

# ASPEN PARKLAND (#156)

The Aspen Parkland ecoregion is a broad transition zone between the Prairies and Boreal Plains ecozones in the east and north, and it marks the transition from grasslands to mountains in the west. This ecoregion represents the most extensive boreal-grassland transition in the world. It is characterized by a rich mosaic of grasslands, aspen groves and wetlands. This ecoregion provides habitat for over 45 species at risk and includes some of the most productive and extensive waterfowl breeding habitat on the continent. Almost 80% of the natural cover has been converted to cropland and other land uses. Only 4% is included in conserved/protected areas and of this 0.7%, is designated as community pasture.

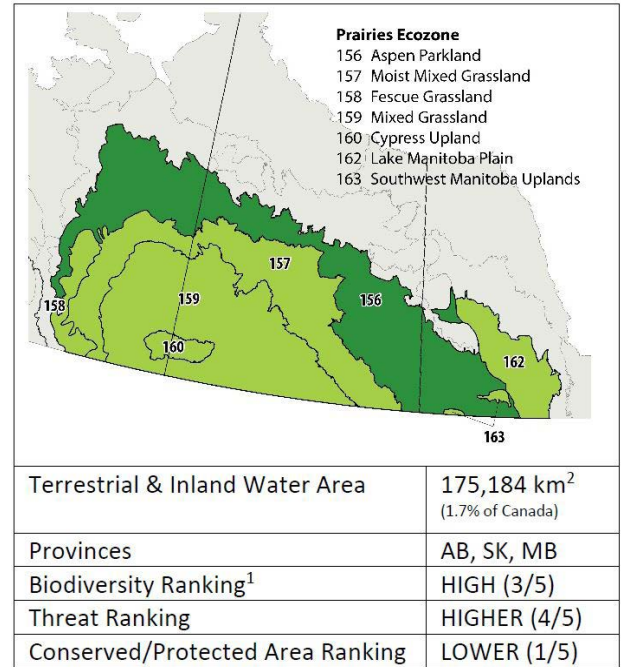
## LOCATION

The ecoregion extends a broad arc from southwestern Manitoba, northwestward through Saskatchewan to its northern apex in central Alberta, along the Rocky Mountains. A small portion of the ecoregion extends from Manitoba into North Dakota.

## CLIMATE/GEOLOGY

The ecoregion is marked by short, cool to warm summers and long, cold winters. The mean annual temperature is approximately 1.5°C. The mean summer temperature is approximately 15°C and the mean winter temperature is approximately -12.5°C. The mean annual precipitation ranges from 400 to 500 millimetres, with most precipitation falling between May and September. The climate is generally cooler and drier in the northwest, with warmer and wetter conditions in southwestern Manitoba.

The Aspen Parkland is characterized by rolling topography with deep rich soils that are the most productive agricultural lands in Canada's prairies. This landscape is pocketed with many shallow depressions with small lakes, ponds and prairie sloughs.



## VEGETATION

The Aspen Parkland is situated between the prairies and boreal, and marks the transition from grasslands and, in the west, to mountains. At the northern edges of this ecoregion, aspen forests are more continuous. In the south, drier portions of aspen groves are restricted to shallow depressions that hold moisture, and on north-facing slopes, with grasslands on south-facing slopes and hilltops.

Historically, the landscape was characterized by a rich mosaic of grasslands, woodlands and wetlands. Open stands of trembling aspen (*Populus tremuloides*) with balsam poplar (*Populus balsamifera*) and tall shrub thickets, including beaked hazelnut (*Corylus cornuta*), snowberry (*Symphoricarpos albus*), Bebb's willow (beaked willow) (*Salix bebbiana*) and fire cherry (pin cherry) (*Prunus pensylvanica*) occur on moist sites. Groves of jack pine (*Pinus banksiana*) occur in the north, and bur oak can be found in the southeast. Grasslands in this ecoregion are dominated by rough fescue (plains rough fescue) (*Festuca hallii*), western porcupine grass (*Hesperostipa curtisetata*), Montana wild rye (northern wheatgrass) (*Elymus albicans*), slender wild rye/wheatgrass (*Elymus trachycaulus*) and prairie junegrass (*Koeleria macrantha*). Common wildflowers include yarrow (*Achillea millefolium*), American pasqueflower (prairie crocus) (*Pulsatilla patens*) and a variety of asters. Woodlands dominated by trembling aspen, with white spruce (*Picea glauca*) and balsam fir (*Abies balsamea*), can develop on moist grassland sites in the absence of disturbances.

Historically, fire played an important role in maintaining the grasslands and

<sup>1</sup> Ranking categories for biodiversity threat and conserved/protected area are relative to other ecoregions in the southern Canada study area (5=highest, 4=higher, 3=high, 2=low, 1=lower, 0=lowest). The lowest score for conserved/protected area is 1. For biodiversity and threat, the highest category based on measures and criteria approach is used.



