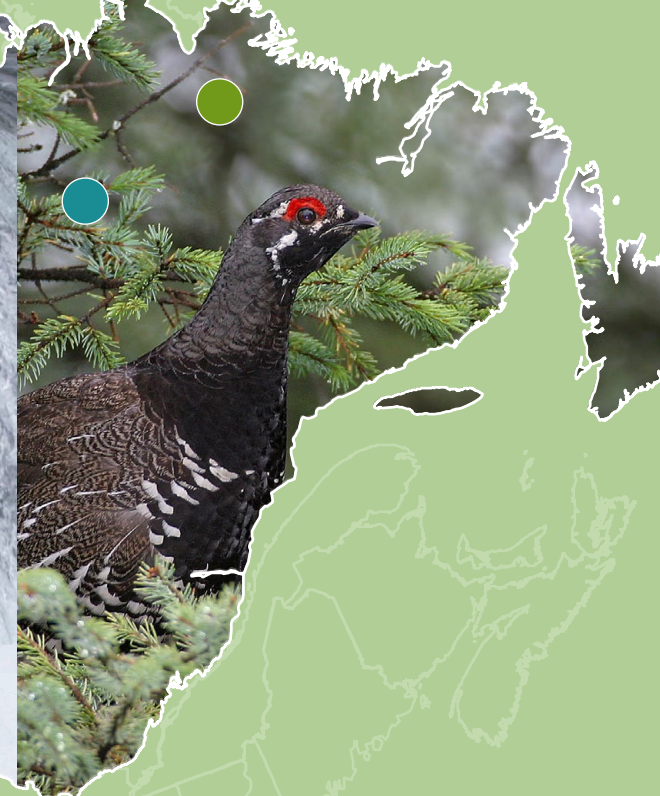
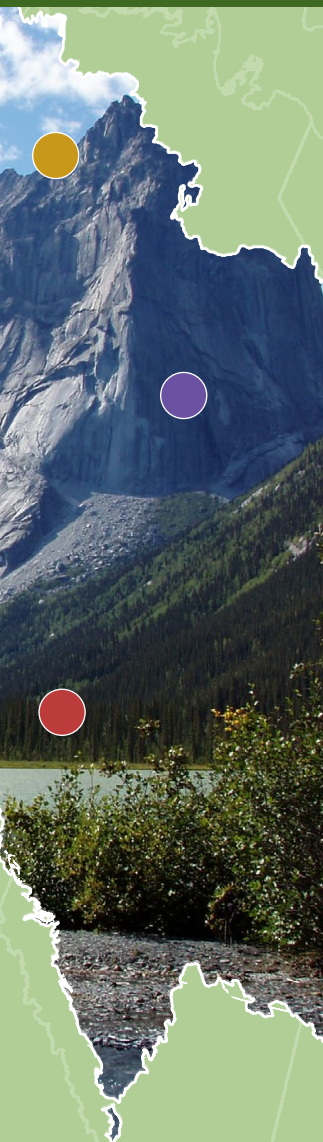


# 10 COOL CANADIAN BIODIVERSITY HOTSPOTS

How a New Understanding of Biodiversity  
Underscores the Global Significance of  
**CANADA'S BOREAL FOREST**



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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 INC.

Ducks Unlimited Inc. (DU) is the world's largest non-profit organization dedicated to conserving North America's continually disappearing waterfowl habitats. Established in 1937, Ducks Unlimited has conserved more than 13 million acres thanks to contributions from more than a million supporters across the continent. Guided by science and dedicated to program efficiency, DU works toward the vision of wetlands sufficient to fill the skies with waterfowl today, tomorrow and forever.

## 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.

## SUGGESTED CITATION

Wells, J.V., F. Reid, M. Darveau and D. Childs. 2013. *Ten Cool Canadian Biodiversity Hotspots: How a New Understanding of Biodiversity Underscores the Global Significance of Canada's Boreal Forest*. Boreal Songbird Initiative, Ducks Unlimited Inc., and Ducks Unlimited Canada, Seattle, Washington, Memphis, Tennessee, and Stonewall, Manitoba.

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All maps produced by Global Forest Watch Canada.

Graphic design by Red Lemon Creative.

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# Introduction

For many people, the term “biodiversity” has inadvertently become synonymous with species diversity. However, scientists now understand that biodiversity encompasses more than just the number of species in a region. Characteristics such as intactness of ecosystems, large-scale migratory phenomena, concentrations of abundance, and predator-prey dynamics are also important elements of biodiversity. Other key factors include unique behavioral and life history attributes, natural abundance and abundance cycles, subspecific genetic variability, local adaptations, and variability in behavioral traits. Intertwined with these special biodiversity features are other forms of conservation values such as ecosystem functions and flows and unique geological landscapes.

Acknowledging these underlying values is important in the global context of conservation planning. Previous models and mapping efforts have been overly focused on species diversity. This approach inherently favors warmer, tropical forests, which contain higher numbers of species packed into relatively smaller areas. Through understanding this more comprehensive definition of “biodiversity,” we see that forests such as Canada’s boreal forest gain substantial prominence—even more so when including broader conservation values such as the mitigation of climate change.

In this bulletin we highlight ten locations across Canada’s boreal forest that provide more detail and insight into its special biodiversity and conservation values. We also discuss some of the threats facing biodiversity in the region and showcase some of the groundbreaking conservation successes that have been achieved, particularly those led by Aboriginal peoples and governments.

