WWF

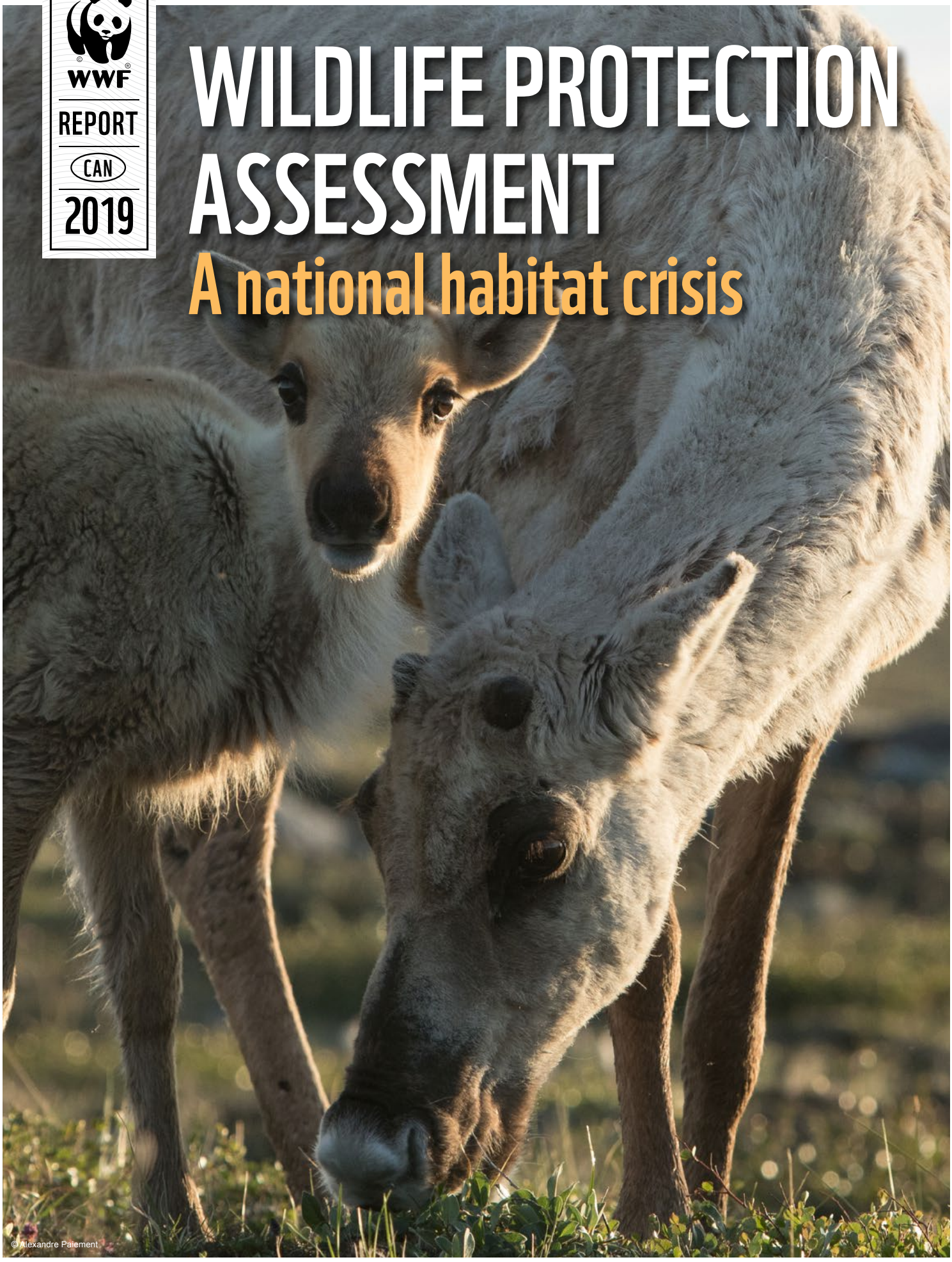
REPORT

CAN

2019

# WILDLIFE PROTECTION ASSESSMENT

## A national habitat crisis



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WWF-Canada's ***Wildlife Protection Assessment: A National Habitat Crisis*** could not have been developed without the expertise, analytical skills, and contributions of several individuals.

Joyce Arabian, Jessica Currie and James Snider led the analysis as part of WWF-Canada's Science, Research and Innovation (SRI) team, harnessing the power of GIS and Tableau for data visualization.

Core principals and conceptual design were contributed by Hussein Alidina, Colin Anderson, Angèle Blasutti, Antonio Iacobelli, Kevin Kavanagh, Reed Noss and Stan Rowe during the formulation of a protected areas gap analysis tool which was developed for WWF-Canada's Endangered Spaces campaign. Recently, a revival and refurbishment of the original tool was endeavored by Courtney Hamilton, Delany Jacobs and Lakshmy Vasanthamohan as part of a GIS program through Fleming College.

Special thanks for review and support to Richard Schuster (Carleton University) and Oscar Venter (University of Northern British Columbia).

Funding for WWF-Canada's ***Wildlife Protection Assessment: A National Habitat Crisis*** came from over 100,000 individual Canadians who donated in support of WWF-Canada's wildlife conservation work all across the country.

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**Why we are here.**
We are creating solutions to the most serious conservation challenges facing our planet, helping people and nature thrive.

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# ARE CANADA'S ECOSYSTEMS, HABITATS AND WILDLIFE WELL PROTECTED?

**To answer these questions WWF-Canada has mapped gaps in the ecological representation of our existing protected area network and contrasted them with areas of high priority based on the density of at-risk species, natural carbon stores and climate refuges.**

## ECOLOGICAL REPRESENTATION:

Ecological representation of protected areas is a key component of the Convention on Biological Diversity. It speaks to the need to represent the full range of physical habitats within a protected areas network to effectively safeguard wildlife.

Just as we need housing, wildlife need somewhere to live. Half of Canada's monitored species are in decline, by a staggering 83 per cent, and even wildlife protected under Canada's Species at Risk Act are failing to recover. Wildlife simply can't survive with increasingly degraded or destroyed habitats they need to find food, mate, migrate and raise their young. Climate change only makes matters worse.

Canada is committed to protecting at least 17 per cent of terrestrial space and inland waters, and taken together these spaces should represent the different types of habitat wildlife need, creating a connected network of protected areas. This assessment reveals that while protected areas in Canada do carve out space primarily for nature, they do not protect the vast majority of habitats where most at-risk species live.

Widespread habitat fragmentation and loss is a double-whammy for wildlife since vital, natural spaces like forests, peat bogs and soils provide both habitat and an essential service: These natural areas store carbon and if protected, can help keep the climate in balance.

Canada is warming at twice the global rate. This assessment provides a vital map for **reducing biodiversity loss and limiting climate change at the same time**. Given these crises, we need to ask more of our protected areas. It's essential we prioritize protection in the spaces wildlife need, and in those areas that will provide nature-based solutions to help us reach our climate change goals.

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# OPPORTUNITIES TO PROTECT HABITAT, SLOW CLIMATE CHANGE

**WWF-Canada used the best available science and data to document how well Canada's ecosystems, wildlife habitats and natural carbon stores are (and are not) protected, and to then identify where new protected areas could provide maximum benefit for wildlife and for slowing climate change. We found that across Canada, major opportunities to protect habitat and combat climate change are being overlooked.**

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Habitat for at-risk species is not being protected:

- **84 per cent of physical habitats with high concentrations of at-risk species are inadequately or not at all protected.**

Across Canada we not protecting the wide variety of physical habitats that wildlife need:

- **76 per cent of physical habitats in Canada are inadequately or not at all protected.**

In particular, our protected areas do not safeguard critical species freshwater habitat including lakes, rivers and wetlands:

- **91 per cent of physical habitats do not have adequate protection of shorelines.**

Finally, the vast majority of Canada's carbon-rich habitats – those forests, peat bogs and soils that are storing significant amounts of carbon and preventing increased warming associated with climate change – have not yet been protected.

- **77 per cent of habitats with high densities of soil carbon are inadequately or not at all protected.**
- **74 per cent of habitats with high densities of forest biomass are inadequately or not at all protected.**

# WHAT GOOD PROTECTION LOOKS LIKE

Size isn't the only important factor when determining the value of a protected space. The following factors are assessed:

## Size and coverage

Large and continuous protected areas are the key ingredient for ensuring that physical habitats for wildlife are adequately protected. While many, smaller protected areas can still deliver important protections, the fragmentation between them can reduce their ultimate value for wildlife.

## Freshwater coverage

Protected areas shouldn't stop at the water's edge – freshwater ecosystems and wildlife extend beyond the shoreline.

## Diverse elevation levels

Different elevations provide different habitats, values and ecosystem services for wildlife.

## Intactness and connectivity

Wildlife must be able to move freely within a habitat as well as between different habitats without encountering roads or other types of development.

# WHAT NEEDS PROTECTING

**To maximize benefits for biodiversity and climate change* when deciding on new protected areas and incentives for protection, proposals should include one or more of the following:**

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## AT-RISK SPECIES

Areas targeted for protections should benefit vulnerable wildlife populations, including COSEWIC-assessed at-risk species.

## FOREST BIOMASS

Forests are exceptionally adept at capturing and sequestering carbon – and are readily available. Though they're not all created equal, and are in different states of carbon capture and release over time, they should be prioritized for protection as a nature-based solution to climate change that creates habitat for wildlife at the same time.

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## SOIL CARBON

Soil and peat bogs sequester carbon. Habitats with high levels of soil carbon should be prioritized for protection to ensure additional greenhouse gas emissions aren't released into the atmosphere through land conversion.

## CLIMATE REFUGES

In some areas, unique climate conditions are predicted to remain stable into the future and should be protected to provide especially important safe havens for wildlife threatened by climate change.

