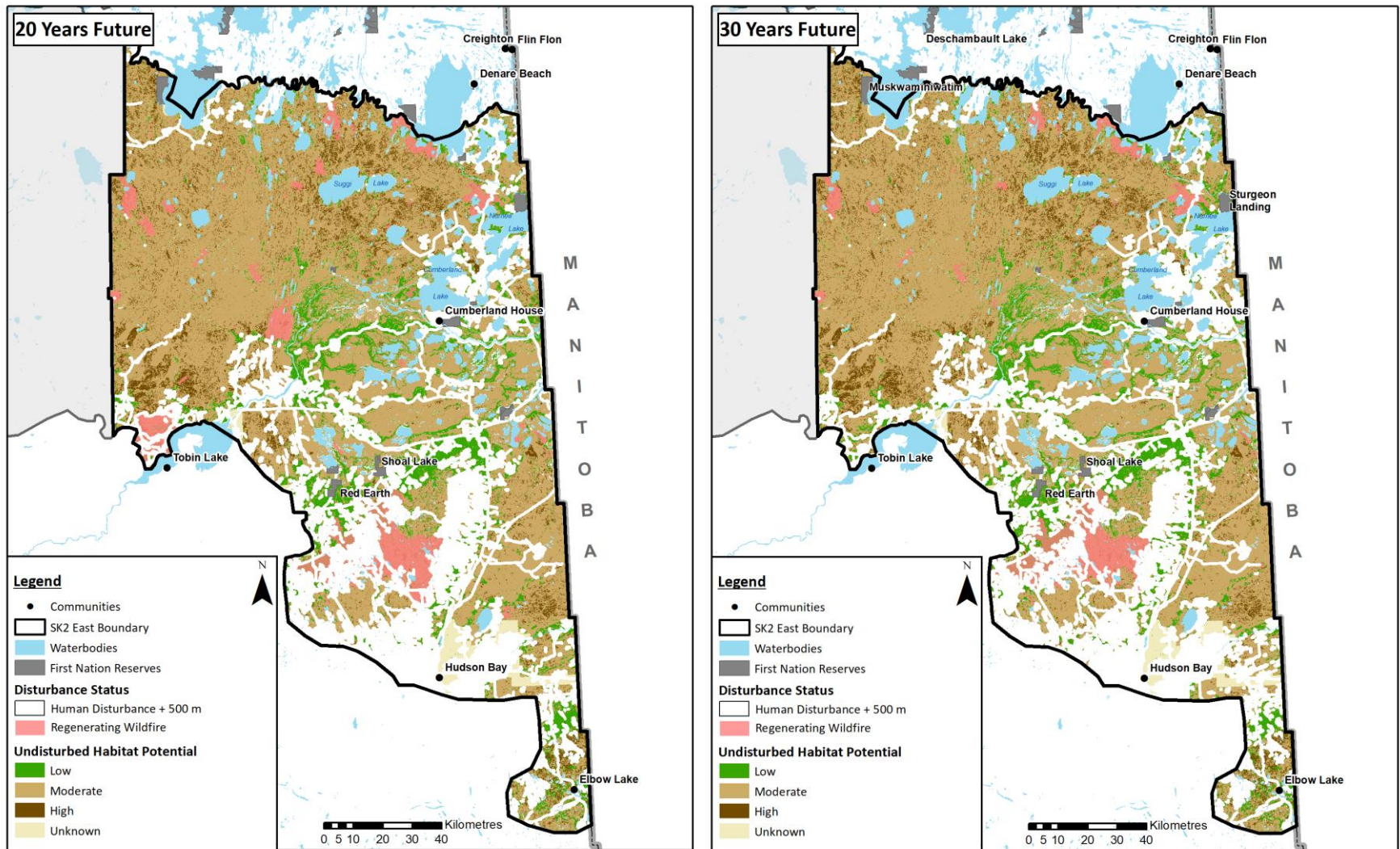


Figure 13. Land Use Scenario A with moderate reclamation: Projected levels of human-caused disturbance 20 and 30 years into the future in the SK2 East Caribou Administrative Unit.