## FRESH WATER AND COASTS

The ecoregion is dominated by the Nelson River drainage (Hudson Bay basin). Major rivers include Central and Lower North Saskatchewan, Lower South Saskatchewan, Battle, Bow, Assiniboine, Qu'Appelle, Red Deer and Souris (Figure 1).

The ecoregion has a very high concentration of small wetlands, lakes, ponds and sloughs. There are also several saline lakes, such as Redberry Lake in Saskatchewan. The largest lakes are Big Quill and Little Quill lakes. Wetlands and water cover approximately 6.4% of the ecoregion, although this is likely an under-estimate as many of the smaller potholes would not be included in this figure.

## AT-RISK VEGETATION COMMUNITIES

Rare vegetation communities have not been well documented from this ecoregion. Associations that are of potential global conservation concern include:

- paper birch/beaked hazel woodland

## WILDLIFE

The diversity and mosaics of different habitat types in this ecoregion result in a high richness of mammals and breeding birds. Common wildlife species include white-tailed deer (*Odocoileus virginianus*), coyote (*Canis latrans*), snowshoe hare (*Lepus americanus*), cottontail (*Sylvilagus floridanus*), red fox (*Vulpes vulpes*), northern pocket gopher (*Thomomys talpoide*) and Richardson's ground squirrel (*Urocitellus richardsonii*). Common birds include western kingbird (*Tyrannus verticalis*) and yellow warbler (*Setophaga petechia*). This ecoregion also provides important nesting habitat for waterfowl. Grizzly bear (*Ursus arctos horribilis*) occurs in the western part of this ecoregion along the interface with the Rocky Mountains.



Photo by Don Dabbs

## AT-RISK PLANTS AND ANIMALS

The Aspen Parkland ecoregion has a very high richness of species of conservation concern. There are over 45 national species at risk in the ecoregion. In addition, there are 10 species of global conservation concern (Figure 2). Many of these occur in the eastern portion of the ecoregion. Species at risk include:

- burrowing owl (*Athene cunicularia*)
- western grebe (*Aechmophorus occidentalis*)
- silky prairie clover (*Dalea villosa* var. *villosa*)
- Sprague's pipit (*Charadrius melodus circumcinctus*)\*
- piping plover (*Charadrius melodus circumcinctus*)\*
- mottled duskywing (*Erynnis martialis*)\*

\*nationally and globally at risk (NatureServe)



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Photo by Kyle Marquardt

## LAND USE

The Aspen Parkland is characterized by farmland, towns and large urban centres (Figure 3). It includes some of the most productive agricultural land in Canada and produces a wide variety of crops, including canola, alfalfa and wheat. Cultivation of land for pasture is also widespread. In addition to agriculture conversion, oil and gas exploration and drilling have disturbed and fragmented many areas with natural habitats.

The rate of land conversion (2000-2010) in this ecoregion is one of the highest in southern Canada. This is primarily native grasslands being converted to cropland. Within some parts of the ecoregion, the annual rate of deforestation was almost 1% in the 1990s, exceeding that of many tropical countries.

Major urban centres include Red Deer, Edmonton, Lloydminster, North Battleford, Humboldt, Yorkton and Brandon. The total population is 2,496,162 (2016), with a growth of over 47.5% in the last 20 years.

## CONSERVATION CONCERNS

Compared to the rest of southern Canada, this ecoregion has experienced historic and recent rates of conversion of natural habitats to agriculture that are among the highest in Canada. Remaining habitat patches are generally small and highly fragmented.

High-ranking threats identified from Nature Conservancy of Canada's (NCC) Natural Area Conservation Plans (NACPs) in this ecoregion include invasive terrestrial species, urban and residential development, dune stabilization, incompatible fire management/altering fire regimes, climate change (decreasing snow pack and precipitation), wetland drainage and alteration, conversion of natural habitats, oil and gas development, and woody species encroachment. These threats may not be relevant to all areas of the ecoregion.

Populations of grassland birds and shorebirds that breed in this ecoregion have been rapidly declining.

## CURRENT CONSERVATION STATUS

The Aspen Parkland is the most altered ecozone in the Prairies, and one of the most impacted in all of Canada. It is also one of the most critically endangered forest regions in the western hemisphere (Ferrer-Paris et. al 2019). Only 21.2% natural cover remains here and there are few large intact blocks of natural habitat remaining. Much of the natural vegetation occurs on marginal soils that are less suitable for agriculture. There is limited opportunity for large-scale connectivity across the ecoregion (Figure 4).

Only 4% of the ecoregion is in conserved/protected areas (Figure 5). The largest protected areas include provincial and national parks, and federal and provincial pasturelands (0.7% of the conserved/protected areas is community pasture). The diversity of landform features in this ecoregion is poorly represented in the current system of protected areas.

Conservation designations in this ecoregion include two Ramsar Wetlands of International Importance (Beaverhill Lake and Quill Lakes) and two World Biosphere Reserves (Redberry Lake and Riding Mountain).