## BIODIVERSITY AND THE BOREAL FOREST

One of the most striking features of the boreal forest is the ecological intactness of its forest and wetland ecosystems. More than 25% of the world’s never-before harvested forest lies within Canada’s boreal forest, including at least seven of the world’s top ten largest blocks of unfragmented forest (the others are in the Amazon

Basin). Canada’s boreal encompasses millions of lakes and ponds and in fact holds more surface freshwater than any other place on Earth. Four of the world’s top ten largest lakes are found here, including Great Bear Lake—arguably the world’s largest pristine lake, only featuring a single community of 300 people living on its shores. These boreal lakes are home to healthy, age-structured populations that include the largest known individuals on record of species such as lake trout, brook trout, and Arctic grayling. Canada’s boreal forest is also rich in free-flowing, undammed rivers—more than there are remaining in the rest of North America combined. While river biodiversity is imperiled by dams, pollution, and over-use in most of the world, those in Canada’s boreal are among the last strongholds for anadromous migratory fish populations. Pacific salmon still ascend the Stikine, Nass, and Skeena Rivers into the Sacred Headwaters of northern B.C. On the Atlantic Coast, where Atlantic salmon runs are lost or endangered in the U.S. and southern Canada, healthy populations still ascend rivers in the boreal regions of Quebec and Labrador.

The vast, ecologically intact forests and wetlands of Canada’s boreal forest and the immense populations of insects and fish they support in turn make the region incredibly productive for birds. More than 300 species occur regularly within Canada’s boreal forest, which combine to represent an estimated 1–3 billion individuals at the beginning of the nesting season and 3–5 billion when adults and young begin their southward migration. Some of these birds are highly specialized in habitat preferences and occur almost exclusively in the boreal forest. The Palm Warbler, for example, has 98% of its breeding range within the boreal ecoregion, where it specializes in nesting in peatlands—particularly those of Hudson Bay, one of the largest wetlands in the world at more than 370,000 km<sup>2</sup>. Wetlands such as these are some of the world’s largest storehouses of terrestrial carbon and are critical to filtering and storing remarkable quantities of freshwater. In fact, Canada’s boreal forest is estimated to hold more than 208 billion tonnes of carbon in its trees, soils, peatlands, and under permafrost—equivalent to 300 years worth of Canada’s annual greenhouse gas emissions at 2010 levels. Its freshwater inputs are



critical drivers of ocean currents that move nutrients around the globe, impacting global weather patterns and the productivity of marine fisheries.

Also currently preserved within Canada's boreal is one of the world's last examples of large-scale large mammal migrations—that of the more than 15 recognized migratory herds of caribou, some of which traverse thousands of kilometres from their northern tundra calving grounds to more southern boreal forest wintering areas. Large predators such as grizzly bears, timber wolves, and wolverines have disappeared from most of their historic North American range but still have healthy populations in the boreal.

Canada's boreal forest is also home to its share of biodiversity oddities and mysteries. There is the landlocked population of freshwater harbor seals found in Quebec's Tursujuq National Park. There are New World and Old World evolutionary lineages of both caribou and wolves, both of which persist in the boreal. There are also a variety of range-restricted wildlife species (species that occur over a relatively small area) like the Ungava collared lemming, Richardson's collared

lemming, singing vole, Dall's sheep, collared pika, the Whooping Crane, and the American bison to name a few.

As climate change continues to impact the planet, Canada's boreal forest becomes even more critical to protect. Its massive terrestrial carbon storehouse is crucial to maintain in order to prevent further carbon from being released into the atmosphere. Canada's boreal will also become increasingly important as a place of refuge for species forced northward by inhospitable climates farther south. Further, the best insurance for maintaining the resilience of plant and animal communities to climate change will be the preservation of intact, interconnected ecosystems and robust populations. Species that must shift ranges northward to survive will have their best opportunity to do so when unimpeded by fragmented habitat full of human-made barriers. Careful land-use planning now, that conserves large parts of Canada's boreal forest, is imperative to providing the best likelihood of survival for countless species and preserving the boreal's diverse ecological values.



# 10 Cool Canadian Biodiversity Hotspots in Canada's Boreal Forest

## PEEL RIVER WATERSHED

Former ice age refuge, harbors many unique plants and animals with diverse evolutionary lineages

## SOUTH NAHANNI WATERSHED

Remarkable collection of plant species and terrain, some of healthiest populations of large mammals