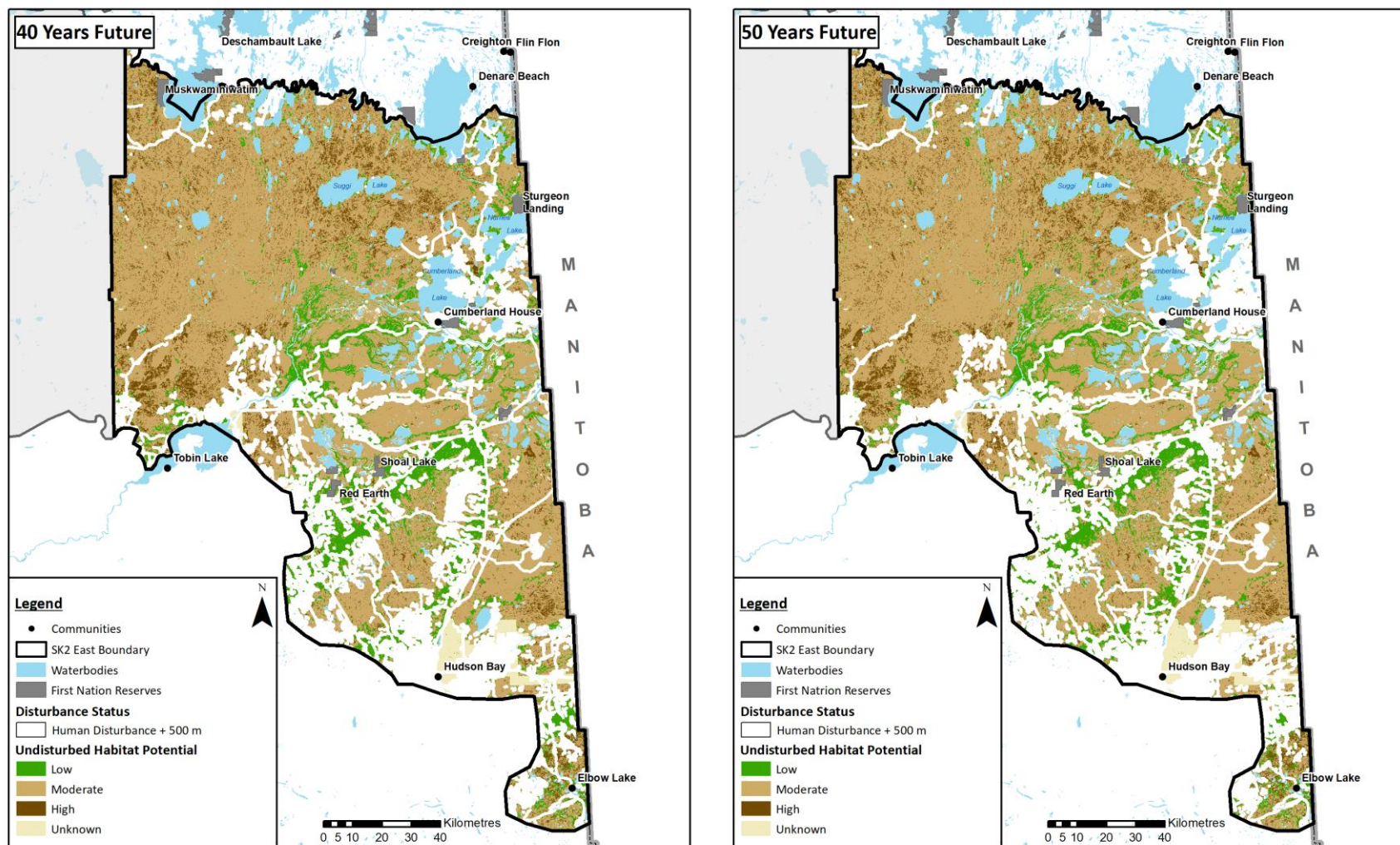


Figure 14. Land Use Scenario A with moderate reclamation: Projected levels of human-caused disturbance 40 and 50 years into the future in the SK2 East Caribou Administrative Unit.

5.4.2 Habitat Balance Sheet

A habitat balance sheet tracks the projected net balance of disturbed and undisturbed habitat resulting from new human-caused disturbance, reclamation, and natural regeneration of disturbed areas (ECCC 2016). Table 13 reports the projected habitat balance for the next 50 years in SK2 East based on results of Land Use Scenario A, other land use assumptions (mineral, peat harvesting, wildfire, etc.), and low and moderate reclamation assumptions for non-permanent linear features. The habitat balance is reported by decade over a period of 50-years. As disturbed habitat ages beyond 40 years, it moves from the disturbed to the undisturbed category. Transitions are tracked in the habitat balance sheet and show the net balance between disturbed and undisturbed habitat.

Table 13. Habitat balance summary table resulting from Land Use Scenario A with moderate and low reclamation of non-permanent linear features.

Years Future		Undisturbed habitat		Disturbed habitat											
		TOTAL undisturbed habitat		TOTAL disturbed habitat (Total Permanent + Net Non-permanent + Net fire)		Permanent human-caused disturbance (including 500m buffer)		Non-permanent human-caused disturbance (including 500m buffer)						Wildfire Disturbance (no buffer)	
								TOTAL		TOTAL (Non-overlapping new + 10-40 yr. non-permanent disturbance)		New (< 10-year-old)		Non-permanent human-caused disturbance 10-40 years old (erased by new)	
		per cent	km²	per cent	km²	per cent	km²	per cent	km²	per cent	km²	per cent	km²	per cent	km²
0		69	17,545	31	7,793	6	1,612	20	5,068	n/a	n/a	n/a	n/a	4	1,113
10		67	17,041	33	8,297	7	1,702	21	5,376	3	671	19	4,705	5	1,219
20		66	16,770	34	8,568	7	1,728	21	5,428	3	644	19	4,784	6	1,404
30		66	16,646	34	8,692	7	1,745	22	5,502	2	554	20	4,949	6	1,462
40		67	16,984	33	8,354	7	1,766	22	5,566	2	507	20	5,059	4	1,022
50	Moderate Reclamation	68	17,295	32	8,044	7	1,796	21	5,225	2	450	19	4,775	4	1,022
	Low Reclamation	65	16,404	35	8,934	7	1,796	24	6,116	1	326	23	5,790	4	1,022