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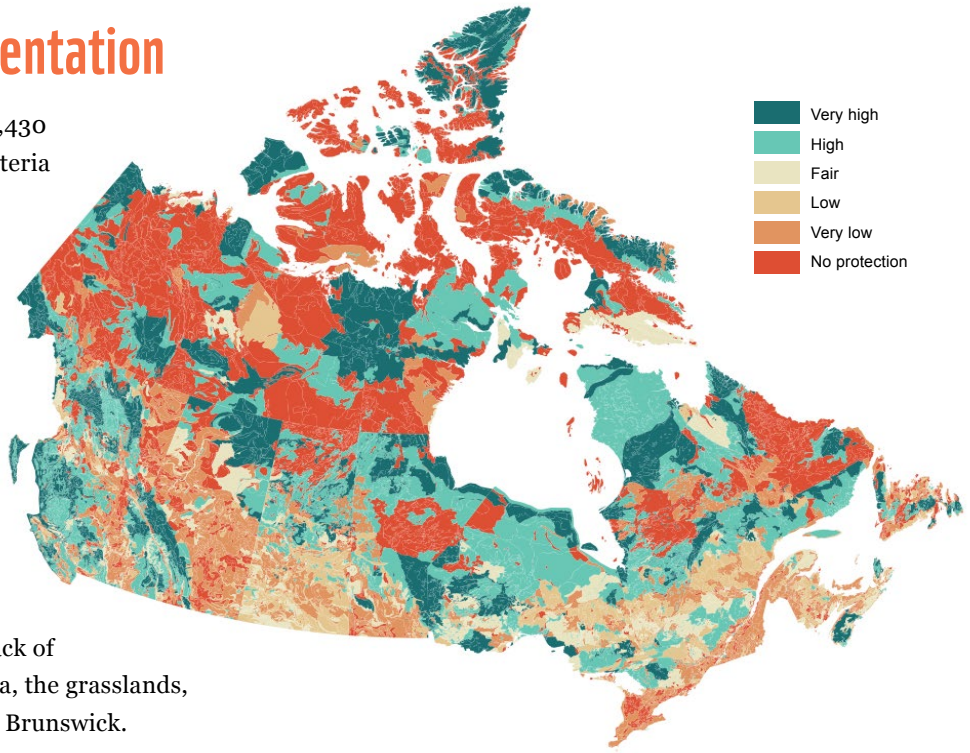
*This assessment focuses on both wildlife habitat needs and opportunities to slow climate change, which is a driver of wildlife loss. Protected areas provide important social and cultural benefits as well, and WWF-Canada is supportive of the creation of protected areas for these and other reasons. See Recommendations for more.

# A CLOSER LOOK AT HABITAT GAPS AND OPPORTUNITIES

**With 76 per cent of Canada's physical habitats inadequately or not at all protected, there are countless opportunities to close the gaps in the protected area network while benefitting wildlife and limiting climate change.**

## Overall ecological representation

The overall protection for each of Canada's 6,430 physical habitats was calculated using the criteria for ecological representation. Forty-five per cent of Canada's physical habitats have no protection, meaning they are not covered in any way by a protected area. On top of that, 31 per cent are inadequately represented, suggesting that the protected areas are small, disconnected and do not represent diverse habitats. Only 24 per cent of physical habitats in Canada are adequately represented within our protected areas network. The Northwest Territories, Nunavut and Newfoundland and Labrador have the least protection, while a lack of ecological representation is notable in Alberta, the grasslands, southern Ontario, southern Quebec and New Brunswick.




ltered on Calculation Total, which keeps 6 of 6 members.

Using all of these indicators, gaps can be identified in the current protected area network. For instance, the assessment found that:

- Canada's protected areas are not large enough to maintain biodiversity. **Only 19 per cent of Canada's physical habitats are adequate in meeting the recommended size requirements to support wildlife.**
- We are not protecting the free movement among large regions that allows animals to find food and mates. **Connectivity between 79 per cent of physical habitats is either inadequately or not at all protected.**
- We are not protecting freshwater ecosystems and wildlife with our current protected area network. **91 per cent of physical habitats do not have adequate protection of shorelines.**

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## AT-RISK SPECIES

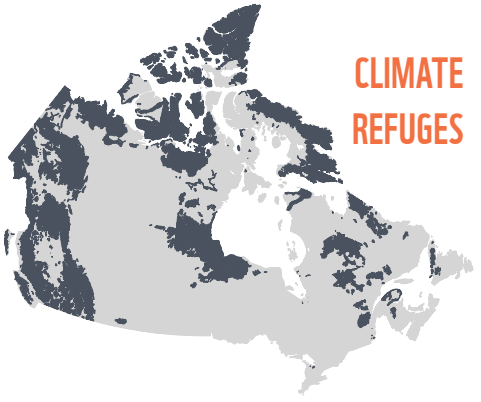
High-quality protections of essential habitat for at-risk species will be a key step to the recovery of vulnerable populations. Unfortunately, across the country, the physical habitats that are home to the most at-risk species are among the least adequately represented. High numbers of at-risk species are found in areas where there are many human pressures. These areas include the Okanagan in British Columbia, the grasslands in Southern Alberta, Saskatchewan and Manitoba, the Carolinian Zone in Ontario, and areas with high agricultural and urban activity in Quebec.

## FOREST BIOMASS

Forest biomass naturally captures and sequesters carbon. In Canada, forest biomass is very high in British Columbia, with moderate to high levels extended through the boreal forest to the Maritimes.

## SOIL CARBON

Protection of areas with high soil carbon sequestration potential is critical to ensure that we don't develop these areas and release additional greenhouse gas emissions. While high densities of soil carbon don't follow a specific pattern across Canada, soil carbon rich areas include Newfoundland and Labrador, Quebec, northern Ontario and between the Yukon to the Northwest Territories.



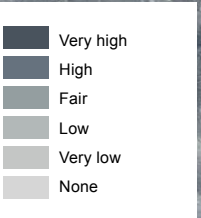
## CLIMATE REFUGES

Areas where unique climate conditions are to remain relatively stable are important for conservation. Species that are threatened by climate change can be supported in these regions. Many of these unique locations in Canada are likely to see changes in temperature and precipitation, but these areas should remain stable in the future. In Canada, most of the country's climate refuges can be found in British Columbia and Yukon, as well as the northern parts of Northwest Territories and Nunavut.

## HIGH PRIORITY CONSIDERATIONS

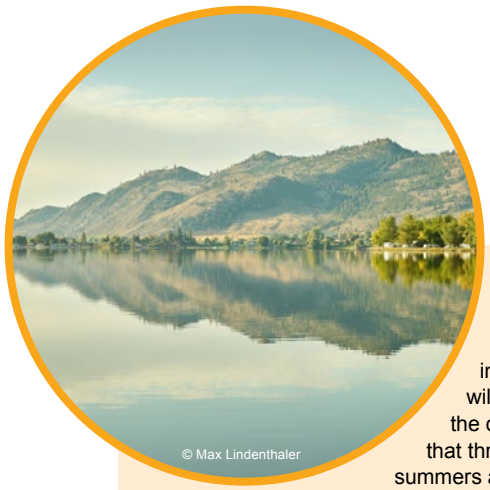
Canada is currently behind the international target of protecting 17 per cent of land and inland waters by 2020, and we have even further to go to achieve adequate ecological representation of habitats for wildlife. There are clearly significant gaps in Canada's protected area network. But which gaps should be closed first?

Unless protected area planning is coupled with a prioritization of areas that provide maximum conservation benefit, we will fail to meet our long-term goals to reverse the decline of wildlife and limit climate change.



# PRIORITY ZONES FOR NEW PROTECTED AREAS

**Some of Canada's least protected areas are the most important for at-risk species, climate adaptation and carbon storage. Based on this assessment, five regions in particular should be prioritized for protections.**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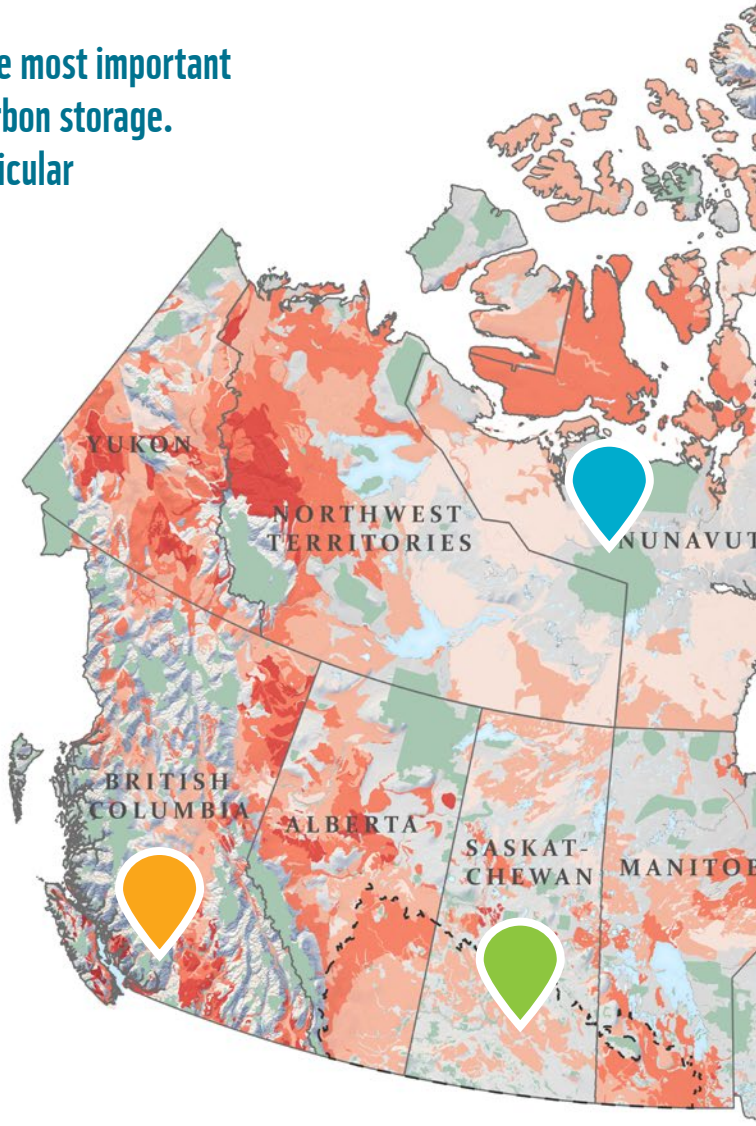
## OKANAGAN

British Columbia's southern interior is home to unique wildlife like the pallid bat and the desert nightsnake – species that thrive in the region's hot, dry summers and mild winters. The mix of grasslands, forest, desert-like areas and rich riparian ecosystems provides highly diverse habitats that host many of the province's at-risk species. Unfortunately, these habitats score poorly in our assessment of ecological representation. Expanding human population, and related road and housing infrastructure, and agriculture development have added pressure to the region where many stressed species have already been extirpated. In addition, the Okanagan is a species hotspot, and contains areas that have high levels of forest biomass and climate refuges.