This ecoregion also has a very large number and high coverage of Key Biodiversity Areas that protect important shorebird, waterbird and waterfowl habitats. These include Basin and Middle lakes, Bearhills Lake, Beaverhill Lake, Bellshill Lake, Big Lake, Blaine Lakes, Douglas Marsh, Lake Lenore, Manitou Lake, Metiskow and Sunken lakes, Ministik, Joseph and Oliver lakes, Miquelon Lake, Oak Lake/Plum Lakes Area, Ponass Lake, Quill Lakes, Radisson Lake, Redberry Lake, Shultz Lake, Sounding Lake, St. Lawrence Lake, Wavy Lake, Whitewater Lake, Whitford and Rush Lakes.

NCC is very active in the Aspen Parkland with 14 NACPs<sup>2</sup> covering 44.7% of the ecoregion. Larger NACPs in the ecoregion include Assiniboine Delta, Bow, Cooking Lake Moraine, East Parklands, Moose Mountain, Oak Sandhills and Wetlands, Red Deer River, Souris River Valley Grassland, West Parklands and West Souris Mixed-Grass Prairie. Key properties include Bunchberry Meadows, Maymont, Pasqua Lake, Edenwold, Upper Whitesand 02 and Ivey.

Ducks Unlimited Canada is very active in this ecoregion and has, for example, conserved properties at Quill Lakes and Bearhills Lake, and with many private landowners.

<sup>2</sup> NACPs that cover >5% of the ecoregion as of December 31, 2017.

## POTENTIAL CONSERVATION STRATEGIES

Of all the prairie ecoregions in Canada, the Aspen Parkland is the most altered. Outside of protected areas, there are very few opportunities to protect new, large areas of intact habitat. Much of the land is privately owned, with few areas of federal and provincial pastureland. In addition, the productive agricultural soils and proximity to rapidly growing urban areas result in high land values, which may limit private land conservation. This ecoregion, the world's largest ecological transition zone between grassland and boreal forest, maintains some of the most productive waterfowl breeding habitat on the continent, and much of the responsibility to protect both lies with Canadians. Even with the high degree of land conversion, important areas can still be protected to maintain Canada's biodiversity, including opportunities to create, expand and connect conserved/protected lands. Protecting these areas will require partnerships with the agricultural community and cities.

Potential conservation strategies for this ecoregion include:

1. Maintain the cover of parklands, grasslands and wetlands to at least 20% (currently approximately 21%) over the next 10 years, with a focus on wetland habitats.
2. Increase the amount of conserved lands to 5% in the next 10 years (including longer term and more secure status for community pastures). This will require the conservation of an additional 1,700 square kilometres. Focus on maintaining connectivity to the three major biomes surrounding the ecoregion (prairie grasslands, boreal, mountains), protecting key areas and building on and connecting existing protected areas. There are several protected areas with opportunities to conserve adjacent lands that would enhance buffers and connectivity. These include Elk Island National Park (Cooking Lake Moraine) and Moose Mountain Provincial Park. There also may be opportunities for large-scale conservation in the eastern Alberta portion of this ecoregion.
3. Despite the low amount of natural cover, this region has a very high number of species that are at risk in Canada. In particular, NCC's West Souris Mixed-Grass Prairie and Oak Lake Sandhills and Wetlands Natural Areas in the southeastern portion of the Aspen Parkland ecoregion have a very high richness of species at risk, including species not found elsewhere in Canada, and should be a priority for species-at-risk recovery actions.
4. Develop long-term partnerships and incentives to manage invasive species and ecological succession by reducing encroachment of aspen into grasslands.
5. Explore opportunities to improve baseline biodiversity information, including more consistency in the tracking and mapping of species of conservation concern and the identification of at-risk vegetation communities.



Photo by Brent Calver

## LARGEST CONSERVED AREAS

(TOP 10, BY SIZE)