6.0 APPENDIX E: Examples of Legislation Describing Protection and Conservation Measures

6.1 Important Provincial Statutes

Saskatchewan has at least 14 statutes that are relevant in affording protection of habitat and species on provincial lands (e.g. Table 12 of the main range plan document). Of these statutes, *The Provincial Lands Act, 2016* works in conjunction with *The Environmental Management and Protection Act, 2010* and *The Forest Resources Management Act, 1996* to provide strong legislative authorities for future land use arising from woodland caribou range plans.

6.2 Regulatory Habitat Protection and Conservation Examples

Saskatchewan's legislation provides considerable protection and conservation measures for both habitat and species. Various parts, sections, schedules, and clauses of legislation outline the primary mechanisms by which habitat or species may be protected, managed, or conserved on provincial Crown lands. Sections illustrating specific measures relevant to woodland caribou conservation identified in *The Forest Resources Management Act*, *The Environmental Management and Protection Act, 2010*, *The Provincial Lands Act, 2016*, and *The Wildlife Act, 1998* are presented in Tables 12, 13, 14, and 15. The illustrative sections are the most relevant, least duplicative and cover the authority, responsibility, compliance, and protection of both habitat (e.g. land) and species. For brevity, the associated regulations and Saskatchewan Environmental Code have been omitted.

Table 14. Examples of specific legislative sections describing protection and conservation measures of habitat (land) in *The Forest Resources Management Act*.

<i>The Forest Resources Management Act</i>	
Section	Description
3	Purpose The purpose of this Act is to promote the sustainable use of forest land for the benefit of current and future generations by balancing the need for economic, social and cultural opportunities with the need to maintain and enhance the health of forest land.
5	Minister responsibilities The minister is responsible for all matters not by law assigned to any other minister, ministry, branch, or agency of the Government of Saskatchewan relating to the acquisition, promotion, conservation, development, enhancement, maintenance, management, protection, and utilization of forest resources.
6	Powers of minister The minister...may: (c) specify terms governing the harvesting, ...of forest products.; (e) control the use of pesticides on land within the provincial forest; (h.1) specify requirements and procedures for the treatment, ... and disposal of infected material; (i.1) specify activities on forest land that are required to be registered with the ministry; (i.3) develop or establish standards or requirements respecting any matter governed by this Act; and (j) do any thing the minister considers necessary to conserve, develop, enhance, maintain, manage, protect and utilize forest products on forest land in a sustainable manner. (4) ... the minister may approve criteria, ... as an alternative to those set out in the code if the minister is satisfied that: (a) those alternative criteria, ... provide an equivalent or better level of protection to Crown resource lands or forest products on Crown resource lands; and (b) it is in the public interest to do so.
7	Power to enter into agreements (1) The minister may enter into agreements ... for the purposes of ... (a) the protection, on any land, of forests, trees or other arboraceous vegetation from damage...; (b) the protection of watersheds; (c) the renewal and reclamation of all components of a forest ecosystem; (d) the acquisition, promotion, conservation, development, enhancement, maintenance, management, protection and utilization of forest resources; (i) the location, ... closure, management and reclamation of roads, road allowances and rights of way within the provincial forest ...
12	Provincial forests (1) The Lieutenant Governor in Council, by regulation, may designate any Crown resource land as a provincial forest to be managed in a sustainable manner for the purposes of conserving, developing, enhancing, maintaining, managing, protecting, and utilizing the forest resources on that land. (2) All lands designated as provincial forest are withdrawn from disposition, sale, settlement, or occupancy except pursuant to the authority of this Act and the regulations.
17	Forest products Crown property (1) All forest products, including forest products resulting from renewal, are property of the Crown. (2) ... no person shall harvest or acquire any right or property in any forest product except in accordance with this Act, the regulations or the code.

Table 14. (continued) Examples of specific legislative sections describing protection and conservation measures of habitat (land) in *The Forest Resources Management Act*.