## GRASSLANDS

Grasslands are considered one of the most threatened ecosystems in the world and for the most part are inadequately or not at all protected. They are home to some of the highest numbers of at-risk species in Canada, including the swift fox and Sprague's pipit. Over the last century, approximately 80 per cent of the prairie grassland region has been converted for intensive agricultural use. While protection of the grasslands is critical to reversing the decline of our most threatened species, other ecosystems within the prairie provinces contain high densities of soil carbon and forest biomass – which are vitally important to consider as we adopt nature-based solutions to climate change while simultaneously supporting biodiversity.

© Troy Fleece

## THE TERRITORIES

Grizzly bears, barren-ground caribou and wood bison call the Arctic tundra and taiga home. These mostly unprotected habitats range from mountains to valleys, and include Great Slave Lake, the deepest lake in North America, and major free-flowing rivers including the Mackenzie and Liard rivers. The territories have the highest proportion of unprotected physical habitats in the country while facing increasing disturbance from climate change and resource extraction. Yukon extending into the Northwest Territories has high levels of soil carbon and forest biomass, and important climate refuges. It is also is home to high numbers of at-risk species.

## SAINT JOHN RIVER WATERSHED

New Brunswick has the second poorest ecological representation score in Canada, with only one per cent of physical habitats adequately protected. The Saint John River – or Wolastoq – winds across the province as a maze of blind bays, tributaries, lakes and marshlands, providing essential habitat to at-risk wood turtles and shortnose sturgeon. In addition to being home to many at-risk species, some areas of the region contain significant soil and forest biomass carbon stores, and climate refuges. These values, combined with increasing human pressures on the landscape, makes this region a priority for protection.

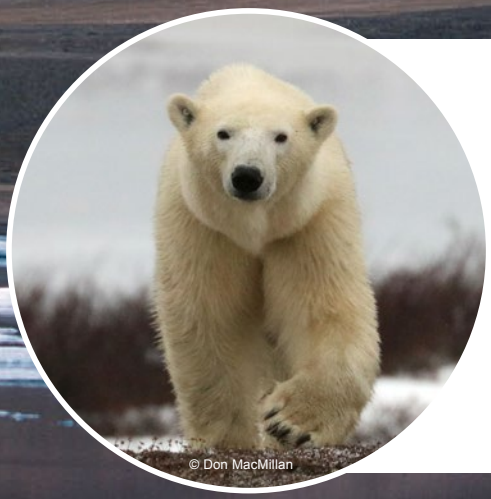
## SOUTHERN ONTARIO & QUEBEC

Southern Ontario and Quebec are highly developed for urban and agricultural needs. Nearly the entire region is either unprotected or very poorly protected, and it is also home to high densities of at-risk species, like the snapping turtle and Jefferson salamander. Increasing privatization of land means that large, intact and connected protected areas are more difficult to implement, which means complimentary conservation options, like habitat restoration, may be necessary to give wildlife the protection they need. In addition to being a hotspot for at-risk species, the region contains some climate refuges – a critical element for species at the northern periphery of their range. Southern Quebec specifically boasts high densities of soil carbon and fair levels of forest biomass.

# PROTECTING HABITAT TO PROTECT WILDLIFE

To make space for Canada's wildlife to survive and recover, and for the absorption of carbon from the atmosphere, we need to ensure a full range of physical habitats and ecosystems have high-quality protections, beginning with those types of areas that are currently the least protected in Canada and that have the highest combination of our high-priority considerations.

## To ensure new protected areas have maximum benefit for wildlife and nature, we need to:



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### FOCUS ON HABITAT for at-risk or vulnerable species

Canada's goal to protect 17 per cent of land and inland waters is just one of our commitments under the international Convention on Biological Diversity. It is not simply a quantitative target. Our commitment is to conserving areas that are of particular importance to biodiversity and ecosystem services and ensuring that these areas are conserved through ecologically represented and well-connected networks of protected areas. The primary goal of protected areas is to improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity. Yet many of Canada's protected areas do not benefit the vast majority of habitats for high concentrations of species at risk. To meet the purpose of the goal, rather than simply reaching a quantitative target, it is essential that governments prioritize the needs of wildlife alongside area-based targets when creating new protected areas.

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### EXTEND PROTECTIONS to include lakes, rivers and wetlands

Despite Canada's international commitments to protect inland waters, shoreline and stream habitats are considerably underrepresented in Canada's current protected area network. With approximately 20 per cent of the world's total freshwater resources and with Canadian freshwater wildlife like reptiles and amphibians experiencing population declines of 34 per cent on average over the past 40 years, it is critical that we ensure these resources and habitats are well-protected.

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## SAFEGUARD AREAS with high carbon storage potential to slow climate change while providing habitat

Canada is warming at twice the global rate. By safeguarding areas with high forest biomass, we can help to limit the amount of greenhouse gases emitted through logging and development. Similarly, protecting areas of high soil carbon is critical to ensure that we don't release additional greenhouse gas emissions through land conversion and development. Given the biodiversity and climate crises, we need to ask more of our protected areas. It's essential we prioritize protection in the spaces wildlife need, and in those areas that will provide nature-based solutions to help us reach our climate change goals.

© Mark Hobson

## SET RESTRICTIONS within protected areas to maintain the integrity and value of the space

Protected areas vary in their degree of protection for wildlife. Some are strictly protected to safeguard biodiversity and geological features while restricting human activity. Others permit a greater human footprint with resource extraction or high visitation rates for recreational purposes. While these areas with higher footprint may still provide some protections for wildlife, our most vulnerable species need new protected areas with a high degree of quality and intactness.

For habitats in southern Canada, where high landscape fragmentation means that large, uninterrupted protected areas are increasingly difficult to achieve, we may need to consider other high-standard conservation measures, including on private lands, to provide important connectivity. In addition, habitat restoration, planting of native species and habitat-friendly development can all play an important role.

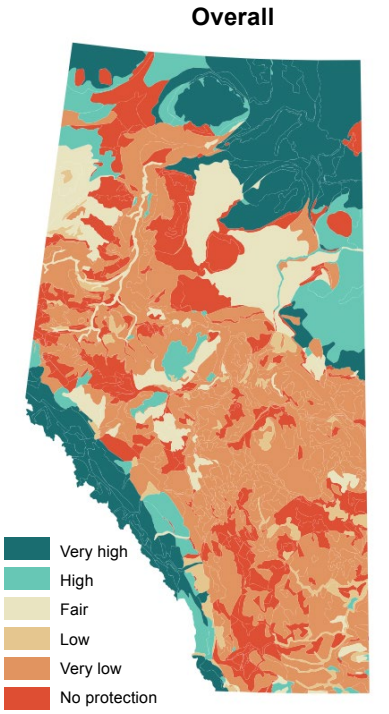
**Finally, while WWF-Canada's *Wildlife Protection Assessment: A National Habitat Crisis* focuses on the needs of wildlife with the goal of reducing wildlife decline, it is important to recognize that protected areas can be critical for biodiversity conservation, ecosystem services (like carbon storage) and cultural and social values. Both Indigenous Protected and Conserved Areas and Inuit Protected and Managed Areas – like the newly announced Edéhzhíe protected area and Tallurutiup Imanga– can be critical for conserving ecological integrity as well as cultural heritage. WWF-Canada is supportive of the creation of protected areas for biodiversity conservation, ecosystem services and cultural values.**

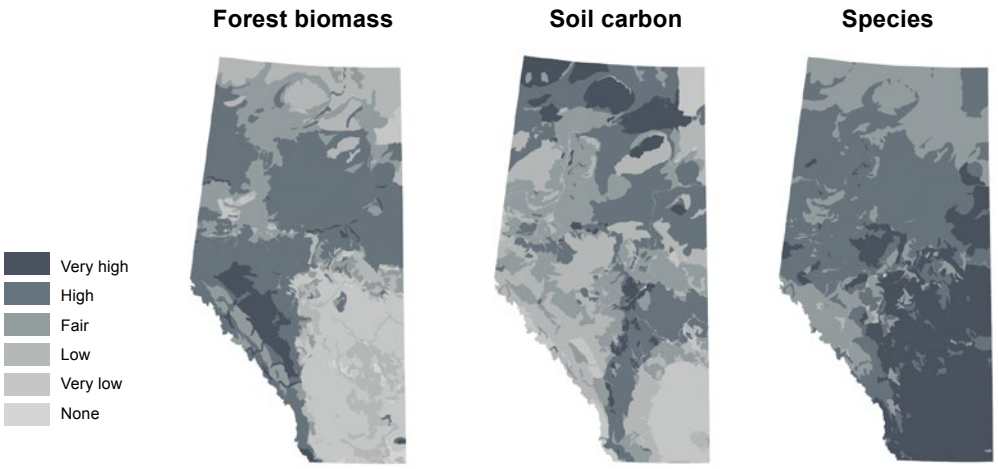
# ALBERTA

© John E. Marriott / All Canada Photos

**Despite protecting large areas in the northeast and southwest of the province, Alberta has largely overlooked protections for grasslands – the area that is home to the largest number of at-risk species in the province**