## THAIDENE NENE

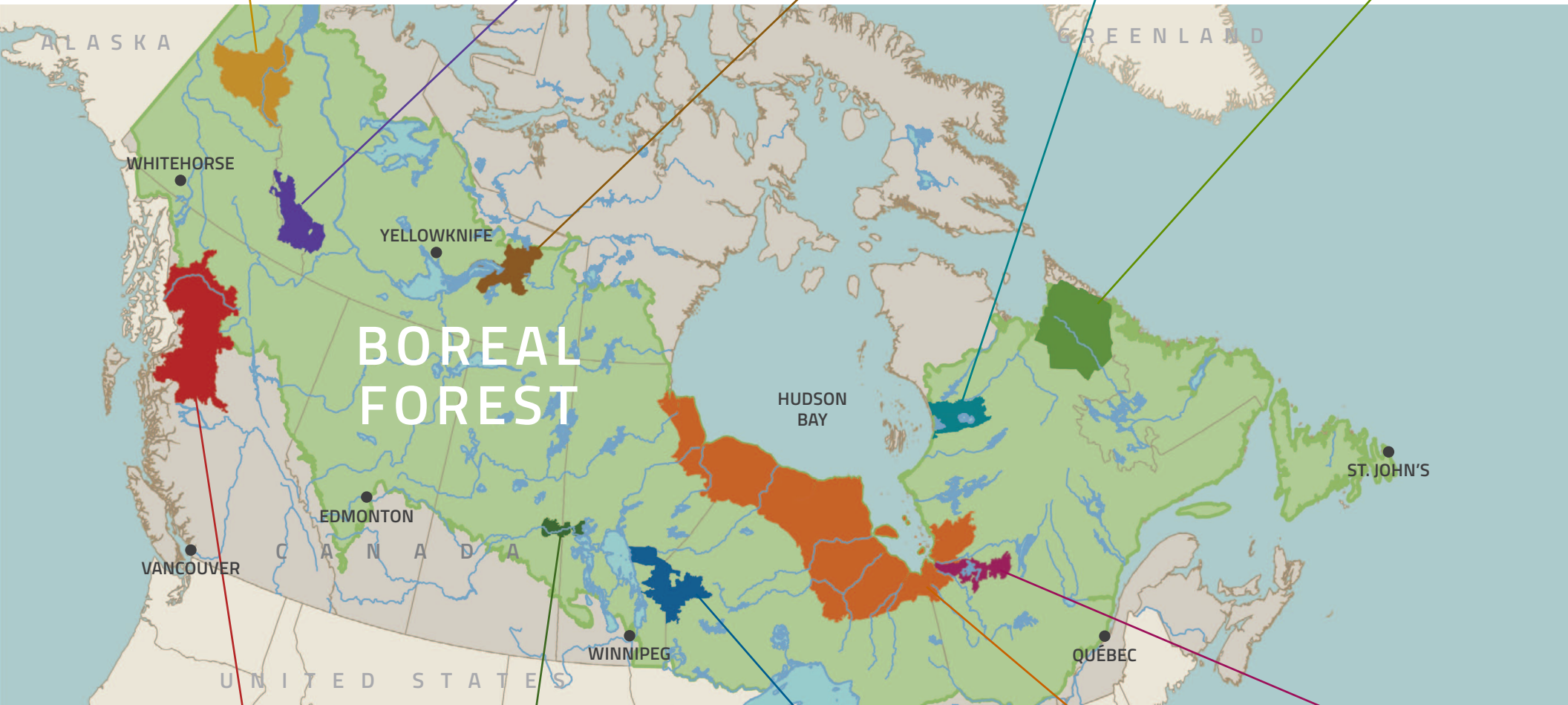
Rare combination of boreal and arctic species, shared habitat for three separate threatened caribou herds

## TURSUJUQ NATIONAL PARK

Home to rare landlocked seal and salmon populations, uniquely regional plant and animal communities

## CARIBOU HOUSE

Calving grounds for once-largest caribou herd on Earth, one of last refuges for Atlantic salmon



## SACRED HEADWATERS

One of last refuges for Pacific salmon, amazing collection of large mammals and predator-prey relationships

## SASKATCHEWAN RIVER DELTA

One of largest inland river deltas in North America, high densities of nesting wetland birds and other wildlife

## PIMACHIOWIN AKI

Rare collection of southern boreal plants and animals, part of one of largest intact forest blocks left on Earth

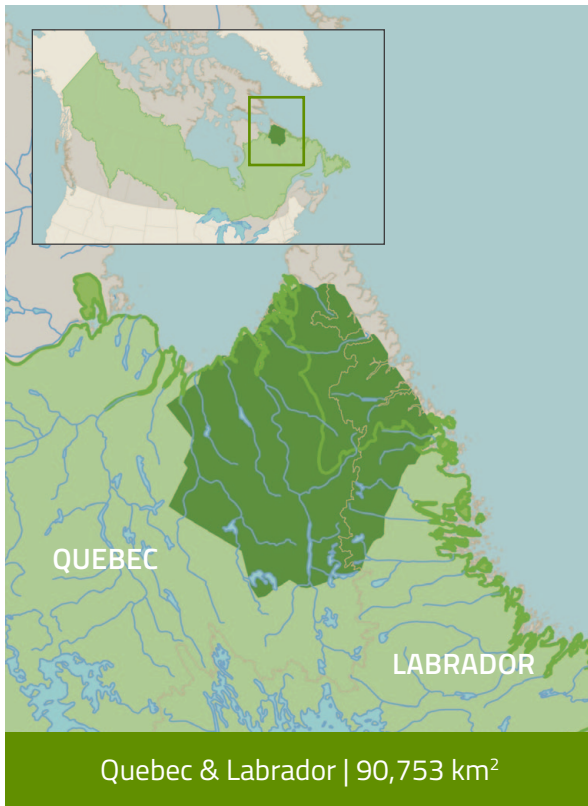
## HUDSON & JAMES BAY LOWLANDS

One of Earth's largest wetland complexes, globally important migratory bird staging area, critical polar bear refuge

## BROADBACK RIVER WATERSHED

Rare, mostly intact watershed in Quebec's James Bay region, refuge for caribou, fish and birds





# Caribou House

Few locations are as important to the earth's biodiversity as the one and only location where an animal population gives birth and raises its young. In the case of the George River caribou herd, which was until recently the world's largest herd of migratory tundra caribou, it is even more special. The herd's traditional 90,000-km<sup>2</sup> calving grounds—which straddle the Quebec-Labrador border and is often referred to as "Caribou House"—is a landscape where open, rocky barrens and boggy tundra-like habitats are intersected by river valleys with taller, spruce-dominated forest corridors and towered over by mountains in some areas. The area is the final destination for one of the world's largest mammal migrations, where the herd navigates thousands of kilometres northward in late winter and spring to reach the more open landscape that better allows them to avoid predators and make use of the nutritious plant life.

