Manitoba's Blue Mosaic

SIX AQUATIC STRONGHOLDS OF MANITOBA'S BOREAL FOREST




BOREAL SONGBIRD INITIATIVE
Keep the Forest Singing

Ducks Unlimited Canada
Conserving Canada's Wetlands

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ABOUT THE BOREAL SONGBIRD INITIATIVE

The Boreal Songbird Initiative (BSI) is a non-profit organization dedicated to outreach and education about the importance of the boreal forest region to North America's birds, other wildlife, and the global environment.

ABOUT DUCKS UNLIMITED CANADA

Ducks Unlimited Canada (DUC) is the leader in wetland conservation. A registered charity, DUC partners with government, industry, non-profit organizations and landowners to conserve wetlands that are critical to waterfowl, wildlife and the environment.

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INTRODUCTION

Manitoba is defined in popular perception by prairies—and not without cause. The vast majority of Manitoba's population lives in its southern, prairie-dominated region. The capital city, Winnipeg, was historically a gateway to the Prairie West, the jumping-off point for European explorers and then early settlers heading to Saskatchewan, Alberta, and beyond. Manitoba's official flower is the Prairie Crocus. The provincial government's official symbol is the Bison, an icon of the Great Plains. But Manitoba has another identity—a northern one—that is equally worthy of a place in the Canadian imagination. Beyond the wheat fields and prairie potholes of the province's south, Manitoba is covered under a vast canopy of boreal forest that stretches over more than three-quarters of its land mass (Ducks Unlimited Canada 2010).

The scale of this landscape is daunting: if Manitoba's 570,000 km² (140 million acres) of boreal forest were its own country, it would be larger than many entire nations, including Spain, Sweden, and Japan.

Perhaps most impressive is that more than 80 percent of Manitoba's boreal forest (467,000 km²/115 million acres) remains highly intact and free of industrial development (Global Forest Watch Canada 2009). In fact, Newfoundland and Labrador is the only Canadian province that boasts a higher proportion of undeveloped, primary boreal forest (Global Forest Watch Canada 2009).

As conservation science continues to evolve, there is a growing consensus that intactness (the absence of large-scale human industrial activity and footprint) is, in and of itself, one of the most important conservation values and therefore deserving of protection (IBCSP 2013, Locke 2013, Noss et al. 2012). Because boreal forests tend to be colder, grow more slowly, and feature many species that require large geographic ranges, maintaining these very large intact expanses and corridors that connect them is critically important (Wells et al. 2014, IBCSP 2013, 2011, Slattery et al. 2011, Carlson et al. 2009, Bradshaw et al. 2009, Wiersma and Nudds 2009).

Manitoba is the only Canadian province or territory to prominently feature at least four of the country's seven major boreal ecozones—Boreal Plains, Boreal Shield, Hudson Plains, and Taiga Shield—representing a wide variety of terrain, habitat, and biodiversity (Ecological Stratification Working Group 1995). Throughout all of Manitoba's boreal landscapes, there is one connecting thread: the presence of water.

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The combined surface area of Manitoba's boreal lakes is larger than the country of Austria.

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Waterfowl such as Lesser Scaup thrive in the lush aquatic regions of Manitoba's boreal forest.

WONDROUS WATERWAYS

Canada's boreal forest is the world's largest and most pristine source of unfrozen freshwater on Earth (Wells et al. 2011). Manitoba's boreal region is no exception; approximately half of its boreal forest region is comprised of lakes, rivers, or wetlands (Manitoba Water Council 2010).

More than 8,000 lakes 1 km² (247 acres) or larger can be found in Manitoba's boreal forest (Ducks Unlimited Canada 2014) and, in contrast to Manitoba's Great Lakes toward the south, the majority are pristine and relatively undisturbed by humans. Combined, Manitoba's boreal lakes comprise a total area of at least 83,000 km² (20.5 million acres) (Ducks Unlimited Canada 2014)—equivalent in size to the country of Austria.

Every one of Manitoba's rivers either originates in or eventually drains through the boreal (Environment Canada 2013). Of the four largest rivers that drain into Hudson Bay through Manitoba, two are entirely free-flowing and unaltered (Manitoba Wildlands 2013). These rivers, the Seal and Hayes, are almost entirely untouched by modern-day industrial development. The eastern and northeastern portions of the province (including the rivers on the east side of Lake Winnipeg and the Hudson Bay Lowlands to their north) share with Ontario the distinction of being within one of the single largest intact, undisturbed blocks of forest anywhere in the world (Canadian Boreal Initiative 2009).

The entirety of Manitoba's water flow drains into Hudson Bay, with the majority by volume spilling out of the Seal, Churchill, Nelson, and Hayes Rivers (Dery et al. 2005). These rivers help sustain long-lasting Arctic current cycles and provide Hudson Bay wildlife with critical nutrients originating far upstream (Wells et al. 2011, Stewart and Barber 2010). Protecting these watersheds is not only crucial for Manitoba's long-term ecological health, but also that of Hudson Bay and some of Canada's most unique and important Arctic species.

Above: Rare salt-dominated wetlands in Manitoba's Great Lakes Region.

Right: Manitoba's Great Lakes feature some of the lengthiest and most productive inland shoreline wetland systems anywhere in Canada.

WORLD CLASS WETLANDS

Wetlands—saturated expanses of peatland (bogs and fens), marsh, and swamp—dominate Manitoba's boreal region. At more than 200,000 km² (49 million acres), wetlands make up around 40 percent of Manitoba's boreal region (Ducks Unlimited Canada 2010)—one of the largest and most dense network of wetlands within Canada. Freshwater coastal wetlands are widespread throughout significant stretches along the shores of Manitoba's Great Lakes (Lake Winnipeg, Lake Winnipegosis, and Lake Manitoba). River, lakes, ponds, and marshes form an intricate, silvery mosaic across northern Manitoba. And the vast Hudson Bay Lowlands feature some of the deepest, richest, and most carbon-dense peatlands found anywhere on Earth (Abraham and Keddy 2005).

Overall, the Hudson Bay Lowlands comprise the third largest wetland network on Earth and perhaps the one least affected by human development (Abraham and Keddy 2005). The Saskatchewan River Delta is one of the largest inland freshwater deltas in all of North America, covering an area (~10,000 km²/2.5 million acres) nearly twice the size of Prince Edward Island. The Delta's expanses of grassy marshes, shallow lakes, river and stream channels, shrubby river edge habitats, and forested wetlands teem with wildlife (Wells et al. 2013, Smith 2008, Lindgren 2001).