<i>The Forest Resources Management Act</i>	
Section	Description
20	Designations by the minister Subject to the regulations, the minister, in any licence respecting the harvesting of forest products, may set out the following: (a) the size of harvest areas; (b) harvest methods; ... (e) conditions governing location, construction and use of roads; (f) any other terms that the minister considers appropriate.
24	Import controls No person, without the written authority of the minister, shall import any thing into Saskatchewan that, in the minister's opinion, could cause the spread of insects or diseases harmful to Saskatchewan's forests, trees or other arboraceous vegetation.
27	Renewal activities A licensee shall carry out renewal activities in accordance with the regulations and the terms of the licensee's licence.
38	Forest management plans and operating plans (1) Subject to subsection (1.1), before commencing any activity authorized by a forest management agreement, the licensee shall submit to the minister for approval: (a) a forest management plan for the full term of the agreement; and (b) a five-year operating plan.
46	Preparation of plans (1) A licensee who holds a term supply licence shall prepare the forest management plan and the operating plan in accordance with: (a.1) the code; (a.2) if the plan is a development within the meaning of <i>The Environmental Assessment Act</i> , the requirements of that Act ...
47	Activities to conform to plans (1) The operations of a licensee who holds a term supply licence are to conform to: (a) the approved forest management plan, ... and (b) the approved operating plan ...
49.3	Approval or refusal of plan re forest product permit (2) The minister shall review a plan ... and: (a) approve the plan if, in the minister's opinion, the plan complies with this Act and it is in the public interest to do so; or (b) refuse to approve the plan if the minister is not satisfied that: (i) the plan complies with this Act; or (ii) it is in the public interest to approve the plan.
49.4	Activities to conform to plans (1) ... a licensee who holds a licence respecting a forest product permit shall ensure that the operations of the licensee conform to the approved operating plan, including any terms imposed ...
50.1	Changes to approval (1) The minister may cancel, amend, alter, or suspend any approved operating plan or any licence other than a licence issued with respect to a forest management agreement, in whole or in part, if: (a) the ... operating plan or licence has resulted or will result in a contravention of any Act or regulation or any other law ...
56	Minister may establish roads (1) ... the minister may construct roads within a provincial forest and may: ... (c) by order, close the whole or any specified part of those roads.

Table 14. (continued) Examples of specific legislative sections describing protection and conservation measures of habitat (land) in *The Forest Resources Management Act*.

<i>The Forest Resources Management Act</i>	
Section	Description
57	Construction of roads (1) ... no person shall clear any forest land for the purpose of constructing a road, trail or other right of way, except with prior authorization from the minister or in accordance with the regulations.
58	Closure of roads (1.1) ... if the minister considers it necessary for the purposes of managing or protecting forest resources, the minister may close, by order, or require any person responsible for the construction or maintenance of the road to close, any road within a provincial forest. (2) If a road is closed ... no person shall operate a vehicle on that road, and no person shall be a passenger in or on a vehicle that is on that road ...
61	Damage prevention and repair (1) An officer may make an order requiring any person to stop harvesting or to stop any activity ... that: ... (b) the person has done or is doing anything that: (i) has damaged, is damaging or is likely to damage Crown resource land or forest products on Crown land; ... (4) During the period of the officer's order, the minister may make an order: ... (b) directing the person to take any action the minister considers appropriate to repair the damage or prevent further damage ...
62	Forest remediation order 1(1) If ... activities being carried out on Crown resource land are being carried out in contravention of this Act, the regulations or the code and may cause, are causing or have caused damage to Crown resource lands or forest products on Crown resource lands, the minister may issue a forest remediation order... (3) ... the minister may, in a forest remediation order, require a person to whom the forest remediation order is directed to do all or any of the following: (a) investigate the situation; (b) lessen or prevent further damage to the Crown resource land or forest products; (c) remedy the damage; (d) restore the Crown resource land or forest products to a condition satisfactory to the minister; (g) cease or suspend any activity for a period specified in the order or permanently; (4) A forest remediation order may specify: (a) the method or procedures to be used in carrying out the measures required by the order ...; and (b) the period within which any measure required by the order is to be commenced ...
63	Duty re designated insects and diseases 1(1) Every person who owns, occupies, or controls any land that is designated land shall take measures to remove, dispose of, control and prevent the spread of all designated insects or diseases on that land.
78	Administrative penalty (1) The minister may assess a penalty in the prescribed amount against any person if the person: ... (c) harvests forest products in contravention of the terms of a licence, an approved plan or the code ...

Table 14. (complete) Examples of specific legislative sections describing protection and conservation measures of habitat (land) in *The Forest Resources Management Act*.