This unique area is home to large predators like black bears and wolves, while also providing important habitat for the tiny Ungava collared lemming, which only occurs in northern Quebec and Labrador. The mix of open land and mountainous terrain provides nesting habitat for some special raptors and owls, including Short-eared Owls—some of which have been directly tracked to wintering grounds in southern Ontario and northern New York State. There is a rare population of eastern North American Golden Eagles that winter in the Mid-Atlantic region of the U.S. The George River, flowing north 560 kilometres to Ungava Bay, is also free-flowing and contains no dams blocking access to spawning grounds for a healthy population of sea-run Atlantic salmon. These same waters provide the Arctic Ocean with crucial freshwater and nutrient inputs that are important for marine fisheries and global ocean currents.

## CONSERVATION STATUS

Estimated at more than 800,000 as recently as the early 1990s, the George River caribou herd has since declined to an estimated 27,000 individuals. Protection of the herd's calving grounds is vital if we are to continue to maintain this key species in the landscape of the North and prevent the loss of one of the few remaining large-scale mammal migrations left on Earth. The Government of Nunatsiavut in northern Labrador recently endorsed a proposal to put a 14,000 km<sup>2</sup> portion of the area off limits to mineral exploration and other industrial development, but is awaiting approval from the Government of Newfoundland and Labrador before the plan can become official. Additional sections of the herd's calving grounds are already protected within the Torngat Mountains National Park and within the George River and Pyramid Mountains interim protected areas, but the majority of the calving grounds in Quebec are without protected status and are vulnerable to industrial development, particularly mining.



George River © Valerie Courtois/Canadian Boreal Initiative





Hudson Bay Lowlands © Ken Abraham/Ontario  
Ministry of Natural Resources

# Hudson & James Bay Lowlands

If the boreal forest is the global 'king' of carbon, the Hudson Bay Lowlands would be the crown jewel. Wetlands dominate this open, expansive region in a way that is rarely found anywhere on Earth, and almost nowhere in terms of sheer scale. In fact, the greater Hudson Bay Lowlands (which include the James Bay Lowlands) form the third largest wetland region globally and contain the single largest peatland system on Earth. Peatlands are particularly rich in carbon, meaning the Hudson Bay Lowlands are potentially the most carbon-dense terrestrial ecoregion on Earth. The 373,000-km<sup>2</sup> expanse of wetlands and rivers that stretch from northeastern Manitoba to the James Bay region of Quebec is also mostly intact. Its vast area provides habitat for perhaps the world's highest abundance of the peat-loving Palm Warbler and very likely a high proportion of the global population of the mysterious Yellow Rail—a small, chicken-like marsh bird that is rarely seen and little studied.

The marine shores of the region are among the world's most important migratory feeding concentrations for shorebirds and waterfowl. In fact, the region as a whole likely hosts a large proportion of the global populations of many shorebird and waterfowl species during migration. Unusually high counts of species like Red Knot, Hudsonian Godwit, Ruddy Turnstone, Black Scoter, and Lesser Snow Goose indicate incredibly high use of these shoreline habitats. These lowlands are also unique as the host of the southernmost population of polar bears in the world—the only known population that regularly dens in burrows in earth rather than snow and ice. Both migratory tundra caribou and woodland caribou occur within the Hudson and James Bay Lowlands. Estuaries along the coast are also vital habitat for beluga whales, walrus, ringed seals, and bearded seals.

## CONSERVATION STATUS

Large-scale hydroelectric projects have greatly altered a number of major river systems within the region, including: the Nelson and Churchill Rivers of Manitoba, the Albany and Moose River watersheds of Ontario, and the La Grande, Eastmain, and Rupert Rivers of Quebec. There are a number of active and past mining projects in the area, including the Victor Diamond Mine near Attawapiskat in Ontario, and mineral exploration and early stage development is intensifying in the "Ring of Fire" chromite deposits of northern Ontario. Polar bear denning sites have been protected in Wapusk National Park and Polar Bear Provincial Park. Land-use planning is underway in many Aboriginal communities in Ontario and Quebec, and the provincial governments of Ontario and Quebec are committed to protecting at least 50% of the northern portions of both provinces. Currently, vast proportions of the area are unprotected and are currently open to mineral exploration and staking without the benefit of regional land planning for development and associated infrastructure.



Pimachiowin Aki © Jeff Wells

# Pimachiowin Aki

Pimachiowin Aki, which means “the land that gives life” in Ojibwe, undoubtedly lives up to its name. The Pimachiowin Aki proposed World Heritage Site is particularly unique because it is one of the last remaining large ecologically intact portions of the southern boreal forest, which has otherwise been heavily fragmented by industrial forestry and other types of development. In fact, the area is part of one of the largest remaining blocks of intact forest habitat in the world. As many as 44 native mammal species are known to occur there, including iconic species such as woodland caribou, wolverine, moose, beaver, and wolf. The region is also one of the few remaining strongholds of relatively stable and healthy woodland caribou herds left in Canada’s boreal forest. As many as 216 species of bird can be found in Pimachiowin Aki, with around 170 species regularly breeding there during summers. This includes some of North America’s most heavily-declining songbirds, such as the widespread Rusty Blackbird and Olive-sided Flycatcher and the southern boreal-restricted Bay-breasted Warbler, Canada Warbler, Connecticut Warbler, and Evening Grosbeak. They are joined by some of Canada’s healthiest populations of fish (walleye, pike, trout, sturgeon, and others) and a variety of amphibians and insects.