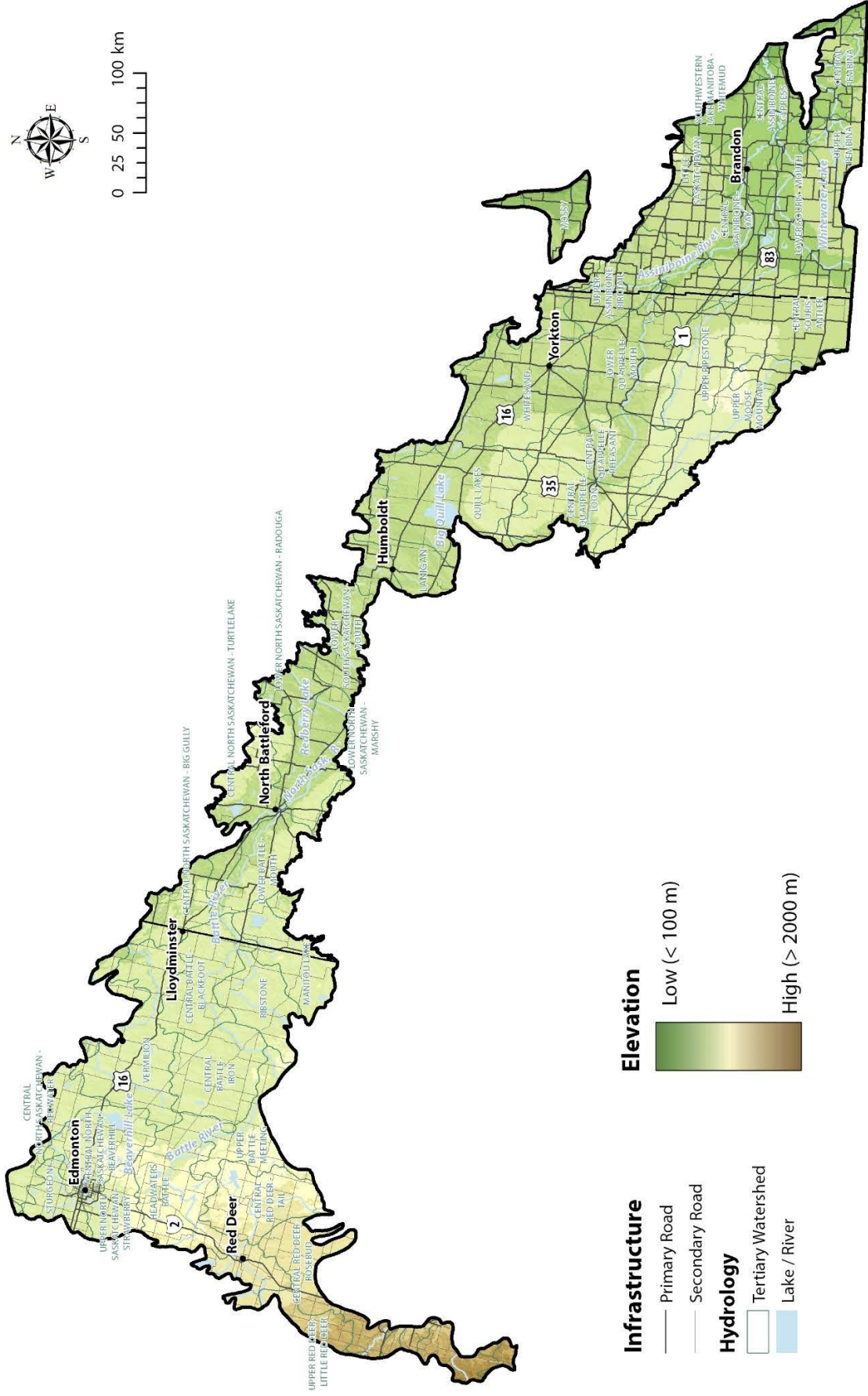
1. Moose Mountain Provincial Park  
(40,265 hectares/99,497 acres)
2. Pekisko Heritage Rangeland  
(34,355 hectare/84,893 acres)
3. Spruce Woods Provincial Park  
(20,440 hectares/50,508 acres)
4. Elk Island National Park of Canada  
(19,400 hectares/47,938 acres)
5. Beaverhill Lake Heritage  
Rangeland Natural Area  
(17,534 hectares/43,327 acres)
6. Spy Hill-Ellice Community Pasture  
(15,815 hectares/39,080 acres)
7. Battle River-Cutknife  
Community Pasture  
(12,592 hectares/31,116 acres)
8. Paynton Community Pasture  
(10,192 hectares/25,185 acres)
9. Ituna Bon Accord Community Pasture  
(9,991 hectares/24,688 acres)
10. Cooking Lake-Blackfoot  
Provincial Recreation Area  
(9,701 hectares/23,972 acres)

To learn more about this ecoregion  
and NCC's conservation assessment  
for southern Canada, visit  
[natureconservancy.ca/casc](https://natureconservancy.ca/casc).