<i>The Forest Resources Management Act</i>	
Section	Description
79	Offences and penalties (1) No person shall: (a) harvest forest products except in accordance with this Act, the regulations, and the code; (d) fail to comply with the terms of any licence or plan approved pursuant to this Act, the regulations or the code. (2) Any person who contravenes any provision of this Act, the regulations or the code is guilty of an offence and liable on summary conviction: (a) in the case of an individual, to a fine not exceeding \$250,000, to imprisonment for a term not exceeding five years or to both; (b) in the case of a corporation, to a fine not exceeding \$1,000,000.
80	Additional powers of court (1) In addition to any penalty imposed on a person ... the court ..., may make an order doing any one or more of the following: (a) prohibiting the person from doing any act or engaging in any activity that, in the opinion of the court, may result in the continuation of the offence; (b) directing the person to take any action the court considers appropriate to: (i) repair any damage to any Crown resource land or forest products on Crown land that resulted from the commission of the offence; or (ii) prevent any damage to any Crown resource land ...
99	Regulations (1) The Lieutenant Governor in Council may make regulations: (g) governing the alteration or disturbance of any forest vegetation on Crown land; ... (r) respecting tree preservation and the renewal, reforestation or reclamation of Crown resource land or portions of Crown resource land ...

Table 15. Examples of specific legislative sections describing protection and conservation measures of habitat (land) in *The Environmental Management and Protection Act, 2010*.

<i>The Environmental Management and Protection Act, 2010</i>	
Section	Description
3	Responsibilities and powers of minister re the environment (2) ... the minister may: (a) create, develop, adopt, co-ordinate and implement policies, strategies, objectives, guidelines, programs, services and administrative procedures or similar instruments respecting the management, protection and use of the environment; (b) sponsor, undertake and co-ordinate planning, research and investigations respecting the environment; (c) establish a system of monitoring the quality of the environment and collect, process, correlate, store and publish data on: (i) the quality of the environment; and (ii) activities that have or may have an adverse effect; ... (g) provide information to the public on: (i) the quality and use of the environment; (ii) the quantity of any substances or things in the environment; and (iii) any activity that has an adverse effect; (3) The minister shall recommend to the Lieutenant Governor in Council the adoption of a code. (5) ... at the request of a person proposing to engage in an activity governed by this Act, the minister may approve criteria, terms, conditions or requirements submitted by that person as alternatives to those set out in the code if the minister is satisfied that: (a) those alternative criteria, terms, conditions or requirements provide an equivalent or better level of safety or protection to human health and the environment; and (b) it is in the public interest to do so.
5	Preparation of report (2) The minister shall ensure that a report is prepared every two years, to be known as the State of the Environment Report, concerning the current condition of the environment in Saskatchewan and the relationships between the condition of the environment and the economy of Saskatchewan. (3) The minister may use any environmental indicators that the minister considers relevant in the preparation of a report. (4) The report must: (a) present baseline information on the environmental indicators...; (c) identify, and present analyses, respecting how the environment is changing; and (d) identify emerging concerns for the environment.
8	Prohibition on discharges (1) No person shall discharge or allow the discharge of a substance into the environment in an amount, concentration, or level or at a rate of release that may cause or is causing an adverse effect ...
10	Duty to take immediate action ... any person who owns or occupies land respecting which a report is filed ... shall, as soon as possible, take all reasonable emergency measures consistent with public safety: (a) to repair or remedy any undue risk; or (b) to reduce or mitigate danger to life, health, property or the environment that results or that may reasonably be expected to result from the discharge of the substance.
14	Corrective action plan (1) If a site assessment discloses that the site is an environmentally impacted site, the person required to conduct the site assessment ... shall prepare a corrective action plan that satisfies any prescribed requirements or any requirements set out in the code.

Table 15. (continued) Examples of specific legislative sections describing protection and conservation measures of habitat (land) in *The Environmental Management and Protection Act, 2010*.

<i>The Environmental Management and Protection Act, 2010</i>	
Section	Description
16	Minister's consideration of corrective action plan (1) The corrective action plan ... must be immediately submitted to the minister for review after it has been prepared. (2) If the minister is not satisfied with the corrective action plan, the minister may require that the person preparing the corrective action plan resubmit it with any changes that the minister may direct.
22	Registry (1) The minister shall establish an environmentally impacted sites registry. (2) The registry is to contain the following documents that are accepted or received by the minister: (a) notices of site condition; (b) corrective action plans; (c) site assessments; (d) environmental protection orders ...
38	Offences under Part ... (4) ... no person shall directly or indirectly: (a) alter or cause to be altered the configuration of the bed, bank or boundary of any river, stream, lake, creek, marsh or other watercourse or water body; (b) remove, displace or add any sand, gravel or other material from, in or to the bed, bank or boundary of any river, stream, lake, creek, marsh or other watercourse or water body; or (c) remove vegetation from the bed, bank or boundary of any river, stream, lake, creek, marsh or other watercourse or water body. (5) A person may engage in an activity mentioned in subsection (4) if expressly authorized to do so pursuant to: (a) this Act or the regulations ...
49	Prohibition respecting abandonment of waste No person shall discard or abandon, or cause to be discarded or abandoned, or allow to be discarded or abandoned, any waste other than: (a) in a waste management works for which a permit has been issued ...
55	Immediate environmental protection orders (1) ..., if the minister is satisfied that a person is doing any thing or carrying out any activity that may cause or is causing an immediate or significant adverse effect, the minister may issue an immediate environmental protection order that is directed to a person requiring that person: (a) to immediately cease or suspend doing the thing or carrying out the activity identified in the order; and (b) to do any other thing that the minister considers appropriate ...
56	Environmental protection orders (1) If the minister is satisfied that a person is doing any thing or carrying out any activity that may cause or is causing an adverse effect, the minister may issue an environmental protection order against a person responsible directing that person to take any measures that the minister considers necessary to remedy, minimize, mitigate or prevent the adverse effect. ... (6) An environmental protection order may specify: (a) the method or procedures to be used in carrying out the measures required by the order and the manner in which those methods or procedures are to be carried out; and (b) the period within which any measure required by the order is to be commenced and the period within which the order or any portion of the order is to be complied with.

