

# MCGILL UNIVERSITY

## BIODIVERSITY PLAN 2030



DÉVELOPPEMENT  
DURABLE  
MCGILL  
SUSTAINABILITY



McGill



Photo by Monica Allaby

In **McGill's Climate & Sustainability Strategy 2020-2025**, one of the commitments is to create a plan for campus biodiversity that emphasizes native, adaptive, and edible species. The current Biodiversity Plan stems from this commitment.

## JULY 2023

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Prepared by the McGill Office of Sustainability

In collaboration with Prof. Andy Gonzalez, Liber Ero Chair in Conservation Biology, and members of the Bieler School of Environment, Campus Planning & Development, Department of Biology, Department of Buildings & Grounds, Department of Natural Resource Sciences, Department of Plant Science, Design Services, Gault Nature Reserve, Office of Science Outreach, Procurement Services, Quebec Centre for Biodiversity Science, Redpath Museum, and Redpath Museum Society.

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The plan acknowledges that the campuses are located on land which has long served as a site of meeting and exchange amongst Indigenous peoples, including the Haudenosaunee and Anishinaabeg. It is the intention of the plan to honour, recognize, and respect these nations, particularly the Kanien'kehà:ka, as the traditional stewards of the lands and waters on which the campuses are located.



Photo by Siddhi Aubeeluck

## THE CASE FOR ACTION

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Biodiversity, short for “biological diversity”, is the variety of life on earth, from ecosystems to species to genes. Biodiversity plays many functions, including the provision of numerous **contributions to people**—or **ecosystem services**—such as food, fuel, medicine, energy, recreation and tourism, and purification of air and water. Yet, global biodiversity is declining, with species going extinct tens to hundreds of times faster than the average rate over the last 10 million years.<sup>1</sup> In Canada, there are currently 2,253 species that may be at risk of extinction.<sup>2</sup> The key drivers of biodiversity loss are habitat loss and degradation, invasive species, overexploitation, climate change, and pollution.

Mitigating these drivers of biodiversity loss has become increasingly urgent. As biodiversity loss is locally dependent—in other words, the composite effect of many local changes—action to protect biodiversity starts at home. With more than 2,000 ha of land (see map on page 8), world-class scientific expertise, whole units dedicated to landscape architecture, campus planning, and groundskeeping, and existing commitments to act on climate change, McGill has many opportunities to help create a thriving natural environment for our community and beyond.

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**Nature’s contributions to people:** “All the contributions, both positive and negative, of living nature to the quality of life for people. Beneficial contributions include food provision, water purification, flood control, and artistic inspiration, whereas detrimental contributions include disease transmission and predation that damages people or their assets.” (Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, IPBES)

**Ecosystem services:** “The benefits people obtain from ecosystems, divided into supporting, regulating, provisioning, and cultural benefits.” (IPBES)



A student at McGill's information booth at the 2022 UN Biodiversity Conference in Montreal.

**DID YOU KNOW?**

Biodiversity loss and climate change are intricately linked. At 2°C of global warming, risks to biodiversity will be severe and irreversible.<sup>3</sup> Meanwhile, biodiversity can be protected through nature-based solutions to climate change and by supporting species adapted to changing climate conditions.

## JOINING GLOBAL LEADERS

In December 2022, representatives from 188 governments gathered at the United Nations Biodiversity Conference (COP15) in Montreal to discuss common goals to guide global action on biodiversity loss and restore natural ecosystems. The event concluded with the landmark adoption of the Kunming-Montreal Global Biodiversity Framework, which includes global commitments to increase the area of natural ecosystems by 2050, halt species extinctions due to human activities, and protect nature's contributions to people.

Joining leading higher education institutions around the world, McGill signed the Nature Positive Pledge in November 2022 to become a founding university on a nature positive journey. Led by the University of Oxford, the pledge involves four steps, namely, to assess the university's biodiversity baseline, adopt smart targets for biodiversity, set actions to achieve them, and report annually on progress. This document, McGill's first Biodiversity Plan, will guide the University's efforts in the coming years.