The 33,400-km<sup>2</sup> Pimachiowin Aki proposed World Heritage Site also features varied landscapes, ranging from mostly needleleaf and broadleaf forest stands to more shrub and wetland-dominated areas. This diverse landscape positions the region to be better able to withstand changes coming from climate change. The four highest volume rivers that originate or flow through Pimachiowin Aki also provide 6,889,000 cubic metres of pristine, uncontaminated water to Lake Winnipeg annually, helping to prevent the lake’s already poor condition from worsening.

## CONSERVATION STATUS

While the World Heritage Site proposal for Pimachiowin Aki is under consideration by UNESCO, the five First Nations whose territories occur within Pimachiowin Aki have developed land-use plans and designated portions of their traditional lands as protected areas with the support of the provinces of Manitoba and Ontario. Through these land-use planning initiatives and earlier initiatives, nearly 90% of the region is under conservation protection—an area of more than 28,000 km<sup>2</sup> or nearly five times the size of Prince Edward Island. For example, the Poplar River First Nation’s land-use plan placed 90% of its traditional territory in conservation areas encompassing over 8,000 km<sup>2</sup>, with official endorsement from the Government of Manitoba. The Bloodvein First Nation in Manitoba developed a land use plan that places more than 50% of its traditional territory under conservation—an area of over 2,100 km<sup>2</sup>. The Pikangikum First Nation in Ontario has also developed a land-use plan that balances protected areas with community-led forestry.





Tupatukasi Waterfall © User:Lkovac/Wikipedia

# Broadback River Watershed

The Broadback River of Quebec's Eeyou Istchee region is one of the few large, undammed rivers remaining in Quebec. Its surrounding watershed also holds the last remaining networks of large, old-growth forest in northwestern Quebec. The area is crucial as a stronghold in Quebec for the increasingly endangered woodland caribou, which has disappeared from half of its former North American range. All three major caribou populations identified by the Cree in Quebec's James Bay region have experienced considerable decline in recent years, two of which are known to regularly frequent and rely on the Broadback region for sustenance.

The sweeping 21,000-km<sup>2</sup> Broadback River watershed not only encompasses two of the seven major boreal ecozones (Hudson Plains and Boreal Shield), but is one of the southernmost examples of intact boreal forest habitat remaining in Quebec. The watershed provides fish and other aquatic wildlife a rare network of pristine, free-flowing habitats with numerous rapids and small waterfalls. The Quebec emerald—a dragonfly found only in Quebec and portions of the Maritimes—is one of the specialized species found here. The watershed has long been known by anglers for its healthy populations of large brook trout and trophy-sized northern pike. The Broadback River watershed also attracts a variety of birds due to its length and ecological diversity. This ranges from songbirds, such as the Rusty Blackbird, Bay-breasted Warbler, Canada Warbler, and Evening Grosbeak, and shorebirds, such as the Solitary Sandpiper and Greater Yellowlegs, to waterfowl, including American Black Duck and Common Goldeneye.

## CONSERVATION STATUS

Heavy logging to the south and east of the watershed and large hydroelectric developments to the north have left a wide-sweeping footprint on this greater, once-pristine region. This includes more than 30,000 km of forestry roads crisscrossing the surrounding landscape. Mining exploration claims have been staked in some of the most intact parts of the watershed and have increased in recent years. Maintaining the Broadback's ecological integrity will be crucial in sustaining resident woodland caribou populations. The Grand Council of the Cree and the individual First Nation communities of the region have developed a Broadback Watershed Conservation Plan that would add 9,355 km<sup>2</sup> of new protected areas and a 10,866-km<sup>2</sup> special management buffer that would allow some forms of industrial development to be carried out using modern responsible and sustainable development principles. An endorsement of the Plan by the Quebec Government would demonstrate commitment and real progress in its vision of a balanced approach to conservation and planning within Quebec's north.



# Thaidene Nene

The retreat of the last ice age left Great Slave Lake—the ninth largest lake in the world and deepest in North America—connected through a vast network of lakes, wetlands, and rivers in the surrounding area. The East Arm in particular was heavily carved out by the recession of ice and glaciers and now forms one of the most western representations of the Canadian Shield. It features a diverse mixture of primarily treed areas that open into expanses of tundra and is speckled with exposed layers of bedrock throughout. It also left the eastern portion of the lake a showcase of stunning cliffs and extensive island networks. A 33,500-km<sup>2</sup> study area for the proposed Thaidene Nene protected area encompasses an unusual transition zone from more heavily-treed boreal forests to the south and west into more tundra-dominated landscapes to the north and east. This transition and variability provides a buffer for plants and wildlife in the region and positions it well in terms of its ability to adapt to changes related to climate change.

This unique and varied geographical landscape also provides habitat for a variety of wildlife that would otherwise be more sparsely populated in the region. The eastern reaches of the lake and surrounding foothills are the southernmost region of Canada to support musk ox populations. It is also one of the only places in the Northwest Territories to remain a stronghold for three separate declining herds of migratory barren-ground caribou: the Bathurst, Beverly, and Ahik herds. These iconic species are joined by a variety of other mammals, including bear, wolf, moose, beaver, otter, mink, and marten, as well as many other species of birds and fish. This region of Great Slave Lake is famous for producing some of the world's largest trophy lake trout—fish in excess of 20 kilograms are caught regularly in the area. The many islands also support colonies of gulls and terns, while the cliffs provide important nesting sites for Bald Eagles and Peregrine Falcons.

## CONSERVATION STATUS

The Lutsel K'e Dene First Nation is in advanced negotiations with Parks Canada to establish Thaidene Nene as a protected area, which would be jointly managed between Lutsel K'e Dene First Nation and Parks Canada. The land has been under temporary protected status since 2007. Mineral exploration and development activity across the territory has vastly increased, making the permanent protection of Thaidene Nene critically important.