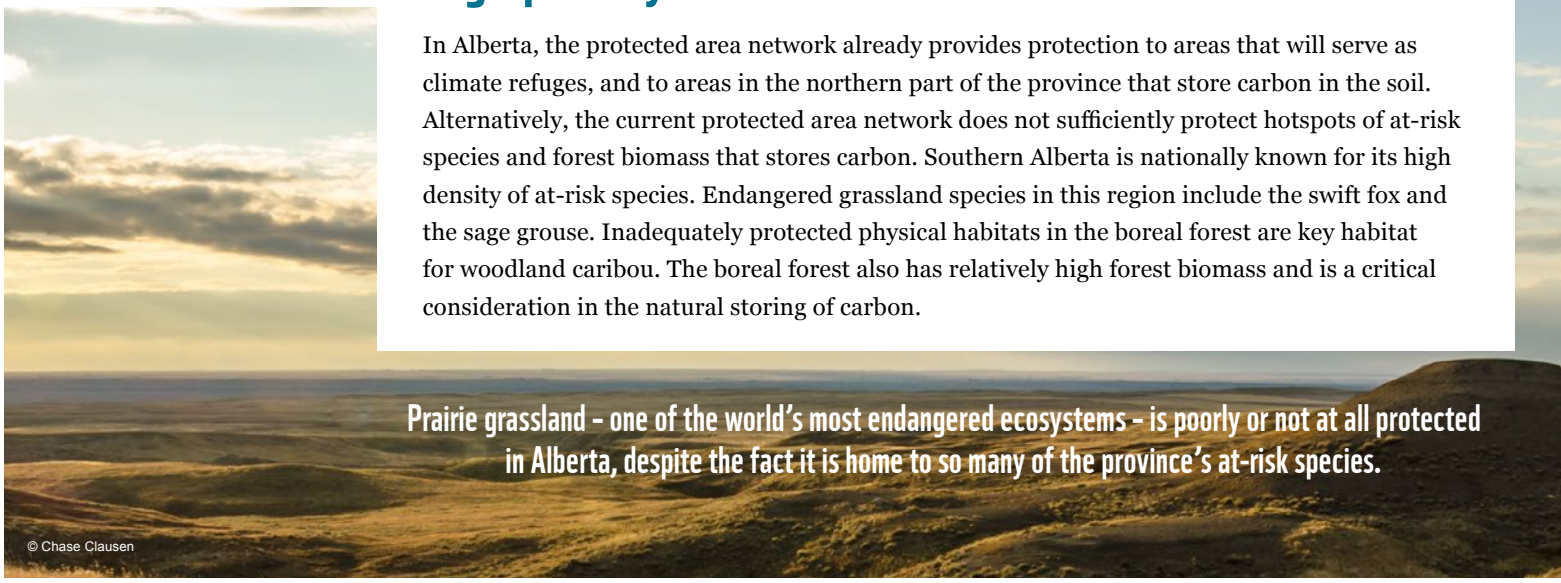
Alberta is an excellent example of how a region can achieve area-based protection targets while failing to protect areas that are essential to supporting and recovering wildlife that are at risk of extinction. Nearly the entire grassland ecosystem of Alberta is considered a priority region for the establishment of new protected areas, largely due to the high prevalence of at-risk species. Alberta's existing protected areas are heavily restricted to the Rocky Mountains and northeastern parts of the province.




## High priority considerations

In Alberta, the protected area network already provides protection to areas that will serve as climate refuges, and to areas in the northern part of the province that store carbon in the soil. Alternatively, the current protected area network does not sufficiently protect hotspots of at-risk species and forest biomass that stores carbon. Southern Alberta is nationally known for its high density of at-risk species. Endangered grassland species in this region include the swift fox and the sage grouse. Inadequately protected physical habitats in the boreal forest are key habitat for woodland caribou. The boreal forest also has relatively high forest biomass and is a critical consideration in the natural storing of carbon.



**Prairie grassland – one of the world's most endangered ecosystems – is poorly or not at all protected in Alberta, despite the fact it is home to so many of the province's at-risk species.**

© Chase Clausen

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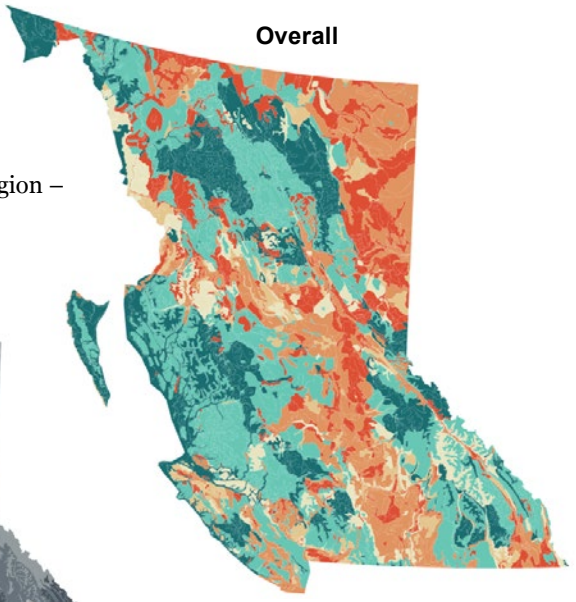
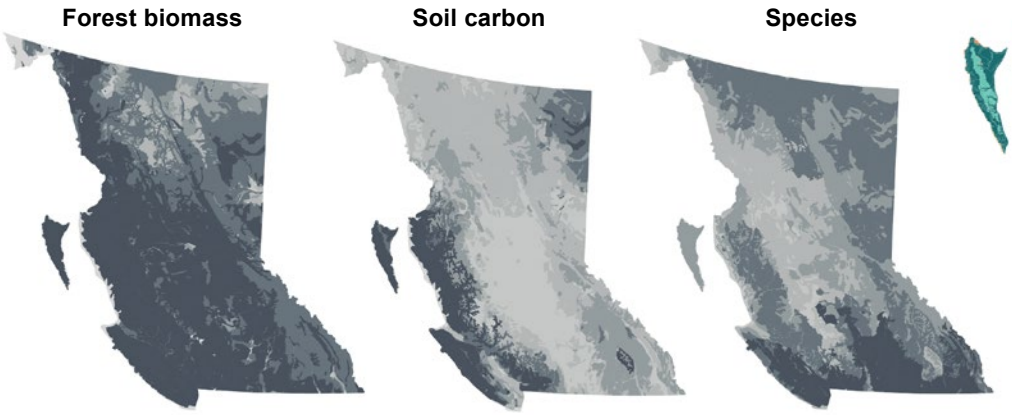
# BRITISH COLUMBIA

**Despite leading other jurisdictions in area-based targets and ecological representation, British Columbia has not adequately protected the region where most of the province's at-risk species live**

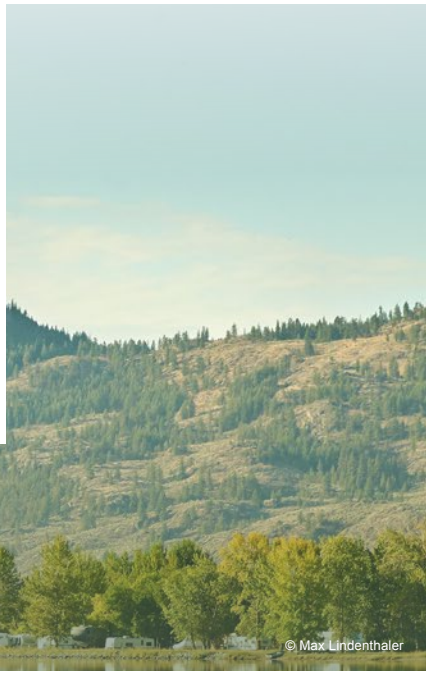
British Columbia serves as an example of how carefully protected area planning can and should be applied. The province is a leader in both area-based targets and ecological representation. Gwaii Haanas National Park Reserve and Heritage Site and the Great Bear Rainforest – home to the Kermode Bear – are both well-represented within the province's protected area network. However, there are still key zones – such as climate refuges and the Okanagan region – that should be prioritized to safeguard wildlife both now and in the future.




## High priority considerations

While British Columbia is among the leading jurisdictions when it comes to size, coverage and ecological representation of its protected area network, there are still key habitats that are not being adequately protected. Southern British Columbia, particularly the Okanagan region provides habitat to a variety of at-risk species. A unique mix of grasslands, forests, rugged terrain and riparian and wetland ecosystems provide habitat to at-risk species such as the pallid bat and desert nightsnake. Moreover, the province is home to some of Canada's most significant climate refuges, giving it an important role in safeguarding biodiversity now and in the future.



**Though the Okanagan is home to many at-risk species – like the pallid bat and desert nightsnake – expanding development has added even more pressure to habitats that are either inadequately or not at all protected.**

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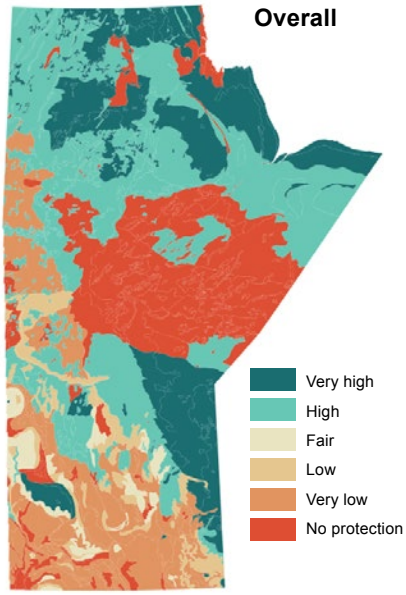
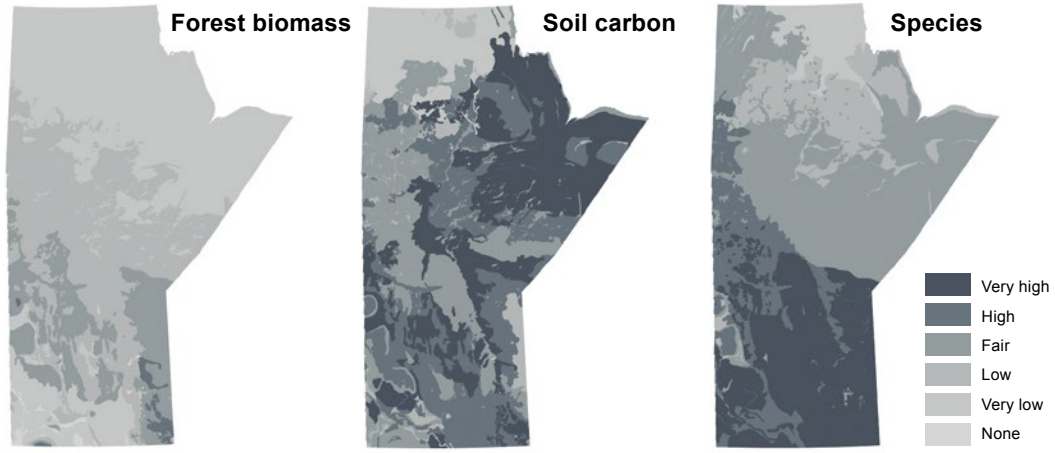
# MANITOBA

**Manitoba lags behind other provinces in the creation of protected areas. Large protected areas in the boreal and grassland regions of the province would strengthen ecological representation and benefit at-risk wildlife**




Manitoba has a large and continuous unprotected area that is visible at both the national and provincial level. Centrally located in the eastern portion of the province, this area should be prioritized for protection. In addition, the grassland region of Manitoba is poorly represented within the province's protected area network despite being home to overlapping high priority considerations. This region should likewise be prioritized for protected area establishment. On a positive note, as large parks, Caribou River Provincial Park and Wapusk National Park protect a variety of plant and animal species including caribou and contribute to adequate representation for many criteria in this analysis.