With water shortages and contamination increasing around the globe, Manitoba's vast networks of blue provide ecological insurance for future generations and deserve greater recognition.

Above: Wetlands filter out pollutants and help reduce droughts and flooding.

Below: Small creek eventually draining into Lake Manitoba.

FILTRATION AND FLOOD CONTROL

Wetlands are the world's greatest natural regulators of water flow. During wetter seasons they absorb excess runoff, acting as giant natural sponges that reduce severe flooding (Ducks Unlimited Canada 2006, Pielou 1998). During drier seasons they release stored water, allowing for remarkable stability throughout surrounding water tables (Ducks Unlimited Canada 2006, Pielou 1998).

Wetlands are also some of the world's best pollutant filters. They have been found to retain up to 87 percent of the nitrogen and 95 percent of the phosphorous flowing through them (Ducks Unlimited Canada 2006). Nitrogen and phosphorous are two of the most prominent and ecologically damaging contaminants affecting both surface and groundwater (Schindler and Vallentyne 2008). In this sense, wetlands act as the environment's water purifiers and provide a free, natural service. Canadian boreal wetlands (including peatlands) have been estimated to provide the equivalent of $39 billion in water filtration services annually (Anielski and Wilson 2009).

These services are essential to the long-term ecological viability of Manitoba's Great Lakes. Dangerous algae blooms now afflict Lake Winnipeg, which has been plagued by a loss of wetlands to the south and decades of pollutants originating in agricultural runoff from both Canada and the United States, primarily from the Red and Winnipeg Rivers (Environment Canada and Manitoba Water Stewardship 2011, Schindler and Vallentyne 2008). In 2013, the Global Nature Fund gave the lake—the largest of Manitoba's Great Lakes and a vital economic and recreational source for the province—the ignominious title of Threatened Lake of the Year (Global Nature Fund 2013).

While maintaining healthy boreal wetlands and rivers and intact forest watersheds cannot wholly mitigate the damage being done to Lake Winnipeg by inputs coming from the south, the pristine freshwater from these boreal forest sources are critically important to ensure the future improvement of its condition.

Peatlands store immense quanitites of carbon, helping to keep our planet cool.

CLIMATE KINGS

Due to both the sheer size of boreal forests globally and the remarkable extent of wetlands within them, the world's boreal forests and underlying soils have been found to store more carbon than all of the world's temperate and tropical forests combined (Moen et al. 2014, Carlson et al. 2009, 2010 Bradshaw et al. 2009). Canada's boreal forest region leads the way, storing twice as much carbon per square kilometre as tropical forests (Carlson et al. 2009).

Peatlands especially act as nature's 'climate kings,' sequestering and storing immense densities of carbon for millennia. They are one of the most important preventive regulators of climate change because of how much carbon they sequester and store below ground. However, they are also among the most sensitive to disturbance (Carlson et al. 2009, 2010). When drained, burned, or cut off from surrounding water tables (especially through road building), carbon built up over thousands of years can be released.

Due to the relative intactness of Manitoba's boreal forest and the prominence of peatlands throughout, it is estimated to store a minimum of 19 billion tonnes of carbon (Tarnocai and Lacelle 1996)—equivalent to nearly 1,000 years worth of Manitoba's annual greenhouse gas emissions (Climate Change Connection 2013). If the forest was fully developed and the carbon stored released, it would be equivalent to adding 4.2 billion North American cars to the road for a full year (Carbon Credit Canada 2014).

In addition to the ecological and climatic benefits of protecting Manitoba's boreal forest, there may also be immense future economic benefits. Most carbon offset marketplaces are still in relatively early or pilot phases; however, at current rates the valuation of Manitoba's boreal carbon is estimated to be $117 billion (Peters-Stanley and Yin 2013).

Climate change could alter critical boreal habitat for waterfowl, including Bufflehead.

BOUNTIFUL BIODIVERSITY

Manitoba's abundance of wetlands and small lakes support some of the highest-producing waterfowl regions in Canada's boreal forest.

Manitoba's boreal forest is unique because four major ecozones are represented, making it home to a remarkable abundance and diversity of wildlife. Its relative intactness supports not only a unique combination of animals and plants, but some of the healthiest populations of many of these species anywhere in Canada.

The boreal forest region is especially well-known as North America's Bird Nursery because it supports an incredible number of migratory songbirds, shorebirds, waterfowl, and other species (Wells et al. 2014, Wells and Blancher 2011). In all, between 100 to 300 million birds representing more than 250 species breed within Manitoba's boreal forest. This amounts to more than three-quarters of the bird species that can be found throughout the entire boreal forest region of North America (Wells and Blancher 2011, Blancher and Wells 2005), which stretches across the continent from Alaska to Newfoundland and Labrador. Within one area of Manitoba's boreal region, federally-listed species like Yellow Rail, Olive-sided Flycatcher, Canada Warbler, and Rusty Blackbird can be found alongside special, hard-to-see birds like Yellow-bellied Flycatcher, Connecticut Warbler, Bay-breasted Warbler, and Great Gray Owl. Some birds, like the Boreal Chickadee, Gray Jay, Three-toed Woodpecker, and Spruce Grouse, have adapted to the region's cold winters and spend their entire lives exclusively residing within the boreal (Pielou 1998).

Thanks to its abundance of wetlands and small lakes, Manitoba supports some of the highest-producing regions of waterfowl anywhere in Canada's boreal forest. Manitoba's boreal region accounts for approximately 20 percent of the total breeding-season waterfowl found in Canada's western boreal forest region (Manitoba Implementation Plan Committee 2008). Based on analyses of data collected during the annual waterfowl breeding surveys jointly undertaken by the Canadian Wildlife Service and the U.S. Fish and Wildlife Service, an estimated 1.6 million waterfowl breed in Manitoba's boreal forest region each year. These include some species in long-term decline like scoters and scaup (Slattery et al. 2011, Ducks Unlimited Canada 2010). The impressive concentrations of northern latitude birds and shorebirds throughout the Hudson Bay Lowlands have led areas like Churchill to become famous among birders as places to see numerous birds that are otherwise rare and difficult to find (Chartier 1994). These include Harris's Sparrow, Smith's Longspur, Hudsonian Godwit, Red-necked Phalarope, Arctic Tern, Little Gull, Willow Ptarmigan, and Pine Grosbeak.

Several of Canada's federally-listed bird species find needed refuge in Manitoba's boreal forest, including the Bay-breasted Warbler.