Talston River © J. Charlwood





Saskatchewan River Delta © Ducks Unlimited Canada

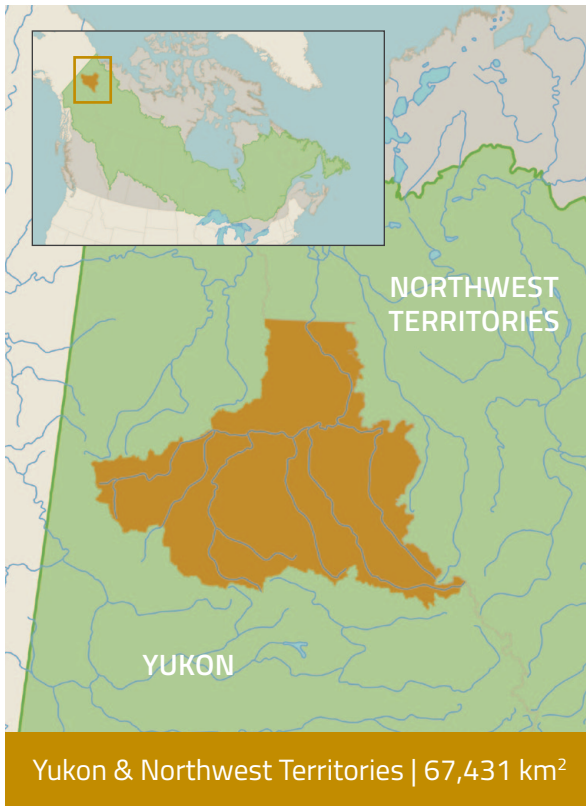
# Saskatchewan River Delta

Formed through the retreat of the massive glacial Lake Agassiz following the last ice age, the 9,800-km<sup>2</sup> Saskatchewan River Delta—which spans the border of Saskatchewan and Manitoba and actually consists of an upper and lower delta—is one of the largest inland freshwater deltas in North America. The area has deep deposits of carbon-rich sediments that have accumulated over thousands of years, underlying shallow lakes, bogs, fens, and freshwater marshes that are interwoven with streams, rivers and associated forested riparian corridors. The Manitoba portion of the Delta alone is estimated to hold 100 million tonnes of carbon, largely due to the abundance of wetlands, which make up the majority of the Delta as a whole. This wetland habitat and rich supply of nutrients attracts large numbers of fish and wildlife, with as many as 200 bird species, 48 fish species and 43 mammals known to occur within the region. Plant diversity is high as well, with at least 231 species of vascular plants documented from the area.

The site is globally significant for its concentration of waterbirds, including hundreds of thousands of nesting waterfowl. Many ducks occur here in breeding densities that are among the highest within the western boreal region. Surveys in the 1970s estimated 72,000 nesting Ring-necked Ducks (which would represent 10% of the world population of the species) as well as 36,000 Redheads, 30,000 Canvasbacks, 19,000 Gadwall, and 14,000 Common Goldeneye. Blue-winged Teal and Mallards are also abundant breeders in the region. Other wetland-dependent birds that nest here in high densities include Eared Grebe, Sora, Virginia Rail, Sandhill Crane, American Bittern, American Coot, and Pied-billed Grebe. The Delta also acts as a seasonal refuge for birds—particularly waterfowl—that become displaced by drought further south in the prairies. It is a critically important fall staging area for waterfowl, large numbers of which have been documented through banding studies to be passing through or wintering in the Mississippi Flyway.

## CONSERVATION STATUS

The area has seen major changes in flows of water and nutrients into and through the system because of hydroelectric dam development on the rivers above and below the Delta and from water removal for irrigation and other uses upstream. About 40,000 hectares of the eastern section of the Delta was inundated above the Grand Rapids Dam. At least 12,000 hectares of habitat was also drained for agriculture as well. Ducks Unlimited Canada began to play a major water management role in the Saskatchewan River Delta in the 1940s in response to the prairie drought of the 1930s, and currently maintains 200,000 hectares of habitat in the area in cooperation with the Manitoba and Saskatchewan governments. A number of conservation areas have been established in the region, including the 96,000-hectare Saskeram Wildlife Management Area and the 214,000-hectare Tom Lamb Wildlife Management Area. Ducks Unlimited Canada continues to research best water management practices for increasing nesting success of different bird and mammal species in the region. The need for additional protected areas has been identified by the Manitoba government.



# Peel River Watershed

Most of northern North America was once covered by an unimaginably vast ice sheet for thousands of years. But a few special islands of land in the North remained free of this life-stopping deep freeze. The 67,000-km<sup>2</sup> Peel River Watershed was one of these wildlife refuges that allowed many species to survive the ice ages. Today, this ancient “Noah’s Ark” is still virtually undisturbed by modern large-scale industrial activities and retains many of these relict rare and range-restricted species of mosses, vascular plants, and animals. Range-restricted mammals like the mountainous Dall’s Sheep, the singular singing vole, and the collared pika occur within the watershed while many other mammals show genetic footprints that indicate a distinct separate evolutionary history from their look-a-like cousins in the rest of Canada. Separate evolutionary lineages of otherwise widespread fish species can be found in many fish populations in the Peel River Watershed.