Table 15. (complete) Examples of specific legislative sections describing protection and conservation measures of habitat (land) in *The Environmental Management and Protection Act, 2010*.

<i>The Environmental Management and Protection Act, 2010</i>	
Section	Description
84	Offences (1) No person shall: ... (c) fail to comply with an order of the minister issued pursuant to this Act or the regulations; or (d) fail to comply with any provision of this Act, the regulations, or the code. (2) ... every person who contravenes a provision of this Act, the regulations or the code, for which no penalty is otherwise provided, is guilty of an offence and liable on summary conviction to: (a) a fine not exceeding \$1,000,000 for each day or part of a day during which the offence continues; (b) imprisonment not exceeding three years; or (c) both that fine and imprisonment.
85	Additional order from convicting court In addition to or instead of any penalty imposed pursuant to this Act, the convicting court, having regard to the nature of the offence and the circumstances surrounding its commission, may make an order doing one or more of the following: (c) directing the convicted person to repair, mitigate or minimize any damage to the environment that resulted from the commission of the offence in a manner and within the period specified by the order, or to restore or reclaim any property that has been damaged as a result of the commission of the offence in a manner and within the period specified by the order; (d) requiring the convicted person to take steps to prevent any damage to the environment that may result from the commission of the offence in a manner and within the period specified by the order ...

Table 16. Examples of specific legislative sections describing protection and conservation measures of habitat (land) in *The Provincial Lands Act, 2016*.

<i>The Provincial Lands Act, 2016</i>	
Section	Description
2-1	Minister's responsibilities (1) The minister is responsible for all matters ... relating to the administration of provincial land. (2) For the purpose of carrying out the minister's responsibilities, the minister may do all or any of the following: (a) create, develop, adopt, coordinate, and implement policies, strategies, objectives, guidelines, programs, services, and administrative procedures or similar instruments respecting the administration of provincial land; (b) sponsor, undertake and coordinate planning, research and investigations respecting provincial land; (d) subject to the regulations, conduct public hearings or inquiries, or appoint a person to conduct public hearings or inquiries, respecting the use, management, establishment or enlargement of any ecological reserve or the revocation of a designation of any ecological reserve ...
2-2	Administration of provincial land (2) The minister may: (a) establish a planning area; and (b) prepare a land use plan for the purpose of coordinating policies, programs, and activities to guide existing and potential uses of provincial land ...
2-4	Rights only acquired in accordance with this Act or the regulations (3) Any disposition issued pursuant to this Act or the regulations with respect to provincial land is not binding on the Crown until the minister signs the disposition.
2-6	Leases, permits, licences, easements, and other dispositions (1) Subject to the regulations, the minister may issue any or all of the following dispositions on any terms and conditions that the minister considers appropriate: (a) a lease of any provincial land; (b) a permit with respect to any provincial land; (c) a licence with respect to any provincial land; (d) an easement over, under or through any provincial land ...
2-7	Categories and uses of vacant provincial land (1) The minister may establish categories of vacant provincial land and permissible uses for those categories of provincial land, including restricting the activities that may be conducted on any identified parcel of vacant provincial land or any category of vacant provincial land. (2) ... the minister shall issue an order that specifies the nature of the restriction and the land to which the restriction applies.
2-12	Amendment or cancellation of authorization, consent, or disposition ... if the minister is satisfied that any person has obtained an authorization, consent or disposition by misrepresenting or failing to disclose any material fact, the minister may: (a) amend or correct the authorization, consent or disposition; or (b) cancel the authorization, consent or disposition.
2-16	Amendment of terms and conditions or withdrawal of land from or cancellation of disposition (2) ... if the minister is of the opinion that it is in the public interest to do so, the minister may amend a disposition,

Table 16. (continued) Examples of specific legislative sections describing protection and conservation measures of habitat (land) in *The Provincial Lands Act, 2016*.