Manitoba's boreal also contains some of the most robust herds of the iconic yet rapidly declining boreal woodland caribou. This extremely sensitive species has lost nearly half of its historic North American range and is at risk of extinction in numerous places throughout the country (IBCSP 2011, Hummel and Ray 2008, Schaefer 2003). A 2012 report by Environment Canada found that only 14 of 51 identified herd ranges within Canada were considered to have a greater than 50 percent chance of being self-sustaining (Environment Canada 2012).

Boreal woodland caribou in Pimachiowin Aki.

In contrast, six of Manitoba's 13 ranges were found to be likely self-sustaining. Eight of those ranges still maintain greater than 65 percent of undisturbed caribou habitat (Environment Canada 2012)—the threshold determined by the latest science to be necessary for most herds to survive over the long term (IBCSP 2011).

A number of other symbolically Canadian large mammals can be found throughout Manitoba's boreal forest (Senecal 1999). These forests and wetlands are estimated to support more than 4,000 gray wolves (International Wolf Center 2014) and more than 30,000 moose (Government of Manitoba 2014c). Although grizzly bears had once disappeared from Manitoba, small numbers have in recent years been documented in the far northern reaches of the province, making Manitoba the only Canadian jurisdiction (excluding the Northwest Territories, Nunavut, and Yukon) where all three species of bear—grizzly, black, and polar—now occur (Rockwell et al. 2009, Parks Canada 2010).

Wanipigow River on the east side of Lake Winnipeg.

Manitoba is deservedly famous for its polar bears. The town of Churchill has earned the nickname "Polar Bear Capital of the World" due to the late fall concentration of polar bears near the town—a wildlife spectacle that is now supporting a thriving tourism market (Brandson 2011). The southern Hudson Bay polar bear populations are particularly special because they are the southernmost populations of polar bears on Earth (Stirling et al. 2004). These bears are also unique in their denning behavior. They are the only polar bears in the world that consistently build dens on land, often digging down into permafrost in peat banks or gravel ridges, sometimes up to 100 kilometres (62 miles) inland from the shores of Hudson Bay (Brandson 2011, Peacock et al. 2010).

In addition to supporting highly robust populations of fish, such as Arctic grayling, northern pike, and lake trout, the major rivers that flow through the boreal and drain into Hudson Bay are also vital in supporting adjacent marine species of Hudson Bay (Stewart and Barber 2010, Rosenberg et al. 2005, Stewart and Lockhart 2005). Migratory brook trout and Arctic char populations move from the marine waters of Hudson Bay and ascend into freshwater rivers to spawn, particularly the Seal, Nelson, Hayes, and Churchill Rivers. Beluga whales congregate at the mouths of these same large freshwater rivers to molt and calve (Stewart and Barber 2010). In fact, more than 50,000 belugas are estimated to come to these river mouths every summer. Harbour seals, ringed seals, and bearded seals rely on the fish that are supported by the flows of freshwater and nutrients from these rivers into Hudson Bay (Stewart and Barber 2010, Stewart and Lockhart 2005). Harbour seals even move up and down some of the rivers, sometimes venturing more than 200 kilometres (124 miles) inland on the Seal River (Baird 2001, Beck et al. 1970).

The abundance of polar bears around Churchill has created a blossoming market for tourism.

BALANCE IN THE BOREAL

Blessed with an abundance of healthy boreal forests and wetlands, there is perhaps no place in the world better positioned to employ forward-thinking, sustainable management strategies for ensuring a prosperous long-term future than Manitoba. Not only does the forest's high percentage of intactness allow the opportunity to plan ahead, but Manitobans have the benefit of learning from the numerous mistakes and rare successes elsewhere in the world to help illuminate a positive path forward towards balancing sustainable development, healthy Aboriginal and northern communities, and conservation.

The Canadian Boreal Forest Conservation Framework provides a forward-thinking model for balancing economic and environmental needs.

Resource development is and should continue to be an important feature of Manitoba's diverse economy. However, there is a clear need to move future projects and development ahead wisely and carefully. One such vision has been embodied in the Canadian Boreal Forest Conservation Framework, a forward-thinking model for how to balance the need for conservation of habitat with opportunities for economic vitality and support of vibrant Aboriginal and northern communities (Boreal Leadership Council 2003). The Framework calls for at least half of boreal lands within Canada to be protected and the remainder to be subject to world-leading, ecosystem-based resource management and state-of-the-art stewardship practices.

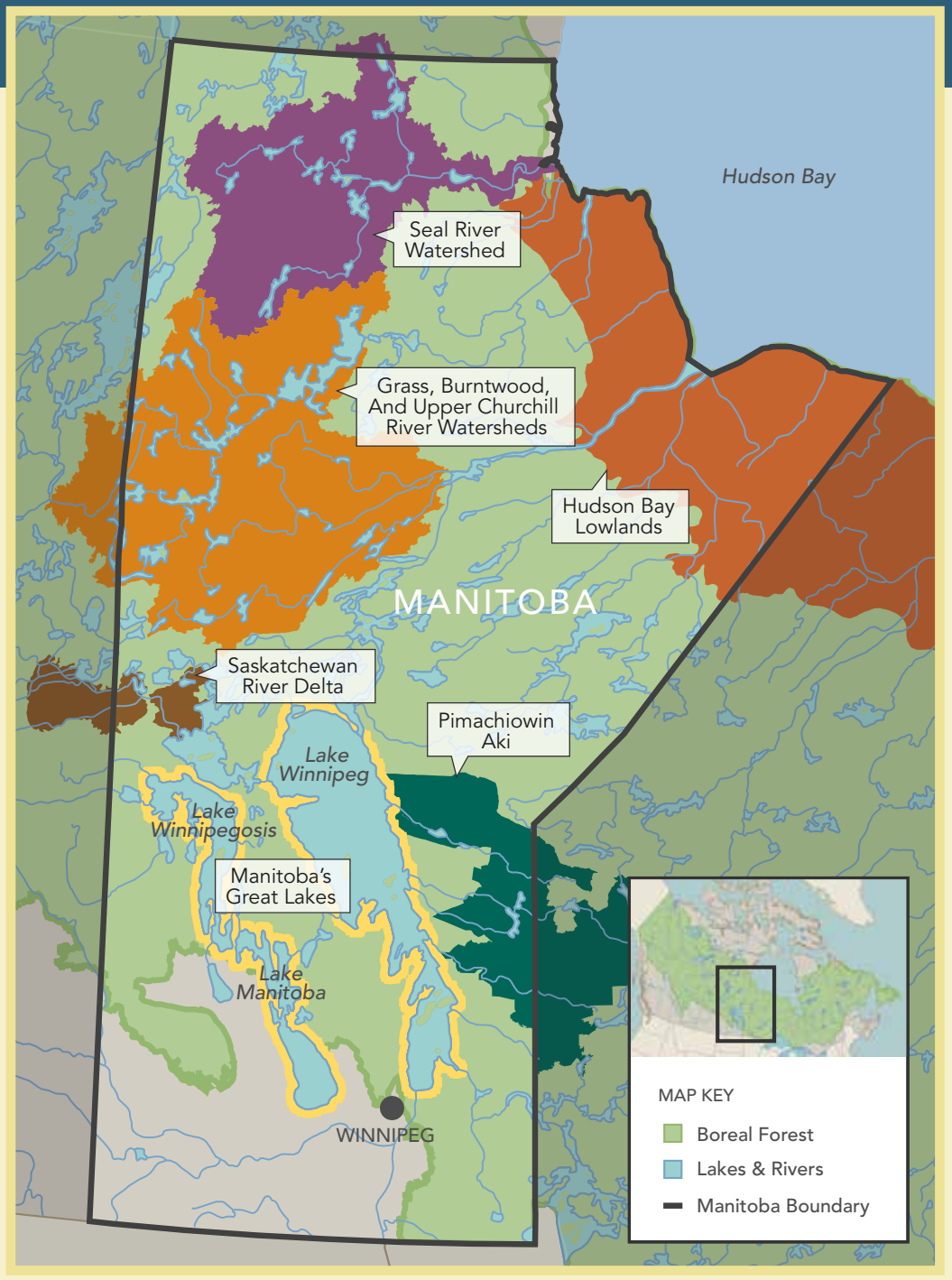
Manitoba has already worked with a number of First Nations to develop land-use plans that conserve large portions of their traditional territories while leaving other portions available for sustainable development (Government of Manitoba 2012, 2013). The province has also partnered with five First Nations and the Government of Ontario to nominate a large swath of boreal forest on the east side of Lake Winnipeg called Pimachiowin Aki as a UNESCO World Heritage Site (Pimachiowin Aki Corporation). These efforts are to be commended and provide a model for similar First Nation-led land-use planning approaches with other interested First Nations throughout the province.