## KEY REFERENCES

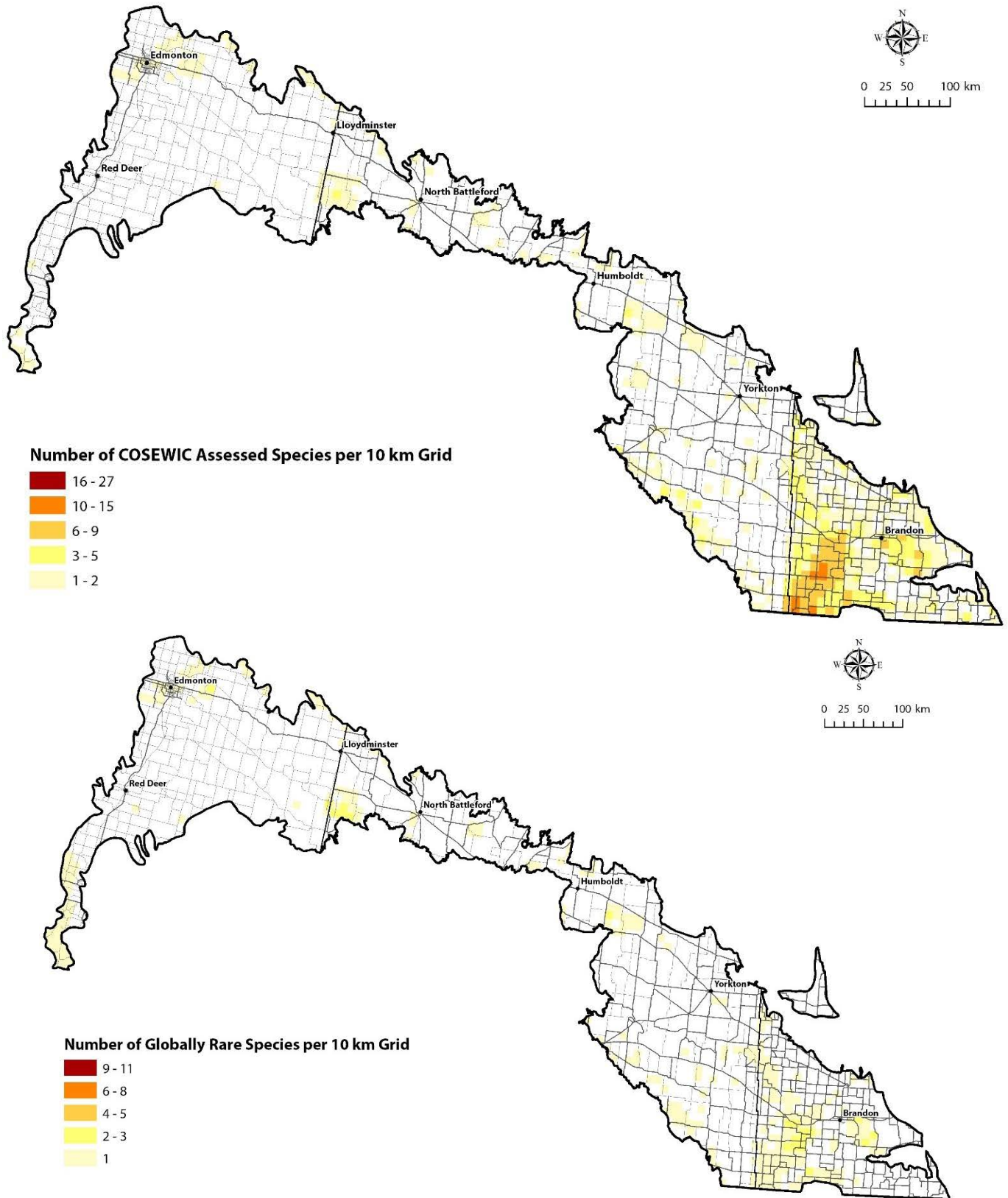
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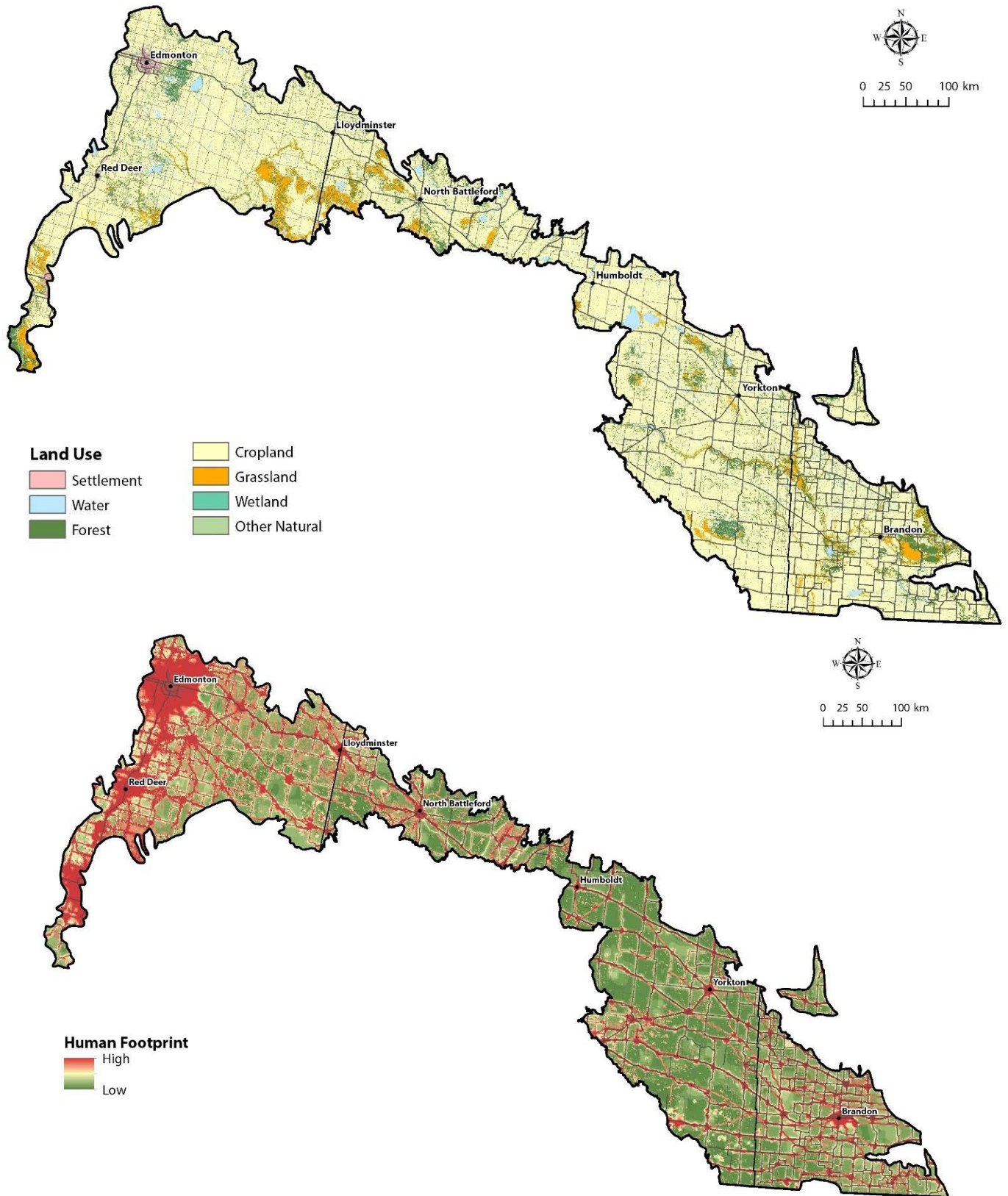
**Figure 1: Context of the Ecoregion.** This map shows towns, roads, elevation, rivers, lakes and watersheds.