Photo by Tom Kingsbury

## GUIDING PRINCIPLES

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McGill's Biodiversity Plan is founded on the following principles:

### **EVIDENCE-BASED**

Plans and actions are based on scientific evidence, traditional knowledge, and groundskeepers' and gardeners' expertise, using FAIR<sup>4</sup> and CARE<sup>5</sup> principles for knowledge generation and data-sharing.

### **COLLABORATIVE**

Engaging processes are put in place for students, staff, faculty, alumni, and the public across McGill's properties.

### **CLIMATE-RELEVANT**

Biodiversity actions that support climate change mitigation and adaptation are favoured, whenever possible.

### **SOCIALLY SIGNIFICANT**

Nature's contributions to people and the improvement of well-being are linked to thriving biodiversity.



Photo by Jason Plunshu

## VISION & OBJECTIVES

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McGill aims to monitor, protect, and enhance biodiversity via our research, teaching, and operations, while raising awareness and engaging community members both on and beyond our campuses.

To achieve this vision, McGill has identified **six key objectives** to pursue, as well as corresponding actions. These objectives are highly interconnected and mutually reinforcing.



Photo by Alex Tran

## 01

### **Create and maintain inventories of biodiversity across McGill's properties.**

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#### **KEY ACTIVITY**

Develop an internal digital repository and public-facing living atlas of campus biodiversity.

#### **COMPLEMENTARY ACTIVITY**

Integrate monitoring of campus biodiversity in undergraduate and graduate field and applied research courses.

## 02

### **Analyze and report on McGill's biodiversity impacts.**

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#### **KEY ACTIVITY**

Estimate McGill's biodiversity footprint – an assessment of the quantitative impact of an organization's activities on biodiversity, such as number of local species lost or impacted, or area of habitat degraded or restored.

## 03

### **Increase McGillians' engagement in biodiversity-focused educational and research activities.**

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#### **KEY ACTIVITY**

Conduct bioblitzes open to students, staff, faculty, and the public on all three campuses.

#### **COMPLEMENTARY ACTIVITY**

Develop engagement activities such as workshops, walking tours, group planting activities, competitions, etc.



## 04

### Embed biodiversity best practices in University operations.

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#### KEY ACTIVITY

Develop a differentiated management plan (*plan de gestion différenciée*) to map out landscape management practices.

## 05

### Increase the quality and quantity of green spaces on our campuses.

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#### KEY ACTIVITY

Develop landscape initiatives intended to advance biodiversity objectives, such as planting species that provide multiple services and/or establishing rainwater retention gardens, pollinator meadows, ecological corridors, green roofs, etc.

## 06

### Develop strategic partnerships to help meet biodiversity targets.

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#### KEY ACTIVITY

Partner with local, regional, national, and/or international organizations on collaborative projects to increase the integrity, connectivity, and resilience of ecosystems.



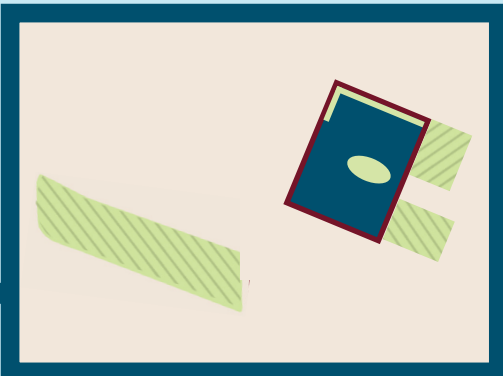
A SNAPSHOT OF

# BIODIVERSITY AT MCGILL

*McGill manages 2,254 hectares of land where biodiversity can be fostered and supported.*

- McGill properties
- McGill green spaces
- McGill agricultural lands
- Nearby green spaces
- Nearby agricultural lands