There is also economic benefit to conserving these areas for future generations. For example, a 2008 report by the International Institute for Sustainable Development found that the Pimachiowin Aki region provides at least $121 million worth of goods and ecological services each year, $35 million of which comes from recreational and commercial fishing alone (Voora and Barg 2008).

The Government of Manitoba has already begun to build and implement a framework to help guide development of sustainable management strategies. As part of their TomorrowNow initiative, Manitoba is developing a Boreal Plan to create a roadmap for sustainable development and protection of the boreal, to be developed in partnership with First Nations and others (Government of Manitoba 2014b). The province has recently announced an updated Boreal Woodland Caribou Recovery Strategy that, when implemented, will mandate levels of forest and habitat conservation that will help to ensure caribou thrive on the landscape in Manitoba, in part by requiring that large, intact habitats be exempt from forestry (Manitoba Boreal Woodland Caribou Management Committee 2014). Likewise, the government's work to manage the protection and responsible development of peatlands in Manitoba's boreal forest through the implementation of a Peatlands Stewardship Strategy will help to protect a critical wetland ecosystem upon which waterfowl and other species depend (Government of Manitoba 2014a). The strategy will be anchored with a new Peatlands Stewardship Legislation, a first-of-its-kind law designed to protect and conserve peatlands while regulating their commercial development to ensure recovery.

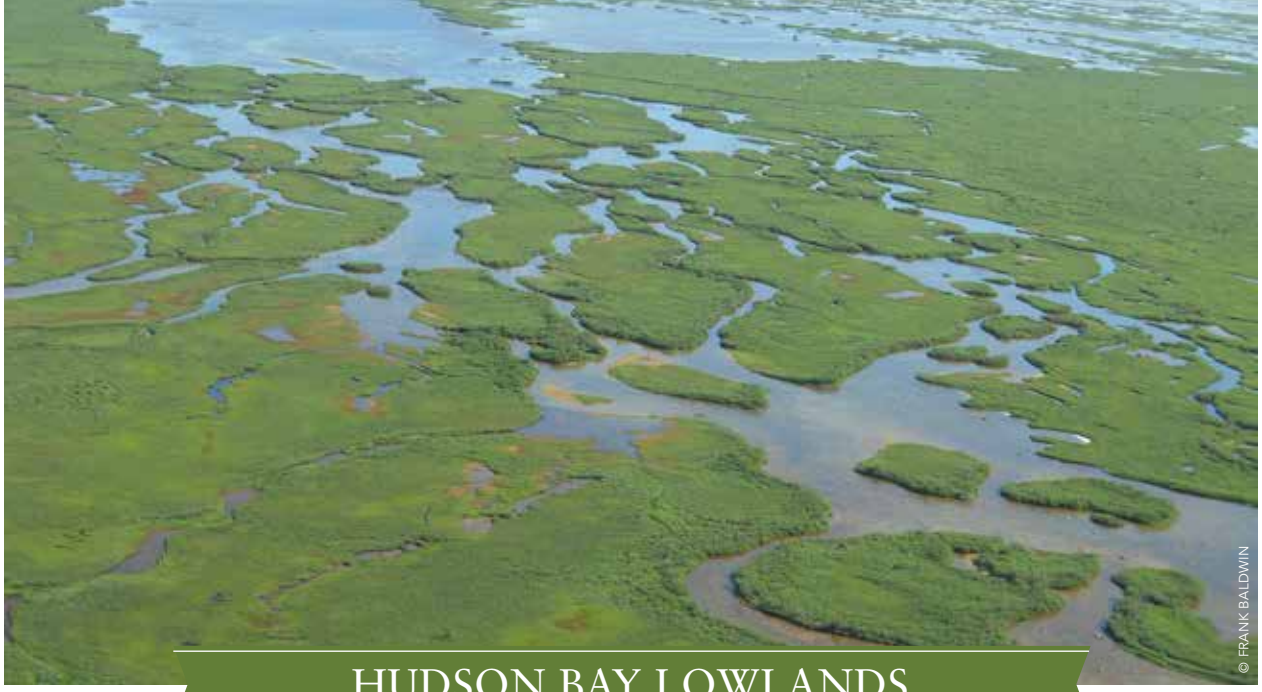
Continuing to develop and implement this kind of forward-thinking, integrated land-use planning is the best way to achieve balance within the boreal forest. This balance is essential to ensuring long-term economic viability throughout the region, while maintaining the vital ecological functions of Manitoba's boreal forests, wetlands, and waterways.