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**Figure 2: Species of Conservation Concern (COSEWIC and global).** These maps show the number of different Committee on the Status of Endangered Wildlife in Canada (COSEWIC)-assessed and globally rare species. The information is current to 2015. Some areas of the ecoregion may be data deficient and higher numbers of species of conservation concern may occur. There are differences in which COSEWIC-assessed species are tracked, which result in a disparity between the provinces.

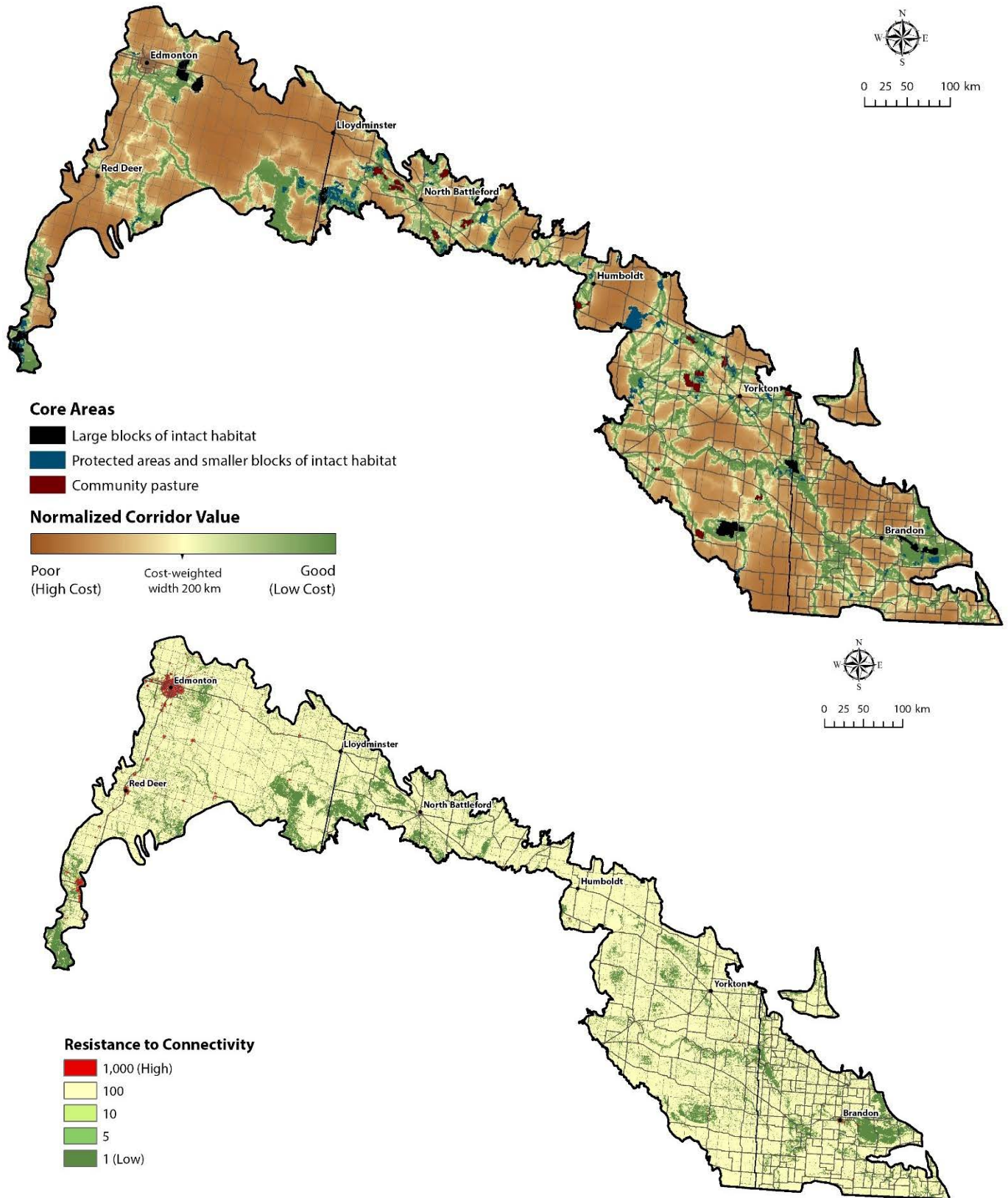
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**Figure 3: Land Use & Human Footprint.** These maps show the dominant land uses and the human influence on the landscape. Although agriculture dominates this ecoregion, there are large areas that still contain native grasslands. Human footprint is highest in urban areas, around major roads and on lands that have been converted to croplands. The human footprint map does not show some stresses that may occur, such as invasive species.