## High priority considerations

The gap in protections in the central-east portion of the province is particularly concerning given that the area borders important climate refuges and contains large soil carbon stores. Improvement of ecological representation of protected areas should also be prioritized in the grassland region, a habitat to many Canadian at-risk species.

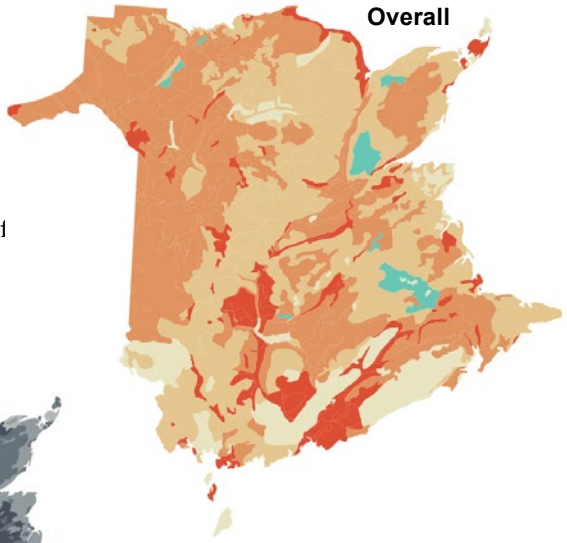
**Manitoba's swath of unprotected boreal forest is home to woodland caribou, wolverine and other at-risk species, and also contains high soil carbon and ecologically important rivers, lakes and wetlands.**

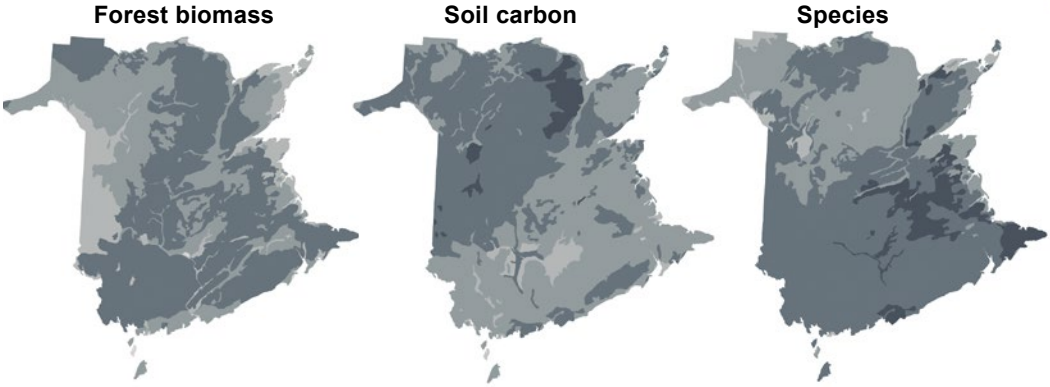
© Kean Moynihan WWF

# NEW BRUNSWICK

**Considering New Brunswick has one of the worst provincial scores on ecological representation and poorly protected physical habitats with high climate refuge and carbon storage value, the province could create incredible benefits for wildlife and climate change with new, strategic protected areas**

New Brunswick has the second poorest ecological representation scores among the provinces, with only one per cent of physical habitats adequately protected. This is partially due to the low per cent of area protected in the province – just five per cent of land is protected. The Wolastoq, also known as the Saint John River watershed, is of particular concern within the province, given that nearly all of the physical habitats within the watershed are inadequately protected not protected at all. While the northern portion of the watershed contains climate ref and high densities of soil carbon, the lower portion contains high densities of forest biomass and habitat for a greater number of at-risk species.




## High priority considerations

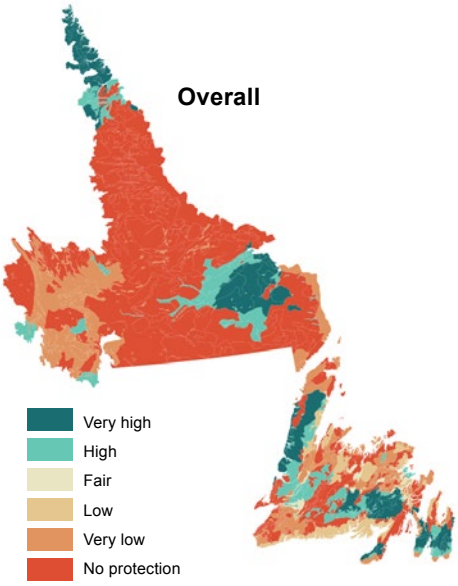
In New Brunswick, high concentrations of forest biomass and at-risk species are found in the south and east of the province, while soil carbon and climate refuges are prevalent in the northwest. New Brunswick also has a large zone designated as a future climate refuge. While well-protected sites such as the Nepisiguit Protected National Area generally fall within the climate refuge, the northern portion of the province could benefit from the establishment of new protected areas – including corridors that would connect them to existing and new protected areas in the south.

**Human pressures on the Wolastoq are adding stress to this watershed that is home to nearly 200 species of breeding birds, and over 100 species of reptiles, amphibians, fish and mammals, including the Threatened wood turtle.**

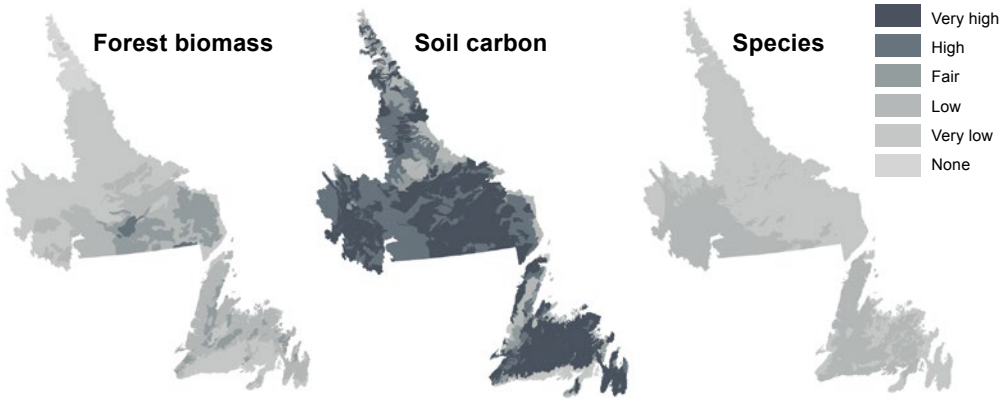
© Shutterstock

With few protections in place for wildlife, and the highest carbon densities of all the provinces, new protections could help biodiversity and play an important role in sequestering carbon

# NEWFOUNDLAND AND LABRADOR

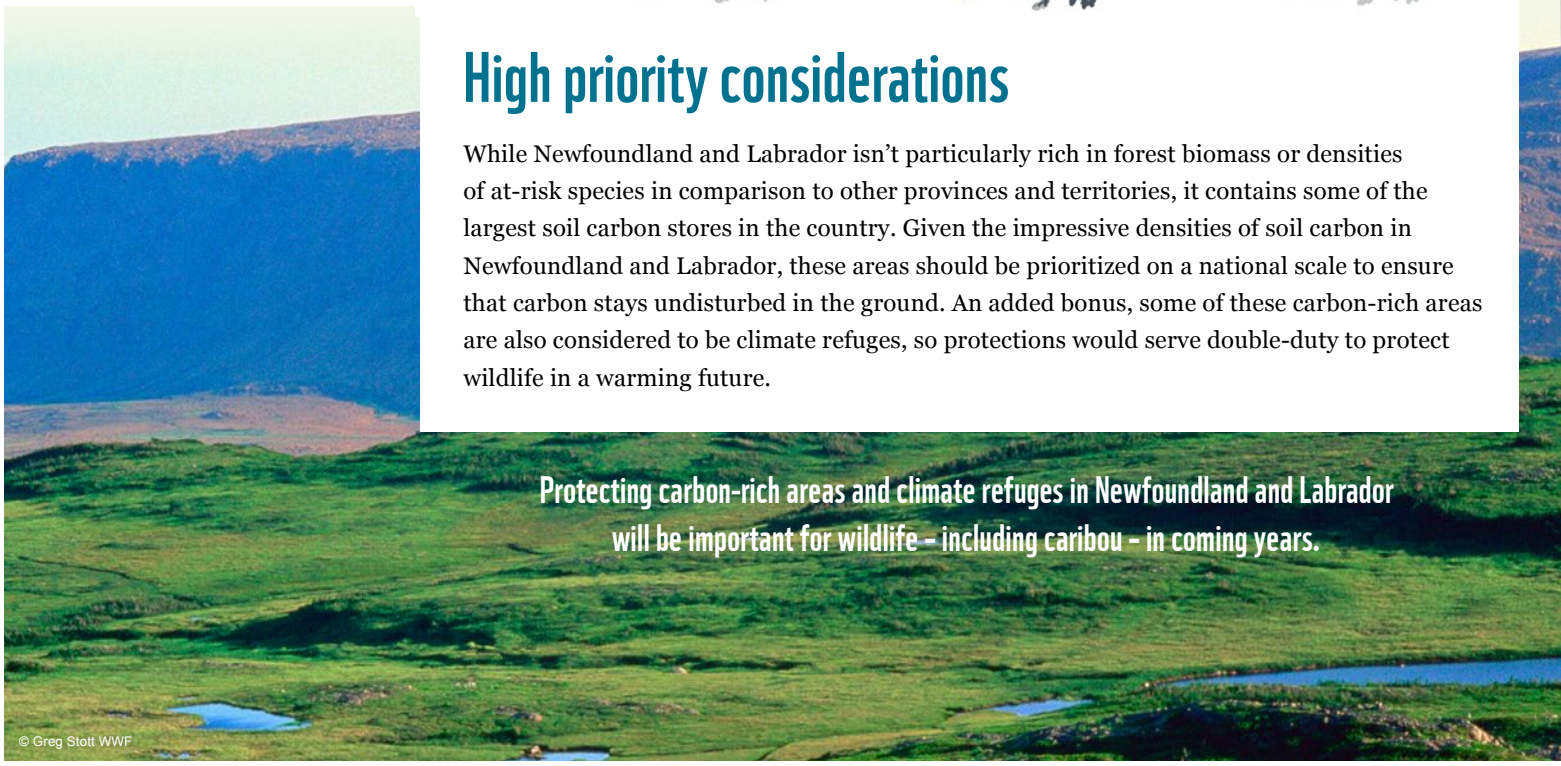



Newfoundland and Labrador has few protections in place for wildlife. A large majority of the landmass currently remains unprotected with very few parks located in Labrador. The province is an important one for carbon sequestration: Newfoundland and Labrador are very high in soil carbon. Additionally, climate refuges can be found in both regions. Protection of these carbon stocks and climate refuges will keep these climate change mitigating areas safe from human pressures and prevent increased carbon emissions associated with development.