SIX AQUATIC STRONGHOLDS OF MANITOBA'S BOREAL FOREST

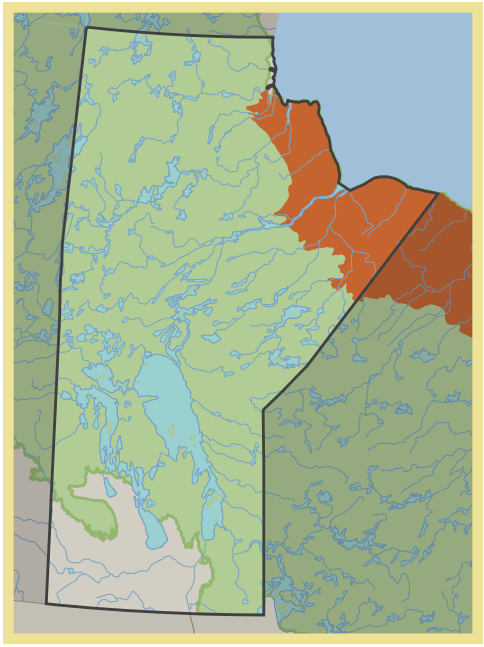


Virtually every corner of Manitoba's vast boreal forest contains some form of unique biodiversity, aquatic features, or other notable conservation values worthy of attention. In the following section we highlight six outstanding regions of Manitoba's boreal forest that represent the impressive diversity of wetlands, waterways, and forests found within this globally unique region.[1]

[1] A summary of literature cited, including wildlife populations, ecosystem services, and other information about these six locations, can be found at the end of the *Literature Cited* section.



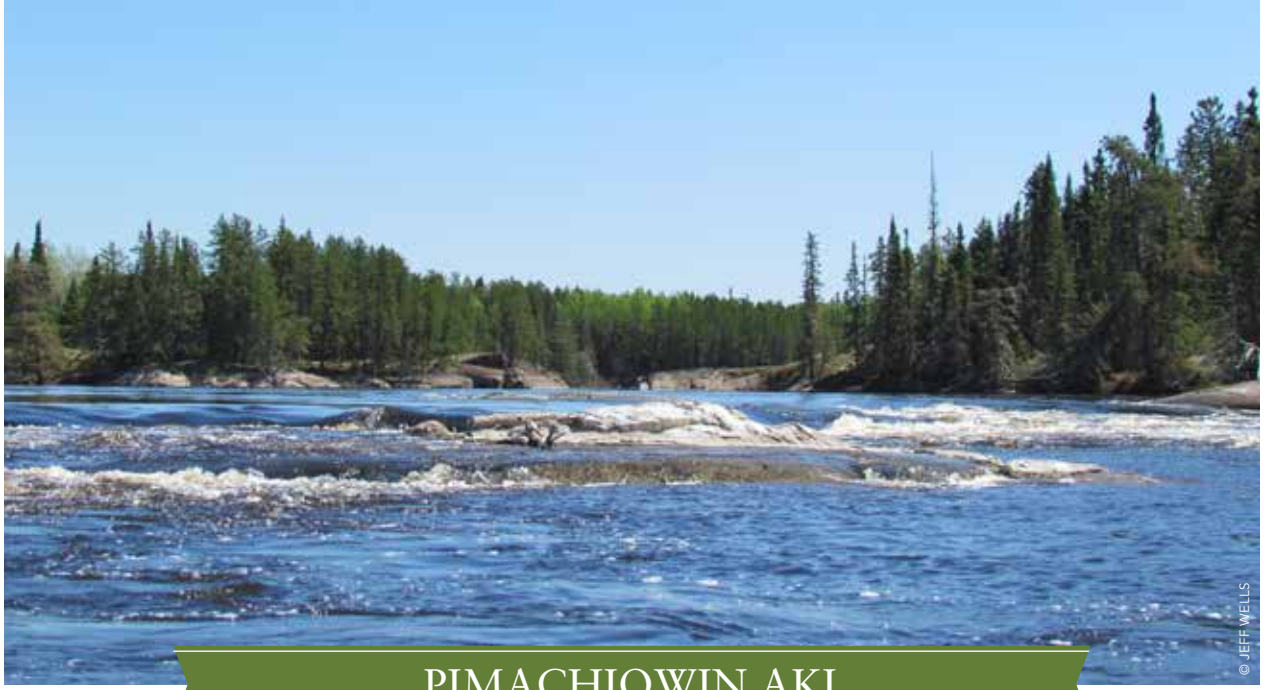
HUDSON BAY LOWLANDS



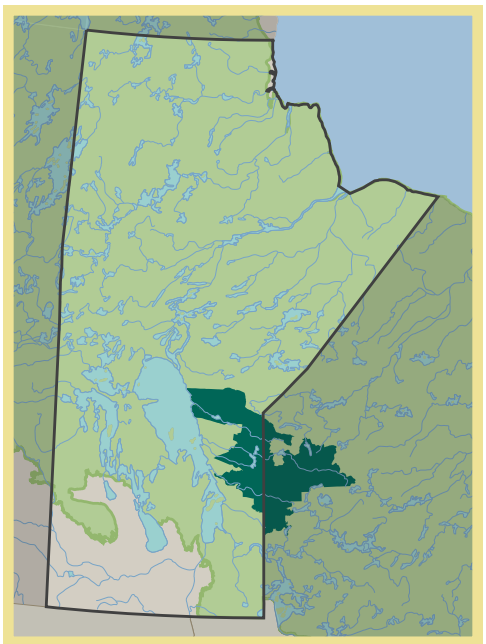
The Hudson Bay Lowlands region, which stretches from just north of Churchill and hugs the Hudson Bay coastland all the way down into Ontario, is one of the largest and truly unique wetland ecosystems anywhere in the world. When joined with its Ontario and Quebec counterparts, the Hudson Bay Lowlands form the third largest wetland network and single largest peatland system on Earth. These peatlands make the region one of the most carbon-dense terrestrial ecosystems on the planet.

The abundance of wetlands and waterways throughout the region provide habitat for a rich and unique combination of wildlife, particularly birds. The productive marine coastline supports exceptional concentrations of migratory waterfowl and shorebirds. Species like Hudsonian Godwit and Red Knot feed here to fuel journeys to wintering grounds in southern South America. Black Scoters, Lesser Snow Geese, and a host of other waterfowl are also highly reliant on the shoreline habitats here for refueling before making shorter migrations to winter homes in the United States.