<i>The Provincial Lands Act, 2016</i>	
Section	Description
2-19	Liability continues The cancellation of a disposition by the minister, or the termination of a disposition by a disposition holder, does not: ... (b) relieve the disposition holder of any outstanding debt or other obligation owing to the Crown with respect to the disposition.
2-23	Minister's consent required re certain improvements (1) A disposition holder who intends to construct or alter an improvement on provincial land shall obtain the written consent of the minister before commencing the construction or alteration.
2-24	Restoration of provincial land—removal of improvements or other property, etc. ... (2) A disposition holder shall restore the provincial land that is the subject of his or her disposition to a condition satisfactory to the minister... (3) If the minister believes the disposition holder has not satisfactorily restored the provincial land, the minister may issue a written order to the disposition holder requiring the disposition holder to restore the provincial land in the manner and within the period set out in the order.
3-1	Ecological reserves designated The Lieutenant Governor in Council may make regulations designating, as an ecological reserve, any provincial land that sustains or is associated with unique or representative parts of the natural environment ...
3-2	Ecological reserves not to be transferred, assigned, etc. ... no ecological reserve, and no right, title, interest or estate in an ecological reserve, shall be granted, assigned, or otherwise disposed of pursuant to any other Act or law.
3-3	Entry or activity re ecological reserves The Lieutenant Governor in Council may make regulations: (a) prescribing the circumstances and conditions under which an ecological reserve may be entered ... (c) respecting the activities that may be conducted on an ecological reserve ...
4-6	Damage prevention and repair order (1) An officer may make an order requiring any person to stop any activity on provincial land if the officer believes ... that the person has done or is doing anything to alter provincial land in a manner contrary to this Act, the regulations or the terms and conditions of a disposition.

Table 16. (complete) Examples of specific legislative sections describing protection and conservation measures of habitat (land) in *The Provincial Lands Act, 2016*.

<i>The Provincial Lands Act, 2016</i>	
Section	Description
4-7	Minister's order (2) ... the minister may make an order requiring a person to do all or any of the following: (a) to cease or suspend the doing of an act or cease failing or neglecting to do an act; (b) to comply with this Act, the regulations or the terms and conditions of a disposition; (c) to do or refrain from doing any other thing that the minister considers necessary. 3) ... the minister may require a person who is the subject of the order to do all or any of the following: (a) to lessen or prevent further damage to provincial land specified in the order; (b) to remedy the damage to provincial land specified in the order; (c) to restore the provincial land specified in the order to a condition satisfactory to the minister; ... (f) to cease or suspend any activity for a period specified in the order or permanently ... 4) The minister's order may specify: (a) the method or procedures to be used in carrying out the measures required by the order ... and (b) the period within which any measure required by the order is to be commenced ...
7-1	Offences (1) No person shall: ... (e) abandon property on provincial land; (f) make any alteration to provincial land without a disposition, authorization or a minister's written consent; ... (h) enter or conduct an activity on an ecological reserve contrary to this Act, the regulations or a permit issued pursuant to the regulations; ... (3) Every person who contravenes any provision of this Act or the regulations is guilty of an offence and liable on summary conviction: (a) for a first offence: (i) in the case of an individual, to a fine of not more than \$100,000; and (ii) in the case of a corporation, to a fine of not more than \$500,000; and (b) for a second or subsequent offence: (i) in the case of an individual, to a fine of not more than \$100,000 for each day or part of a day during which the offence continues; and (ii) in the case of a corporation, to a fine of not more than \$500,000 for each day or part of a day during which the offence continues.
9-1	Regulations The Lieutenant Governor in Council may make regulations: ... (d) prescribing the conditions that a plan respecting the long-term use of provincial land must satisfy ... (n) establishing an ecological reserve or enlarging any ecological reserve ...
10-5	Ecological reserves continued ... Crown land designated as an ecological reserve in accordance with <i>The Ecological Reserves Act</i> on the day before section 1-1 of this Act comes into force is continued as an ecological reserve and: (a) may be dealt with as if it were designated as an ecological reserve pursuant to this Act; and (b) any conditions or restrictions placed on the activities that may be conducted on the ecological reserve are deemed to have been made in accordance with this Act.

Table 17. Examples of specific legislative sections describing protection and conservation measures of species in *The Wildlife Act, 1998*.