From rugged mountain peaks, high plateaus, and deep canyons to sprawling river valleys and wetland networks, the Peel River Watershed is among Canada’s most scenic and geographically diverse natural wonders. Six parallel tributaries emerge from the northern slopes of the Rocky Mountains and converge in the underlying valley to form the Peel River, which eventually drains into the Mackenzie River Delta and the Arctic Ocean. Fish such as broad whitefish, least cisco, arctic cisco, and inconnu swim upstream from the Arctic Ocean to the Peel Watershed to spawn. The region serves as the wintering grounds for the iconic Porcupine caribou herd—a transboundary herd of barren-ground caribou that summers in Alaska’s Arctic National Wildlife Refuge—and is the home of Yukon’s only population of boreal woodland caribou. Healthy populations of grizzly bears, wolverines, and wolves occur here as well. The Peel Watershed provides important nesting habitat for raptors, including Peregrine Falcons (45 pairs as of the 1990s), Gyrfalcons, Bald Eagles, and Golden Eagles.

## CONSERVATION STATUS

The region has become the focus of intense interest by the mining industry, as evidenced by the more than 8,000 active mining claims in the watershed. A portion of the region has also been identified as an area of interest for oil and gas development. The Yukon government set up a Peel Watershed Planning Commission, which worked over many years and with many public meetings to develop a series of recommendations for this remarkable region. In November 2011, the Commission released its final recommendations, which called for protection of more than 52,600 km<sup>2</sup> of the watershed from mining and other industrial development. Unfortunately, the Yukon government has signaled its intention to protect only a small fraction of the region and keep large areas open for mining despite the Commission’s recommendations.



Peel Watershed © Juri Peepre



Nahanni © Cathy Wilkinson

# South Nahanni Watershed

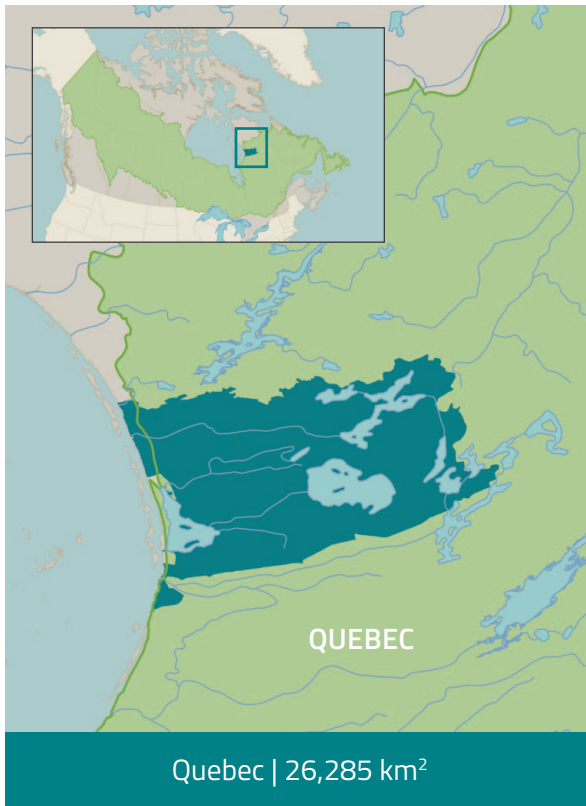
Few places in North America can boast of having the type of dramatic mountain scenery found in Nahanni and Naats'ihch'oh National Park Reserves. These adjacent parks, which combine to encompass the majority of the South Nahanni River watershed, are truly a spectacle to behold. The region's rugged sawtooth peaks, deep canyons, twisting rapids, and awe-inspiring waterfalls match those of its southern sisters in Banff and Jasper, but contain fewer access points, visitors, and a lower overall human footprint. It contains four separate canyons that rise more than 1,000 metres above the South Nahanni, rivaling that of Yosemite Valley and only overshadowed within North America by the Grand Canyon. The walls and floors of the canyons are riddled with complex networks of limestone caves, underground rivers, labyrinths, and sinkholes. The Rabbitkettle Tufa Mounds—large mounds built up over the past 10,000 years from geothermal pressure—rise up as high as 30 metres in a series of small, terraced hot spring pools. The gem of the park, Virginia Falls, plunges more than 90 metres down on either side of Mason's Rock, nearly twice the height of Niagara Falls.

The combined 35,000-km<sup>2</sup> Nahanni and Naats'ihch'oh National Park Reserves offer far more than just scenery. Nearly 600 types of vascular plants can be found in the region, offering a type of floral diversity found in few other parts of the boreal. They are joined by at least 40 mammal species, 170 bird species, as well as healthy populations of a variety of fish, such as trout, grayling, pike, and whitefish. The region supports critical numbers of caribou, grizzly bears, as well as numerous bird species, including the Spruce Grouse, Common Nighthawk, Olive-sided Flycatcher, Townsend's Solitaire, Gray Jay, Tennessee Warbler, American Tree Sparrow, Lincoln's Sparrow, Rusty Blackbird, and the White-winged Crossbill. This incredible combination of physical beauty and abundance of wildlife has not gone unnoticed. In 1978, Nahanni National Park became the first-ever designated UNESCO World Heritage Site anywhere in the world.

## CONSERVATION STATUS

Mining activity is the single greatest threat to the ecological integrity of the South Nahanni Watershed. In 2009, the Dehcho First Nations and the Government of Canada announced the expansion of Nahanni National Park Reserve, which is now six times the size of the original one established in 1972. The Sahtu First Nations also partnered with the federal government to protect the upper reaches of the watershed within the Naats'ihch'oh National Park Reserve. Naats'ihch'oh was established in 2012, although the final boundaries left many important conservation areas open to mineral development. It is expected that these areas will be carefully managed under the terms of the forthcoming Sahtu Land Use Plan.