Restricted-range species like Harris's Sparrow and Smith's Longspur reach their southeastern limits here, and species such as the Palm Warbler thrive in the vast peatland expanses across the region. The region's long stretches of coastal marshes are a stronghold for the mysterious and rarely seen Yellow Rail. The rivers and wetlands of the region provide a critical role in purifying and adding nutrients to water draining into Hudson Bay. The estuaries of Manitoba's major boreal rivers, particularly the Churchill, provide critical support during the calving stages of the iconic beluga whale. They also support remarkable populations of the ringed seal, which comprise the majority of the diet for the polar bears that have put Churchill on the map as an internationally renowned tourist destination.



PIMACHIOWIN AKI

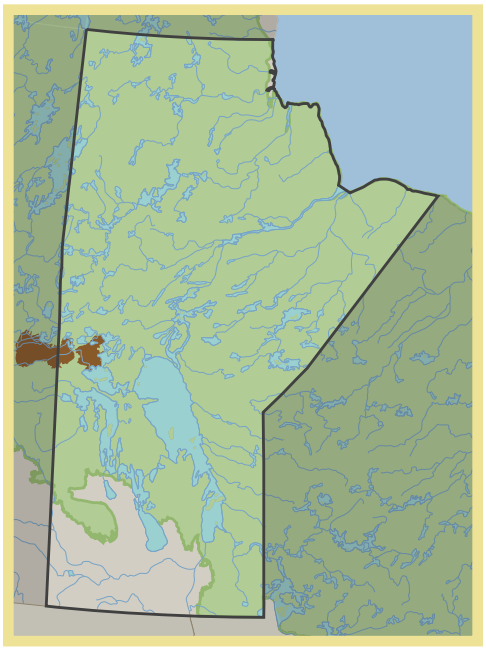


Pimachiowin Aki, which means "the land that gives life" in Anishinaabe, is a fitting name for one of the largest and most intact examples of the southern boreal shield ecoregion remaining in Canada. This 33,400 square-kilometre (8 million-acre) area has been nominated as a UNESCO natural and cultural World Heritage Site. Pimachiowin Aki comprises a remarkable collection of boreal forest habitats within a series of watersheds that originate in Ontario and flow westward to the eastern side of Lake Winnipeg. In fact, the region's four largest rivers provide the ailing lake with more than six million cubic metres of clean fresh water each year. This nominated area is still highly pristine and represents an integral and diverse portion of one of the single largest blocks of intact forest left on Earth.

Pimachiowin Aki is home to more than 40 native mammals, including some of Canada's most well-known: wolverine, moose, beaver, and timber wolf. It also encompasses much of the range of the Atikaki-Berens woodland caribou herd as well as other populations of woodland caribou further north. The vast network of streams and rivers also produce healthy populations of walleye, lake trout, lake sturgeon, and northern pike. A wide variety of songbirds thrive in the expansive, intact forests of the region, including some of Canada's most threatened. There are at least eight bird species represented in Pimachiowin Aki that are considered Species at Risk by COSEWIC: Piping Plover, Short-eared Owl, Common Nighthawk, Whip-poor-will, Olive-sided Flycatcher, Barn Swallow, Canada Warbler, and the Rusty Blackbird. Having declined by more than three-quarters in recent decades, these species depend heavily on the intact forests of Pimachiowin Aki. In total, as many as 216 bird species rely on the region, reinforcing its reputation as a stronghold for migratory birds.

The five First Nations—Bloodvein River, Little Grand Rapids, Pauingassi, Pikangikum, and Poplar River—whose ancestors have lived in the area for more than 6,000 years, are working together with the governments of Ontario, Manitoba and Canada toward a common goal: to protect, preserve, and gain international recognition of this most important boreal forest.