<i>The Wildlife Act, 1998</i>	
Section	Description
2	Interpretation ... “wild species at risk” means any native wild species that have been designated and listed by the Lieutenant Governor in Council...
9	Agreements Subject to the regulations, the minister may enter into an agreement with any person, Indian band or government for any of the following purposes: (a) protecting, managing, conserving, reintroducing or encouraging the propagation of wildlife and wild species and protecting, managing and conserving their habitats; (b) establishing and promoting programs respecting public safety, education about wildlife or wild species or other conservation-oriented programs ...
17	Amendment, suspension, or cancellation of licence (2) The minister may amend, suspend, or cancel a licence or cancel a person’s licence and prohibit that person from applying for or obtaining a licence where, in the opinion of the minister: ... (b) the person has contravened any provision respecting firearms, hunting or the protection of wildlife or wild species at risk of any other Act, Act of the Parliament of Canada or regulation made pursuant to any other Act or Act of the Parliament of Canada; (c) it is necessary for the protection of wildlife or wild species at risk; or (d) it is in the public interest to do so.
21	Licence Required (2) ... no person shall conduct surveys, research or other activity to detect or observe any species, wild species or wild species at risk, or assess the habitat of any species, wild species or wild species at risk, for a commercial, scientific, academic, or other purpose prescribed in the regulations without a licence issued by the director.
45	Protection of Wild Species at Risk Interpretation of Part ... “designated species” means any extirpated, endangered or threatened native wild species designated and listed in the regulations ...
48	Minister determines wild species to be at risk 41) The minister may determine any of the following: (a) whether or not a wild species is to be classified as extirpated, endangered, threatened or vulnerable; (b) whether or not a wild species at risk is to be reclassified or is to be deleted from the list mentioned in section 49; (c) whether or not a wild species is to be added to the list ...
49	Designation and listing of wild species (1) Where the minister determines that a wild species is to be classified as extirpated, endangered, threatened or vulnerable, the Lieutenant Governor in Council may, by regulation, designate and list the wild species as: (a) extirpated; (b) endangered; (c) threatened; or (d) vulnerable.

Table 17. (continued) Examples of specific legislative sections describing protection and conservation measures of species in *The Wildlife Act, 1998*.

<i>The Wildlife Act, 1998</i>	
Section	Description
50	Recovery plans (1) Subject to the regulations, the minister may prepare and implement a recovery plan to protect each designated species. (2) A recovery plan may identify any of the following: (a) the needs of and threats to any designated species or its habitat; (b) the viable status needed for recovery of any designated species; (c) the options for the recovery of any designated species; (d) the costs and benefits of the options mentioned in clause (c); (e) a course of action or a combination of actions for the recovery of any designated species. (3) A recovery plan may include provisions respecting: (a) one or more designated species; and (b) ecosystem management. (4) The minister may determine the priority with which any recovery plan or any portion of a recovery plan will be implemented. (5) The factors that the minister may take into consideration when determining the priority to be assigned to a recovery plan or any portion of a recovery plan include: (a) whether scientific evidence indicates that the designated species mentioned in the recovery plan is naturally becoming extirpated; (b) whether it is technically or economically feasible to recover the designated species; and (c) the status of the designated species elsewhere. (6) The minister may, to the extent possible, prepare a recovery plan in co-operation with other jurisdictions where the designated species is also found.
51	Activity prohibited (1) ... no person shall do any of the following: (a) kill, injure, possess, disturb, take, capture, harvest, genetically manipulate or interfere with or attempt to do any of those things to any designated species; (b) export or cause to be exported from Saskatchewan any designated species; (c) traffic in any designated species.
74	Offences and penalties – Part IV (1) Any person who contravenes a provision of Part IV or the regulations with respect to wildlife for which no monetary penalty is specified is guilty of an offence and liable on summary conviction to a fine of not more than \$100,000.
75	Offences and penalties – Part V 75(1) Any person who contravenes any provision of Part V or the regulations with respect to wild species at risk for which no monetary penalty is specified is guilty of an offence and liable on summary conviction: (a) in the case of an individual: (i) for a first offence, to a fine of not more than \$5,000; and (ii) for a second or subsequent offence, to a fine of not more than \$10,000; (b) in the case of a corporation: (i) for a first offence, to a fine of not more than \$20,000; and (ii) for a second or subsequent offence, to a fine of not more than \$50,000.

Table 17. (complete) Examples of specific legislative sections describing protection and conservation measures of species in *The Wildlife Act, 1998*.

<i>The Wildlife Act, 1998</i>	
Section	Description
83	Regulations (1) The Lieutenant Governor in Council may make regulations: ... (b) constituting any area of the province as an area for protecting, propagating, perpetuating, managing, harvesting, controlling or regulating wildlife or wild species at risk or protecting, controlling or managing habitat; (c) respecting the management, control and protection of any of the areas constituted in accordance with clause (b) and the wildlife, wild species at risk or habitat in those areas, and regulating hunters, trappers and other persons in those areas; (d) respecting the protection, management, regulation and use of any wildlife, wild species at risk or habitat; ... (viii) the delivery of any wildlife or wild species at risk taken for the purposes of management or research of wildlife or wild species at risk; (kk) respecting programs of land use as to the preservation, maintenance and restoration of habitat and public access to land; (ll) respecting co-operative programs to maintain the habitat of wildlife or wild species at risk and public access to land; (pp) respecting the designation and listing of wild species at risk, including the establishment, maintenance, amendment and distribution of the list; (qq) respecting programs to prepare status reports with respect to wild species at risk and to prepare and implement recovery plans; (rr) respecting emergency provisions to designate and list wild species at risk and protect their habitats; (ss) respecting the monitoring, assessment and reporting of the status of wild species at risk;

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