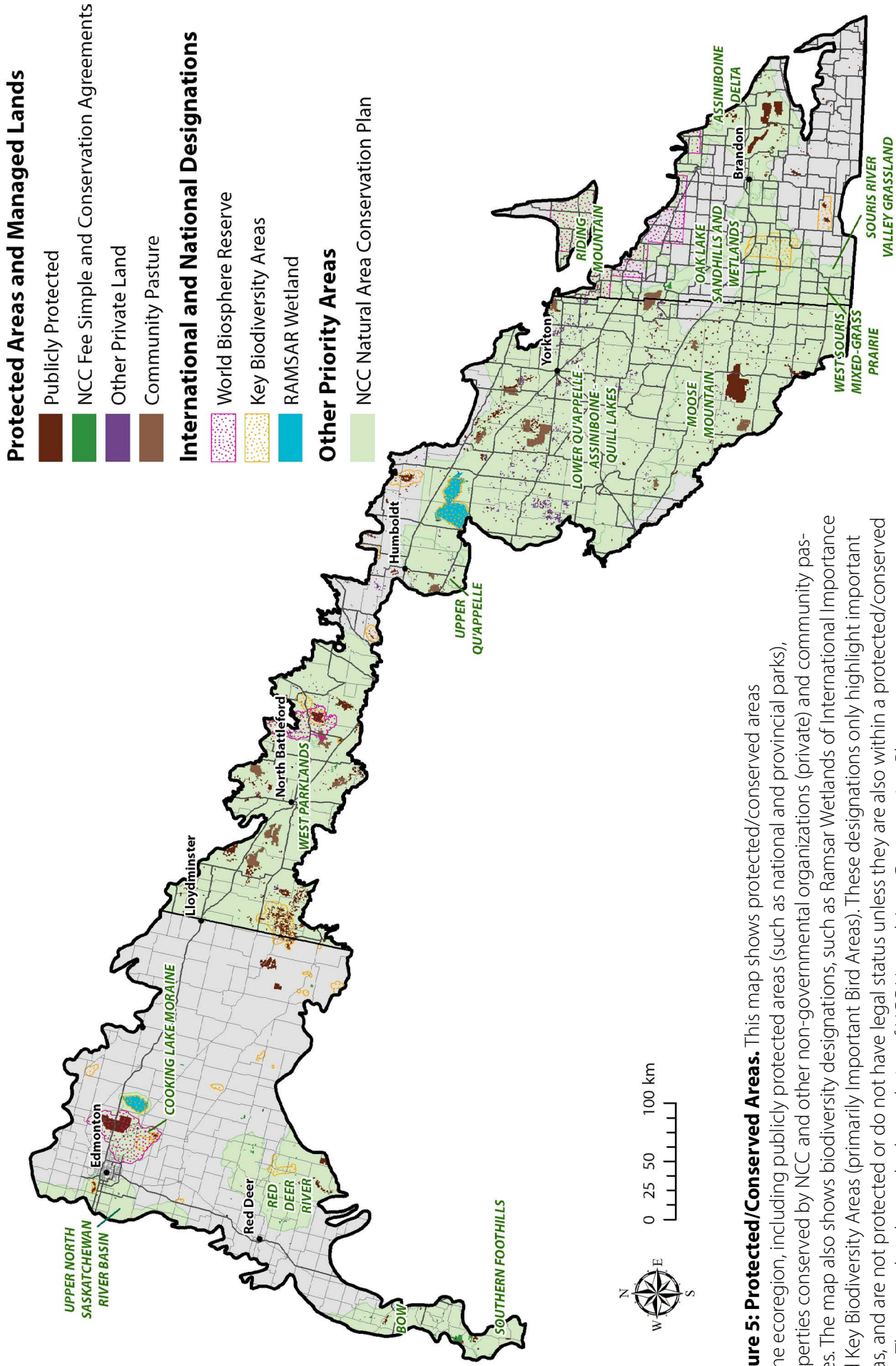


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**Figure 4: Connectivity.** These maps show connectivity between protected/conserved areas, community pastures and large blocks of intact habitat. The bottom map depicts those regions (green) that have a higher probability of being connected within the ecoregion.

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**Figure 5: Protected/Conserved Areas.** This map shows protected/conserved areas in the ecoregion, including publicly protected areas (such as national and provincial parks), properties conserved by NCC and other non-governmental organizations (private) and community pastures. The map also shows biodiversity designations, such as Ramsar Wetlands of International Importance and Key Biodiversity Areas (primarily Important Bird Areas). These designations only highlight important areas, and are not protected or do not have legal status unless they are also within a protected/conserved area. The map also shows the boundaries of NCC Natural Area Conservation Plans.

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**Table 1: Change in Land Use, 2000-2010**

Land Use Class	Code	Change To 2010 (km <sup>2</sup> )																		Total (From)	Per cent (%) of Total Change
		11	21	25	31	41	42	45	46	51	61	62	71	73	74	91					
Unclassified	11	0	0	0	0	0.0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0		
Settlement	21	0	145.4	7.7	23.4	0.2	5.6	0.4	178.4	10.2	0.0	1.8	0.5	0.6	0.7	374.9	4.1				