## High priority considerations

While Newfoundland and Labrador isn't particularly rich in forest biomass or densities of at-risk species in comparison to other provinces and territories, it contains some of the largest soil carbon stores in the country. Given the impressive densities of soil carbon in Newfoundland and Labrador, these areas should be prioritized on a national scale to ensure that carbon stays undisturbed in the ground. An added bonus, some of these carbon-rich areas are also considered to be climate refuges, so protections would serve double-duty to protect wildlife in a warming future.



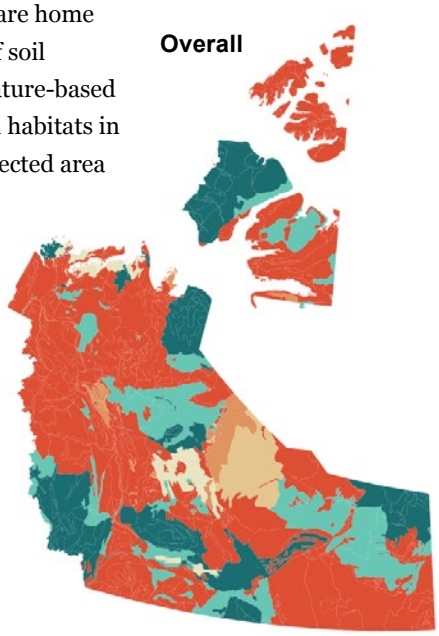

Protecting carbon-rich areas and climate refuges in Newfoundland and Labrador will be important for wildlife – including caribou – in coming years.

© Canoe North Adventures

Large protected areas in the Northwest Territories are among the best in the country when it comes to protecting enclosed habitats and wildlife. However, 73 per cent of habitats in the territory are completely unprotected

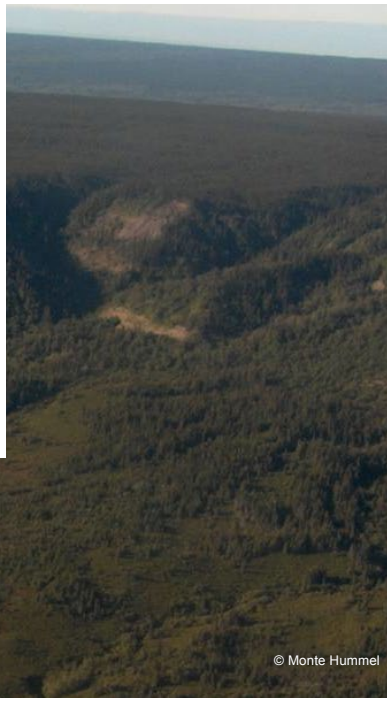
# NORTHWEST TERRITORIES

The Northwest Territories' rich and wide-ranging habitats, from forests to wetlands to tundra, are home to iconic and Threatened species like the barren-ground caribou and wood bison. High levels of soil carbon storage and climate refuges makes the Northwest Territories an important region for nature-based solutions to climate change. Yet despite a few large protected areas, the majority of the physical habitats in the Northwest Territories are unprotected. In October 2018, Canada's first Indigenous-led protected area was announced – the Edehzhie Protected Area. The Dehcho Dene First Nation has been a long-time advocate for the importance of protecting the region which has significantly improved the connectivity and shoreline coverage of the territories' protected area network.



## High priority considerations

The Northwest Territories' at-risk species are densely concentrated in the southwest portion of the territory, overlapping with key adjoining climate refuges. In Canada, climate refuges are concentrated in the north, and the northern perimeter and islands of Northwest Territories is no exception. There are also large carbon stores in the western half of the territory, with the highest densities occurring in regions with no protected areas. For these reasons, much of the Northwest Territories is considered a national priority for the designation of new protected areas.

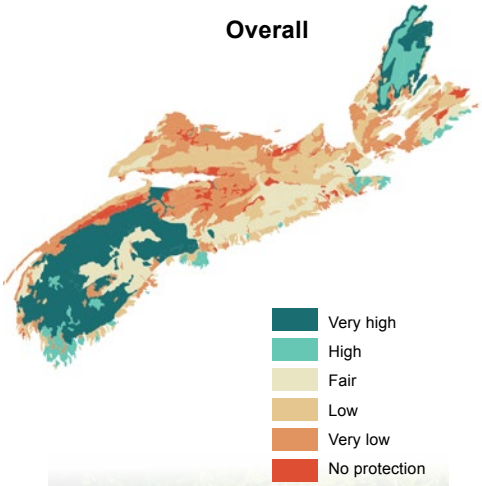


In the newly announced Edehzhie protected area, important habitats for woodland caribou, wood bison and migratory birds are protected in the traditional territory of the Dehcho Dene First Nation.

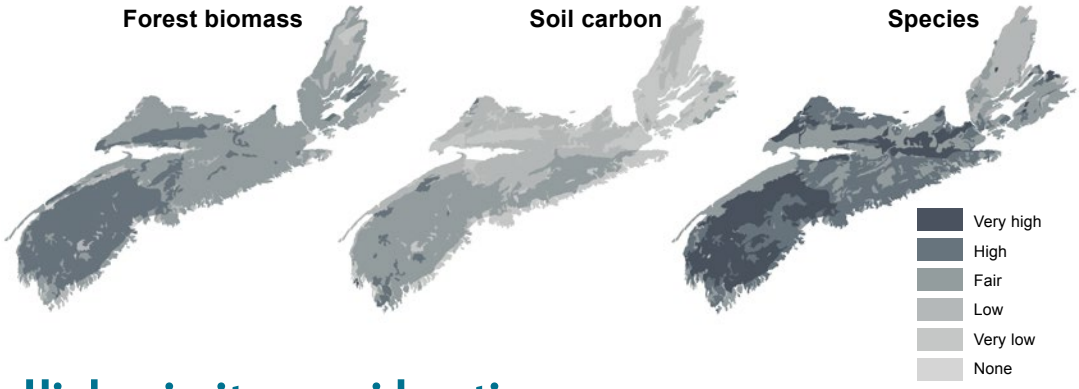
© Monte Hummel

Although Nova Scotia is close to meeting its provincial protected area targets, 88 per cent of physical habitats are inadequately or not at all protected

# NOVA SCOTIA

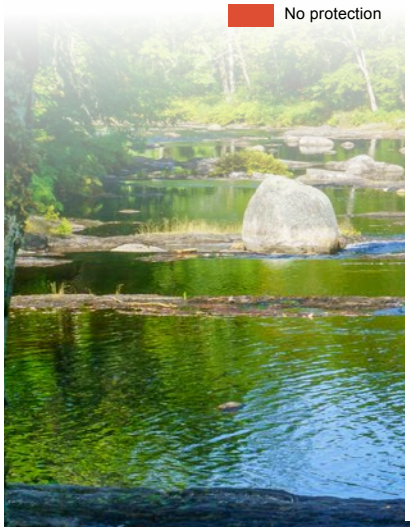



Nova Scotia has a diversity of land and seascapes, providing habitats for a variety of wildlife. Although the province has done a good job of protecting areas of highest priority for species-at-risk habitat, overall it gets a low score on ecological representation as many habitats are inadequately protected.




## High priority considerations

The southern half of the province, which contains some of the highest densities of at-risk species, is generally adequately protected. Within Nova Scotia, this area also contains some of the greatest forest biomass, and moderate levels of soil carbon. Nova Scotia has zero physical habitats that are considered climate refuges. Despite the lack of high priority considerations in the province, high quality protected areas will still be critical to supporting wildlife that live there. As the province moves forward in achieving protection targets, the coastal lands bordering the Bay of Fundy should be prioritized due to very poor ecological representation, while existing protected areas in the central zone of the province should be enhanced.



Though Kejimkujik National Park in southwestern Nova Scotia protects a high density of at-risk species and contains high levels of forest biomass, making it a good example of a well-placed park, the province overall is among the worst in the country for overall ecological representation.