SASKATCHEWAN RIVER DELTA

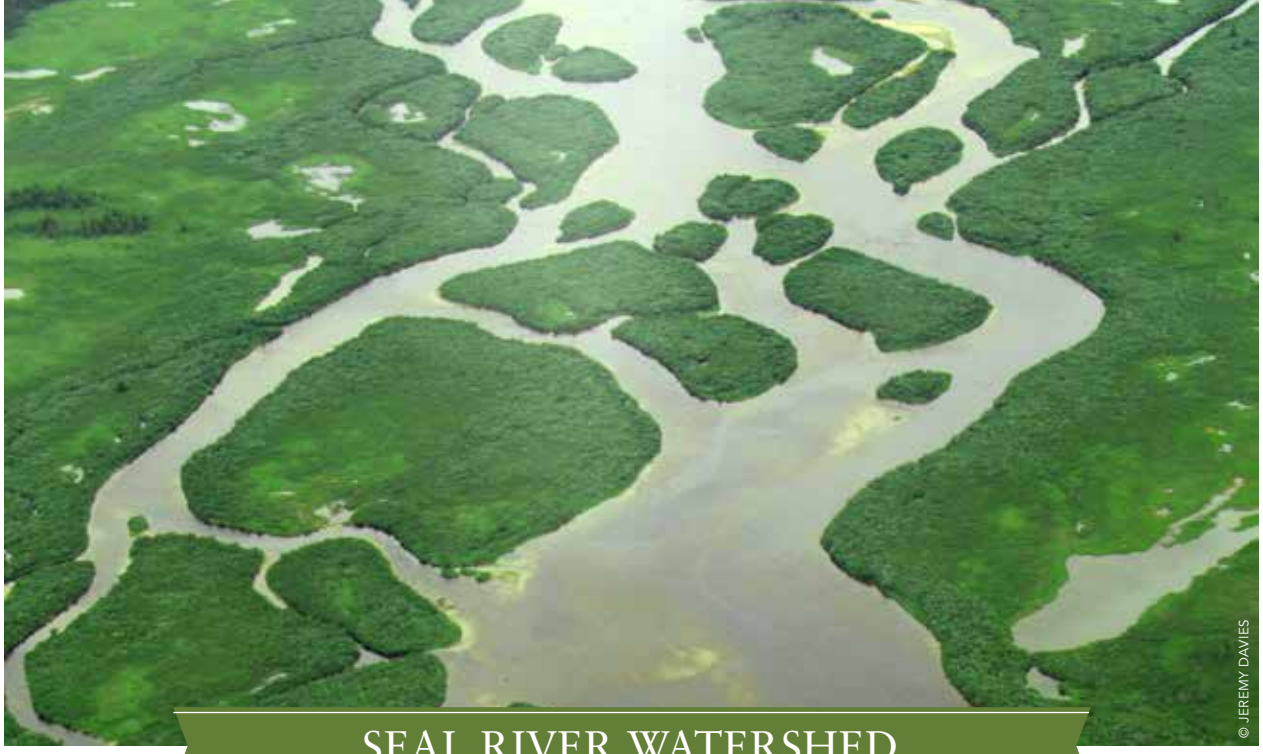


When the massive glacial Lake Agassiz retreated over thousands of years following the end of the last ice age, it left behind a remarkable, one-of-its kind dual river delta. The vast wetlands of the upper and lower deltas make the Saskatchewan River Delta one of the largest inland freshwater deltas anywhere in North America. The region is brimming with wetlands—more than 80 percent of the Saskatchewan River Delta is comprised of either wetlands or open, shallow bodies of water. The interwoven complexes of swamps, marshes, and fens have generated incredibly rich deposits of stored carbon. In fact, Manitoba's portion of the Delta and adjacent wetlands alone store more than 160 million tonnes of carbon—around eight times larger than Manitoba's total annual greenhouse gas emissions. They are also critical in removing pollutants and purifying water from the heavily impacted Saskatchewan River further upstream, helping to reduce nutrient input into Lake Winnipeg.

These flourishing wetlands are a haven for biodiversity. Some of the highest concentrations of plant diversity in the boreal can be found here, with more than 230 types of vascular plants documented in the region. They are joined by more than 40 mammals as well as more than 45 fish species. Moose, although in lower numbers now than they were historically, are still one of the many abundant mammals of the Delta.

Birds are perhaps most emblematic of how important the Delta is for wildlife, marked by its designation as an Important Bird Area. The Saskatchewan River Delta is known as one of the most important breeding and staging grounds for waterfowl in Canada's entire boreal forest region. Aerial surveys conducted by the Canadian Wildlife Service and U.S. Fish and Wildlife Service since the 1950s show that an average of nearly 500,000 ducks nest in the Saskatchewan River Delta each year. This includes an astonishing 120,000 Mallards, 84,000 Blue-winged Teal, 66,000 Lesser Scaup, and 34,000 American Wigeon. The Delta supports nearly 5 percent of the continental population of Ring-necked Duck (26,000) and Canvasback (26,000) and nearly 3 percent of Common Goldeneye (14,000) and Redhead (16,000). Its lake shores and islands are home to nesting Red-necked Grebes, American White Pelicans, Black Terns, Common Terns, Franklin's Gulls, Bonaparte's Gulls, Greater Yellowlegs, and Wilson's Snipe, among others. Hundreds and sometimes thousands of Sandhill Cranes use the Delta as a stop-over feeding site during migration. Threatened species like the seldom-seen Yellow Rail nest in its sedge marshes. During the spring and fall migration hundreds of thousands of migratory waterfowl pass through the Delta. In total, more than 200 bird species breed within or rely on the region during migration.

The Delta is also vitally important to the Cree communities who have called it home for millennia and who continue to harvest fish and wildlife from its forests and waters.



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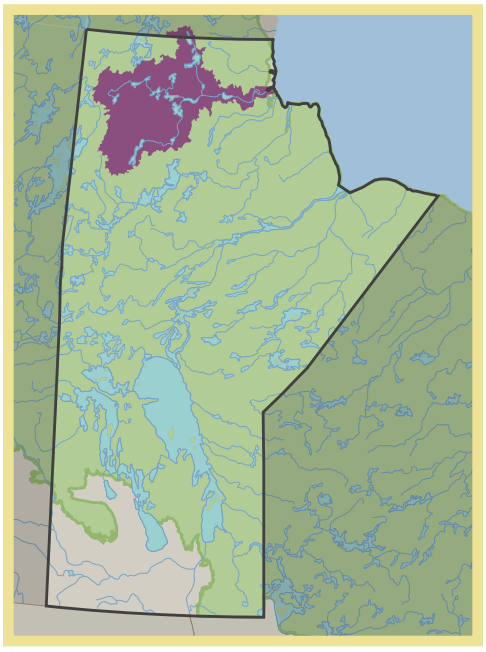
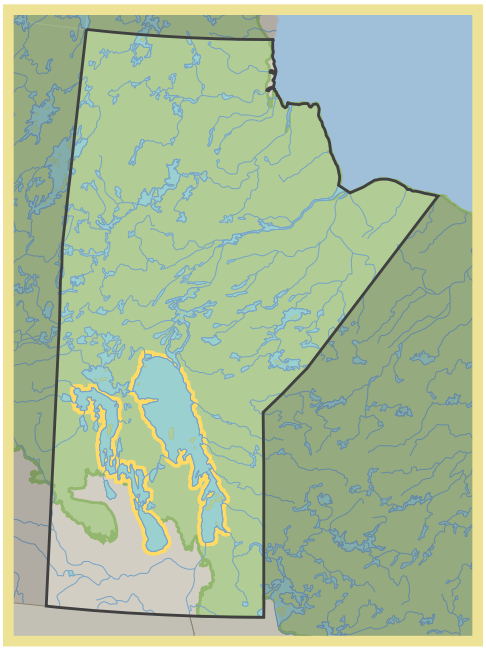
SEAL RIVER WATERSHED



Of the four major rivers that flow through Manitoba's boreal forest and empty out into Hudson Bay, the Seal River is one of only two that are wholly untouched by modern-day development. Within the traditional lands of the Sayisi Dene First Nation, the watershed offers a unique and diverse range of terrains and habitats that transition from upland barren lands to boreal forest to coastal tundra. The upper parts of its watershed are brimming with hundreds of uniquely shaped lakes that were carved out following the last ice age, which are mostly surrounded by vast and often brilliantly colorful expanses of tundra. The northern tree line is first entered further downstream, where small stands of black spruce are introduced shortly following a series of magnificent sand-crowned eskers. A series of powerful rapids navigate through yet another expanse of tundra and heath before eventually spilling into a long and scenic estuary at Hudson Bay.

The combination of its varied topography and the absence of industrial development have left the Seal River watershed with an incredible variety of wildlife. More than 30 types of rare plants scarcely seen elsewhere in Manitoba thrive in the lush environment. It provides the wintering grounds for the 400,000-strong Qamanirjuaq barren-ground caribou herd, which migrate down from Nunavut each year. The northern portion of the watershed remains one of the only places where grizzly bear, which had disappeared from Manitoba by 1923, are slowly making a return. Further downstream, the Seal River's estuary comprises the calving and feeding grounds for more than 3,000 beluga whales—the largest concentration in the world. The estuary has also been named an Important Bird Area for its role in supporting thousands of waterfowl, shorebirds, and seabirds, including large concentrations of Black Scoters, American Black Ducks, and Pectoral Sandpipers. Spring waterfowl surveys of the Seal River Estuary and adjacent Knife River Delta conducted in 2013 documented significant concentrations of spring breeding waterfowl indicating the regional importance of this area to ducks and geese. Some of its most unusual creatures are the harbour seals for which the river originally earned its name and which regularly travel inland as far as 200 kilometres (124 miles) from the coast.