Roads	25	0.0	163.2	31.9	69.4	0.5	10.5	0.9	943.9	33.5	0.0	5.9	1.6	2.6	1.5	1,265.3	13.7				
Water	31	0	8.1	33.3	158.9	3.2	30.5	7.4	763.2	24.0	0	55.8	6.5	15.7	1.2	1,107.8	12.0				
Forest	41	0	46.0	73.0	132.6	13.4	4.8	9.6	830.2	136.8	0.1	25.9	17.4	9.0	1.3	1,300.1	14.1				
Forest Wetland	42	0	0.3	0.6	3.3	14.1	1.2	0.6	24.6	0.7	0.0	2.0	4.1	0.7	0.0	52.1	0.6				
Trees	45	0	9.8	14.3	25.3	0.1	1.3	2.7	186.5	16.6	0.0	7.9	2.0	1.8	0.2	268.6	2.9				
Treed Wetland	46	0	0.5	1.1	5.7	9.2	0.6	2.4	24.5	0.6	0	2.6	1.9	0.6	0.0	49.7	0.5				
Cropland	51	0	258.5	974.1	792.5	703.4	5.9	179.3	21.2	85.8	0.0	101.5	20.1	33.6	4.8	3,180.6	34.6				
Grassland Managed	61	0	19.2	42.5	30.8	141.4	1.0	17.8	0.7	939.5	0.0	8.5	3.8	0.6	2.4	1,208.2	13.1				
Grassland Unmanaged	62	0	0.0	0.0	0	0.1	0.0	0.0	0.0	0.0	0	0	0.0	0.0	0.0	0	9				
Wetland	71	0	3.0	5.7	51.1	29.5	2.2	8.9	3.3	108.1	7.9	0	7.5	4.1	0.5	231.7	2.5				
Wetland Shrub	73	0	0.8	2.0	7.0	19.4	8.2	2.1	4.3	20.1	3.2	7.5	3.1	0.1	0.1	77.7	0.8				
Wetland Herb	74	0	0.7	2.2	18.2	9.1	0.8	2.1	0.7	32.1	0.5	4.2	3.5	0.0	0.0	74.1	0.8				
Other	91	0	2.0	1.4	1.5	1.5	0.2	0.0	4.7	2.1	0.0	0.6	0.1	0.0	0.0	14.0	0.2				
<b>Total (To)</b>		0.0	512.1	1,295.6	1,107.5	1,179.4	37.1	265.3	51.7	4,055.7	321.8	0.1	224.2	69.0	72.5	9,204.6					
Net Change (To-From)		0	137.2	30.4	-0.3	-2,479	-15.1	-3.2	2.1	875.1	-886.4	0.1	-7.5	-8.7	-1.6	-1.3					
Per cent (%) of Total Change		0.0	5.6	14.1	12.0	12.8	0.4	2.9	0.6	44.1	3.5	0.0	2.4	0.7	0.8	0.1					
Net Gain/Loss %		0	1.5	0.3	-0.0	-1.3	-0.2	-0.0	0.02	9.5	-9.63	0.00	-0.1	-0.1	-0.02	-0.01					

\* Diagonal represents unchanged land use