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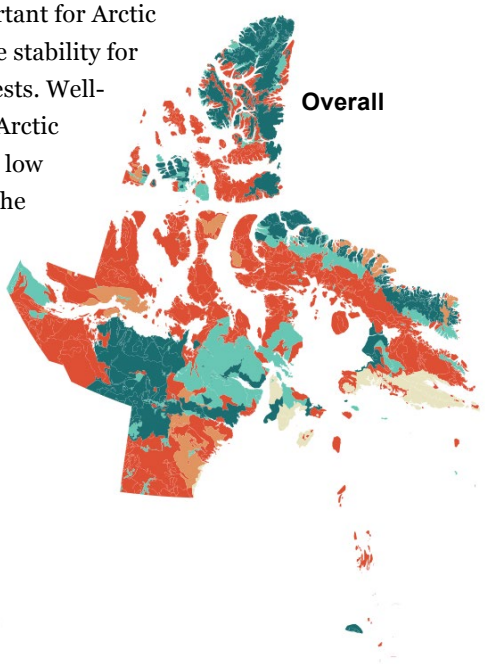
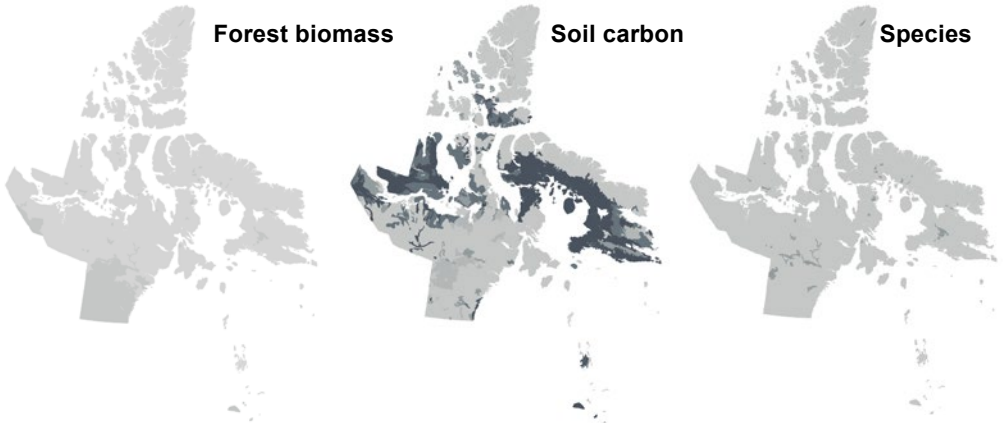
**While much of Nunavut is unprotected, the existing protected areas are high-quality and well-positioned. More protections will address unprotected physical habitats, ensuring the ability of wildlife to move between habitats, and provide much-needed stability as the climate changes**

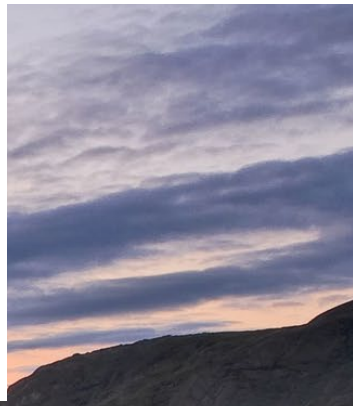
# NUNAVUT

The Arctic environment of Nunavut is a unique habitat in Canada. This vast territory is important for Arctic species, including the declining populations of barren-ground caribou. Areas that will provide stability for wildlife as the climate changes face competing demands from mining and development interests. Well-planned and new protected areas in Nunavut should manage these conflicts by safeguarding Arctic habitats and wildlife for the future. Existing protected areas in Nunavut need help, too. Their low scores in shoreline and stream habitats signal that insufficient protection may be inhibiting the recovery of freshwater-dependent species. To address gaps, a more cohesive and connected protected network could be built through the Nunavut Land Use Plan, which will provide significant benefits to wildlife.




Given the harsh Arctic conditions, the territory is not a national hotspot for forest biomass or at-risk species. However, the territory does hold large stores of soil carbon, especially high in the coastal areas of the Northwest Passage – an area generally classified with no protection or inadequate ecological representation. Most importantly, much of the territory is predicted to be a climate refuge – meaning that Nunavut, along with the Yukon and Northwest Territories, has a disproportionate responsibility to conserve habitats that will support wildlife into the future as the climate changes.

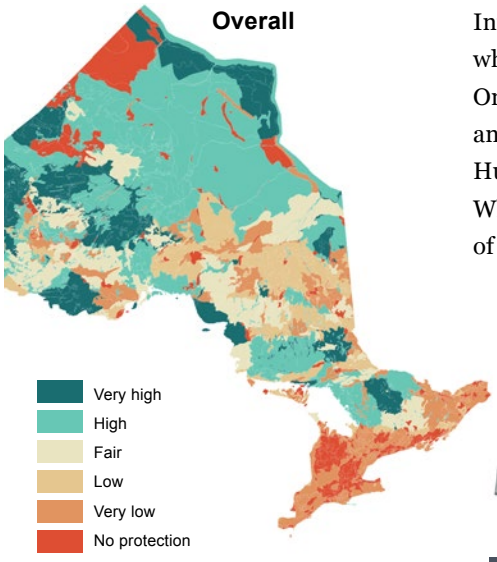


**The Boothia Peninsula - Aviqtuuq in Inuktitut - on the northern shores of mainland Nunavut is an area of thriving biodiversity and a priority region for Inuit. The site is an important calving ground for the Ahiak barren-ground caribou herd which makes potential mining exploration especially concerning.**

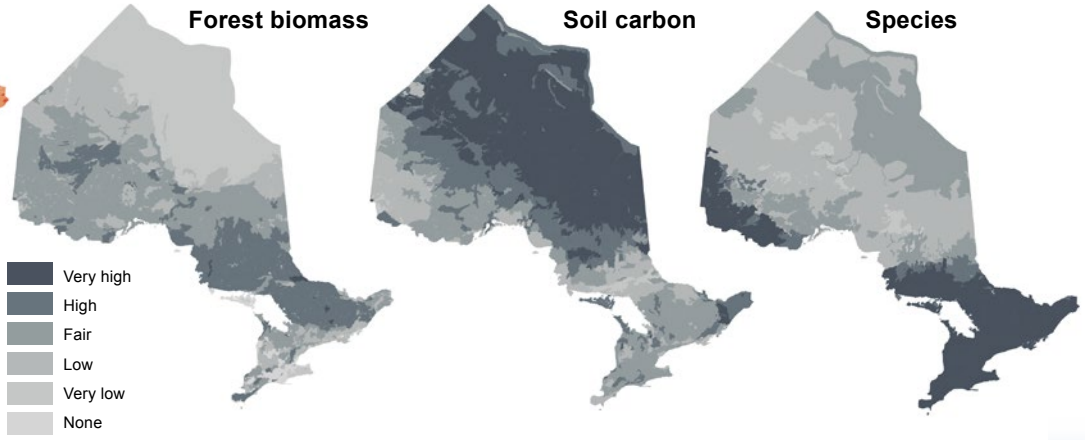
© Andrew S. Wright

While many of the habitats in Ontario have some level of protection, to stop wildlife loss protections must be prioritized for areas that are home to an abundance of species at risk

# ONTARIO




Intensive human activity has led to large numbers of at-risk species in southern Ontario, where small, unconnected sites inadequately protect threatened wildlife. In northern Ontario, where soils and wetlands store high amounts of carbon, areas with high soil carbon and climate refuges are lacking protection. Ontario's Polar Bear Provincial Park, alongside Hudson's Bay, is well-sited with adequate size, connectivity and protection of shorelines. While being an area important to an iconic Canadian species, the park is also protecting areas of high soil carbon.




## High priority considerations

Southern Ontario is one of the greatest hotspots of at-risk species in Canada, as well as home to over a third of the Canadian population. Currently, this area has either no protection or very poor ecological representation of physical habitats within the current protected area network. Given the diversity of species in this area and the level of stress they face from development, it is critical that we make sure the physical habitats that support them are protected. While the south of the province is a top priority for wildlife, the north contains substantial soil carbon stores and climate refuges that are largely inadequately represented in the protected areas network to date.

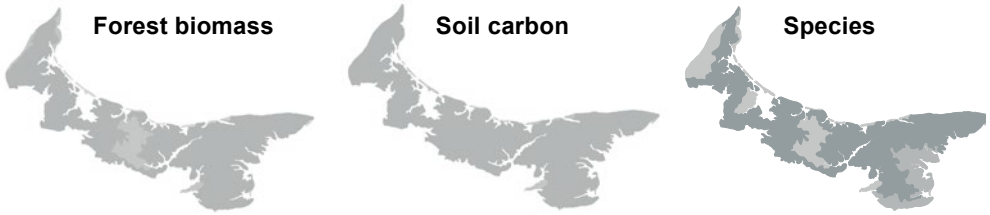
Because increasing development and privatization of land in Southern Ontario makes large, intact and connected protected areas difficult to establish, other effective conservation measures are needed to create habitat for at-risk species.

© Frank Parhizgar

# PRINCE EDWARD ISLAND

Only three per cent of Prince Edward Island is protected

Approximately 88 per cent of Prince Edward Island is privately owned – a challenge when trying to create meaningful habitat protections. Interestingly, 90 per cent of physical habitats found on Prince Edward Island have a protected area, yet they are all considered inadequately protected. The entire province of Prince Edward Island is considered a priority for protection given that none of the physical habitats have achieved adequate representation. Protection measures could be established through protected areas on public lands or more likely through formal agreements on private lands.




## High priority considerations

Prince Edward Island has no climate refuges, and only low levels of soil carbon, forest biomass and at-risk species. This does not mean that the area should not be protected, but there may be other areas in Canada that should be prioritized to provide greater benefit to species, ecosystems and carbon storage.

**Given the high proportion of private land ownership in PEI, other effective conservation measures –biodiversity-friendly agreements with land owners – can help create wildlife habitat, in addition to habitat restoration and planting of native species.**

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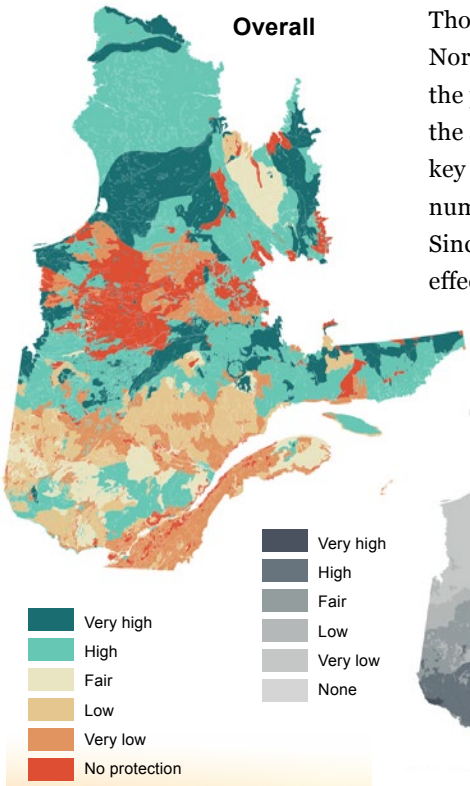
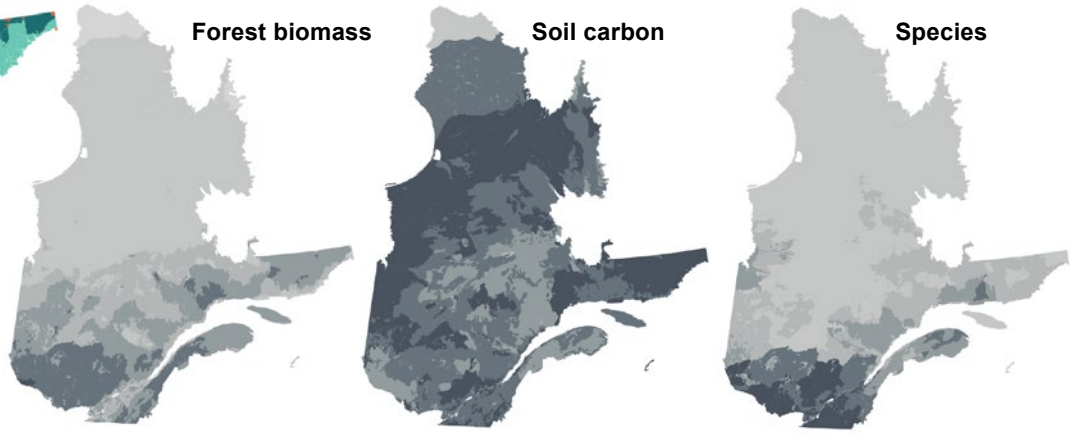
With large areas in northern Quebec having the potential to remain stable under climate change, new protected areas must be well-connected to create corridors for species migrations