MANITOBA'S GREAT LAKES



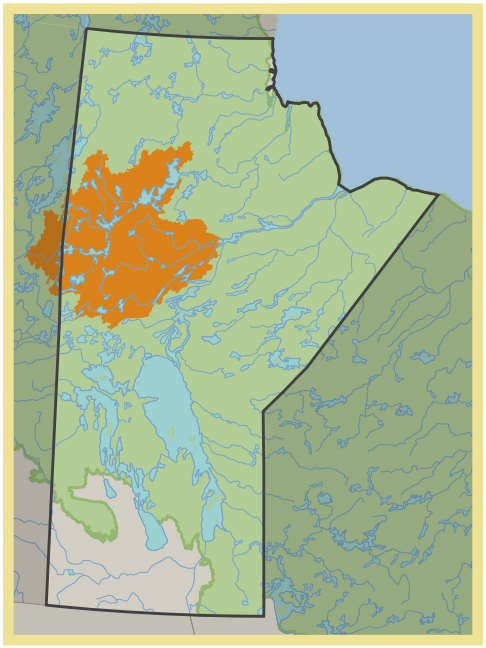
The Great Lakes of Manitoba live up to their name in every sense of the word. Distinguished from the Great Lakes of North America, Manitoba's Great Lakes—Winnipeg, Winnipegosis, and Manitoba—respectively represent the 3rd, 7th, and 9th largest lakes that are wholly within Canada and are among the top 35 largest lakes in the world overall. Their shorelines feature some of the lengthiest and most productive inland shoreline wetland systems anywhere in Canada. In addition to providing fish and wildlife habitat, they serve to protect the shoreline from erosion and serve as a last line of defense to these lake systems by filtering terrestrial runoff and associated pesticides, metals, fertilizers, and domestic and industrial sewage. Adding to the region's uniqueness, rare hypersaline (salty) springs and pools, particularly around the northern and western shores of Lake Winnipegosis, support entire ecosystems usually characteristic of marine environments.

The shores of Great Lakes of Manitoba are home to more than 20 First Nations and numerous Métis and non-Aboriginal communities. Many people of these communities rely on the health of these lakes to support their lives and livelihoods through tourism and commercial and/or subsistence fishing.

Manitoba's Great Lakes are vitally important for colonially breeding waterbirds. A 2012 survey documented more than 200,000 birds nesting at 131 sites. There were more than 80,000 Double-crested Cormorants found nesting at 47 colonies; more than 80,000 Ring-billed Gulls at 67 colonies; 25,000 American White Pelicans at 20 colonies; 16,000 Common Terns at 31 colonies; 8,000 Herring Gulls at 90 colonies; and over 6,000 Caspian Terns at 14 colonies.

In addition to the lakes themselves, the extensive coastal wetlands provide irreplaceable habitat and sustenance for a variety of plants, fish, and wildlife. The Gull Lake Wetlands adjacent to Lake Winnipeg, for example, contain 28 different rare species of orchids. As many as 19 sites within or along the lake coastlines have been designated as Important Bird Areas—the highest such cluster of any lake region within Canada. Hundreds of thousands of waterfowl regularly stage in the lakes during migration, with notably high concentrations of post-breeding Redheads in Lake Winnipegosis. Shallow protected marshy areas are important nesting areas for thousands of Western Grebes and Franklin's Gulls. Large quantities of fish thrive in the Great Lakes, including commercial staples such as walleye, lake whitefish, northern pike, and sauger. In fact, fish caught in Manitoba's Great Lakes comprise the vast majority of its $30 million annual fishing industry.

GRASS, BURNTWOOD, AND UPPER CHURCHILL RIVER WATERSHEDS



The Grass, Burntwood, and Upper Churchill River watersheds feature a varied landscape of rolling ridges and hills. They were formed by glacial deposits interspersed with permafrost peatlands in the north and flatter, poorly drained bogs, fens, and marshes more characteristic of the Manitoba Lowlands in the south. These landforms make the region a true mosaic of big and small lakes studded with rocky islands, flowing rivers and streams, cool black spruce-dominated peatlands, dry jack pine, white spruce, and aspen-dominated ridges and rocky hills, expansive water saturated fens with sedges and alder, and other habitats.

Woodland caribou thrive in this region, which contains several very large blocks of intact habitat. Female caribou can find forested islands in lakes and black spruce habitat islands in open peatland bogs for calving, where they are safe from predators. And throughout the year, both male and female woodland caribou are better able to evade predators and find sufficient food within the region's large remaining undisturbed and mature forests and peatlands. They are critical to the species' long-term survival. River otters, wolverine, and timber wolves are among many other mammals that also frequent the area.

The region's many lakes support thriving populations of fish, including northern pike, walleye, whitefish, lake trout, and in some areas the threatened lake sturgeon. Fish populations in turn support significant colonial waterbird nesting colonies, including hundreds of Common Terns and Herring Gulls and thousands of Ring-billed Gulls and Double-crested Cormorants. Bald Eagles and Common Loons also nest throughout the region, feeding their young on the abundant fish. Many waterfowl species breed here, including widespread Bufflehead, Common Goldeneye, Ring-necked Duck and Green-winged Teal. Wetlands support the threatened Yellow Rail as well as long-legged shorebirds like Solitary Sandpiper and both Greater and Lesser Yellowlegs as well as special songbirds like the LeConte's and Nelson's Sparrow. Manitoba's official bird, the Great Gray Owl, hunts the forest edges throughout the region and threatened Common Nighthawks occur in drier upland areas. The area abounds with the songs of boreal songbirds including Yellow-bellied Flycatchers, Tennessee Warblers, Magnolia Warblers, Swainson's Thrushes, and Ruby-crowned Kinglets.

These watersheds are home to a diversity of people, with multiple First Nations and numerous Métis and non-Aboriginal communities. Manitoba Museum archeological data show that the region has been inhabited for at least 7,000 years, when the people of the region sustained themselves strictly from hunting, fishing and collecting plant resources. Today, many of the First Nations and Métis inhabitants continue to practice traditional activities on the lakes and rivers that are integral to their lives.

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