# Tursujuq National Park

Along the northern shores of Hudson Bay in northwestern Quebec lies the 26,000-km<sup>2</sup> Tursujuq National Park, a pristine network of rivers and streams that weave together a wetland fabric of marshes, peatlands, ponds, and lakes. These culminate with some of Quebec's most unique lakes: the Lacs des Loups Marins (Seal Lakes) and Quebec's second largest lake, Lacs à l'Eau-Claire (Clearwater Lake), which was formed by an ancient massive meteor strike. Further downstream lies a rare brackish estuary called "Tasiujaq" in Inuit, which drains an immense volume of water into and from the sea through one narrow opening at each change of tide. In the summer, the iconic white beluga whales come to these waters to find sanctuary. The waterways and wetlands further upstream are home to a remarkable number of water-dependent species. The most surprising is its resident race of freshwater harbor seals. Apparently landlocked for thousands of years, these seals somehow find enough open water and food through the winter for survival. Equally unique is Tursujuq's isolated population of land-locked Atlantic salmon. They are at least 800 kilometres from the nearest known population of the species.

The threatened eastern races of both Harlequin Duck and Barrow's Goldeneye can be found in summer, while Black Scoters and Long-tailed Ducks can be seen along the ocean shores. The coastline includes numerous "cuestas," long ridges with cliff faces that are nesting sites for Peregrine Falcons, Golden Eagles, and Rough-legged Hawks and support thriving communities of rare plants, mosses, and lichens. These species are joined by numerous songbirds to combine for a total of at least 131 bird species known to frequent the region. The new park is also part of a migration corridor and wintering area for caribou. Given the drastic declines in both the Leaf River and George River caribou herds of northern Quebec, the park is expected to have great benefit for these animals.

## CONSERVATION STATUS

The Inuit people of Nunavik in northern Quebec, the Grand Council of the Cree, and the Government of Quebec announced the creation of Tursujuq National Park in December of 2012. The park is now the largest protected area in eastern North America and one of the largest parks on the continent. The park is also thousands of square kilometres larger than it had been expected to be just a few years ago based on the recommendations of the Inuit and Cree communities of the region. Tursujuq National Park will be managed by the local Katavik Regional Government, and the Inuit and Cree communities will continue to practice a subsistence lifestyle there. The cooperative effort and vision among the Inuit of Nunavik, the Grand Council of the Cree, the Government of Quebec, and conservation advocates have ensured a healthy future for this global treasure.



Tursujuq © Josée Brunelle/KRG





Sacred Headwaters © J. Michael Fay

# Sacred Headwaters

Deep in the heart of British Columbia's remote northwestern corner lie the headwaters of some of Canada's most important salmon-bearing rivers: the Skeena, Nass, and Stikine. Despite draining into separate parts of the Pacific Ocean along different routes (two via Southeast Alaska), all three rivers originate within 100 km of each other in the Skeena Mountains and Spatsizi Plateau. Heavy fishing and large hydroelectric dams have heavily impacted salmon populations further south, leaving this region as one of the last truly wild refuges for Pacific salmon populations in Canada. The rugged alpine mountains and lush river valleys below provide pristine habitat for a remarkable population of large mammals, from caribou, mountain goats, moose, and Stone's sheep to predators such as wolf, grizzly and black bear. Overall, the region is one of the largest predator-prey ecosystems anywhere in North America, lending to its informal nickname as the "Serengeti of the North." These larger species are joined by abundant and healthy populations of migratory and freshwater fish, including rainbow trout, northern pike, Arctic grayling, dolly varden, and Arctic char.

The Sacred Headwaters watershed is a dramatic landscape of high mountain peaks and enormous glaciers that plummet rapidly down into low-lying river valleys, where enormous varieties of plants and animals flourish. Rivers cut their way through large mountain ranges, leaving behind steep cliffs and canyon walls that rise hundreds, and in some cases more than 1,000, metres into the air. Irregular rainfall patterns have created as many as eight different biogeoclimatic zones, which can range from near-desert conditions all the way to temperate and boreal forest ecosystems within a matter of kilometres, providing levels of geographical diversity rarely found elsewhere in Canada.

## CONSERVATION STATUS

The Sacred Headwaters region is under heavy pressure for development from the metal mining, coal mining, and oil and gas industries. The Tahltan First Nation communities within the region have fought to assert their rights to land-use decisions, including the use of blockades and other non-violent protests. A plan by Shell Oil for a massive coalbed methane project was shelved in 2012 after many years of conflict. The proposed Red Chris open pit copper-gold mine has continued to move forward despite legal challenges from Tahltan communities. In addition, there are several hydro projects underway within the region, and a proposed new major electricity transmission line is expected to provide opportunities for further industrial development.







## ACKNOWLEDGEMENTS

The authors of this bulletin would like to acknowledge the more than 600 First Nation communities scattered throughout Canada's boreal forest. While this bulletin is primarily focused on the unique biodiversity contributions of the boreal forest, the acknowledgement of First Nations and their rights to sustainably manage their own traditional lands is imperative to any conservation efforts within the boreal. Many of these communities have existed in various forms for thousands of years, and many continue to rely on traditional forms of subsistence to this day.

We also acknowledge that many First Nations view resource development as an important component of their economic wellbeing. Inasmuch, the authors endorse the basic premises of the Free, Prior and Informed Consent model (FPIC) for how companies and governments should address and incorporate First Nations into development planning. At a larger spatial scale, the authors endorse the Canadian Boreal Forest Conservation Framework as a large-scale planning model for how to successfully conserve the global ecological values of Canada's boreal forest while still allowing for carefully planned, sustainable resource development.

## ABORIGINAL PEOPLES OF CANADA'S BOREAL FOREST



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