# QUEBEC

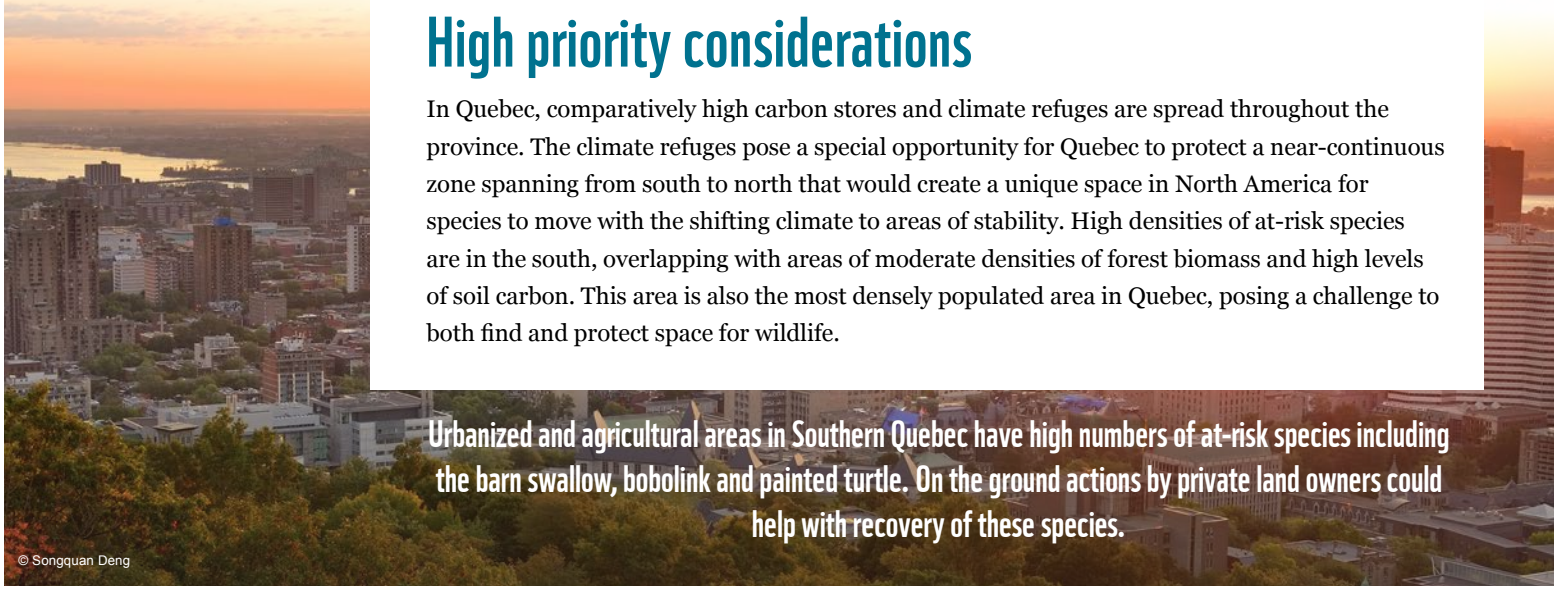



Though Quebec is filled with many small protected areas, there is a clear gap in connectivity. Northern Quebec has high amounts of soil carbon and climate refuges, but a large gap in the protected areas network does not allow for connectivity between different regions. In the south, areas around the St. Lawrence River are a priority given the four overlapping key considerations: high carbon storage in soils, forest biomass, climate refuges, and high numbers of at-risk species. This region is heavily stressed by agriculture and urbanization. Since land in this southern region is predominantly privately-owned, protection through other effective conservation measures is necessary to safeguard wildlife.




## High priority considerations

In Quebec, comparatively high carbon stores and climate refuges are spread throughout the province. The climate refuges pose a special opportunity for Quebec to protect a near-continuous zone spanning from south to north that would create a unique space in North America for species to move with the shifting climate to areas of stability. High densities of at-risk species are in the south, overlapping with areas of moderate densities of forest biomass and high levels of soil carbon. This area is also the most densely populated area in Quebec, posing a challenge to both find and protect space for wildlife.



Urbanized and agricultural areas in Southern Quebec have high numbers of at-risk species including the barn swallow, bobolink and painted turtle. On the ground actions by private land owners could help with recovery of these species.

© Songquan Deng

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# SASKATCHEWAN

**Though 78 per cent of physical habitats have some form of protection in Saskatchewan, only 17 per cent are adequately protected, impacting their value for wildlife**

Widespread loss and deterioration of grassland habitat has threatened the many species that rely on grassland ecosystems. While Saskatchewan has many small protected areas scattered throughout the southern portion of the province that enhance its ecological representation, these protected areas lack connectivity and are not sufficiently large to ensure that biodiversity can thrive. Native prairie grasslands are one of the most threatened terrestrial ecosystems in the world and these regions should be prioritized for landscape-scale protection. In addition to habitat loss, at-risk grassland species suffer from habitat degradation via the intensification of agricultural operations and application of pesticides.

**Overall**

**Forest biomass**

**Soil carbon**

**Species**

## High priority considerations

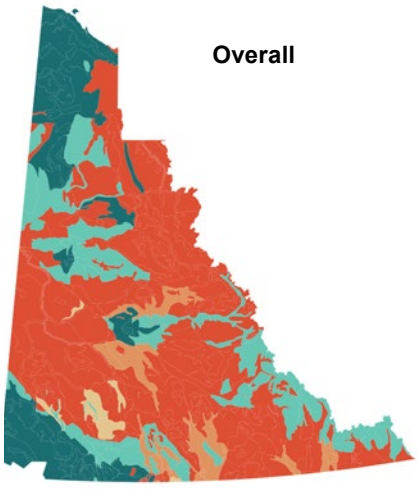
Southern Saskatchewan is one the largest hotspots of at-risk species nationally. Though this predominantly grassland region isn't particularly rich in soil carbon or forest biomass, the high density of at-risk species cannot be ignored. Enhanced protections in the corridor cutting across central Saskatchewan would safeguard important carbon stores of soil and forest biomass in the region.

**Southern Saskatchewan's scattered and small protected areas provide good coverage but lack connectivity and are not sufficiently large to effectively support grasslands wildlife like the Sprague's Pipit.**

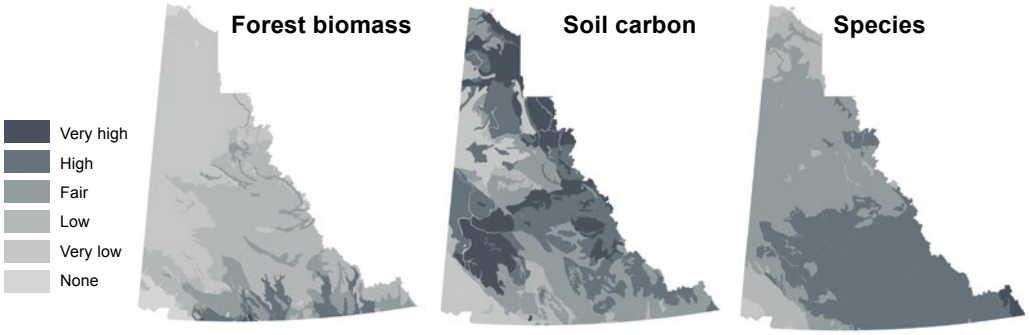
© James Gabber

# YUKON

**With nearly the entire territory a potential climate refuge, protected areas in Yukon should be prioritized on a national scale**




With boreal forests, tundra environments and wild and free-flowing rivers, Yukon habitats support wildlife like the at-risk grizzly bear and collared pika. Ecological representation in the region is a story of extremes. Where areas are protected, they are of high quality and provide good coverage of physical habitats. But the territory also has among the highest proportion of unprotected physical habitats in the country. The significant gaps in Yukon's protected area network happen to be among the most important for nature-based solutions and climate stability and therefore should be a national priority. Importantly, Yukon supports Canada's longest wild and free flowing river – the Liard. Wild rivers are free-flowing waters that are not negatively impacted by pollution, habitat fragmentation, overuse of water or climate change. Despite their pristine nature, Yukon's wild rivers remain unprotected from future development or human pressures.




## High priority considerations

Yukon has a significant opportunity to safeguard biodiversity as climate change shifts species distributions northward and to higher elevations. Nearly the entire territory is a potential climate refuge – which suggests Canada should be prioritizing protected area designation in Yukon on a national scale. Currently there are no protected areas in the physical habitats with the greatest number of at-risk species in Yukon – an area which also contains the territory's greatest density of forest biomass. And Yukon holds relatively higher densities of soil carbon throughout the territory than other provinces and territories – largely in areas lacking protection. The presence of all of these criteria means new protected areas in Yukon will be critical for protecting wildlife and mitigating climate change.

The Liard River is one of the longest free-flowing rivers in Canada. With a high number of species at risk, high densities of soil carbon, and potential as a climate refuge, the Liard and surrounding watershed are a priority area for protection in Yukon.