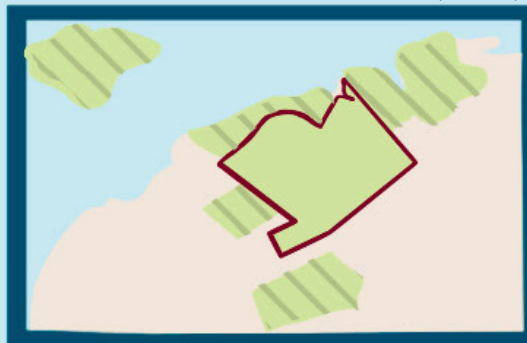
OUTAOUAIS CAMPUS (<1 HA)



MACDONALD CAMPUS AND THE MORGAN ARBORETUM (867 HA)



MOLSON RESERVE (51 HA)



GAULT NATURE RESERVE (1,080 HA)



DOWNTOWN CAMPUS (255 HA)



**NOTE:** McGill University also owns the Bellairs Research Institute in Barbados, the McGill Arctic Research Station, and the McGill Sub-Arctic Research Station, all of which have unique ecosystems and biodiversity.



# DOWNTOWN CAMPUS

The Downtown Campus is part of the Mount Royal Heritage Site. It has 180 documented tree species, including native trees such as the American beech, American elm, paper birch, red, silver, and sugar maple, staghorn sumac, and endangered butternut.

The campus has 11 urban gardens, including three pollinator gardens with native, medicinal, and edible plants. The Redpath Museum, Quebec's only natural history museum, serves as a repository for specimens collected by McGill researchers and houses extensive collections of plants and animals that preserve snapshots of our biodiversity.



# MACDONALD CAMPUS

The Macdonald Campus in Ste-Anne-de-Bellevue is the largest greenspace on the Island of Montreal and the largest private landholding in the region. Home to the Faculty of Agricultural and Environmental Sciences, its lands include a 205-hectare teaching and experimental farm that produces field crops, vegetables, fruits, dairy, and poultry.

The campus has numerous pollinator gardens, nesting bee habitats, rewilded spaces, and a migratory bird corridor. It hosts the McGill Bird Observatory, which has recorded over 225 bird species and nesting populations of the threatened bobolink and chimney swift; the McGill University Herbarium, which documents plant biodiversity globally; and the Lyman Entomological Museum, Canada's second largest collection of insects.

Photo by Kelsey Litwin



# GAULT NATURE RESERVE

McGill's Gault Nature Reserve in Mont-Saint-Hilaire is a UNESCO Biosphere Reserve and migratory bird refuge made up of about 1,000 ha of protected old-growth forest.

It is home to 613 species of vascular plants; over 200 bird species, including the formerly endangered peregrine falcon; 800 butterfly species; 212 moss species; 54 lichen species; several reptile and amphibian species with fragile populations; and numerous rare species in danger of disappearing, as designated by the Committee on the Status of Endangered Wildlife in Canada.

The Gault Nature Reserve also manages the Wilder & Helen Penfield Nature Conservatory on Lake Memphrémagog, which includes a wet lab and is adjacent to about 100 ha of forest.

Photo by Alex Tran



# FOREST RESERVES

## **Morgan Arboretum**

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McGill owns and manages a 245-ha forest reserve, the Morgan Arboretum, home to 30 mammal species, 15 reptile and amphibian species, and over 200 migratory and overwintering bird species. A diversity of forest stands, including old-growth forest and old plantations, fields, swamps, and vernal ponds are found here.

Located at the Macdonald Campus, the Arboretum is part of Montreal's Grand parc de l'Ouest and adjacent to the Forêt-de-Senneville Nature Reserve and the Senneville Migratory Bird Sanctuary.

## **Molson Reserve**

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The Molson Reserve is a 51-ha nature reserve located close to the Macdonald Campus and owned and managed by McGill for use in study and research. It consists of forest, marshes, swamps, and vernal pools that provide a diversity of habitats for wildlife and plant species.

A complete vascular plant survey made from 1998–2000 reflects the reserve's very high diversity: 514 species, including 67 species that currently have a provincial-level rarity status, i.e., two critically imperiled, six imperiled, and 59 vulnerable species.

# IN DANGER OF DISAPPEARING



Photo by André Rouleau

**EASTERN WOOD-PEWEE**  
(*Contopus virens*)

Status: Special concern  
Morgan Arboretum

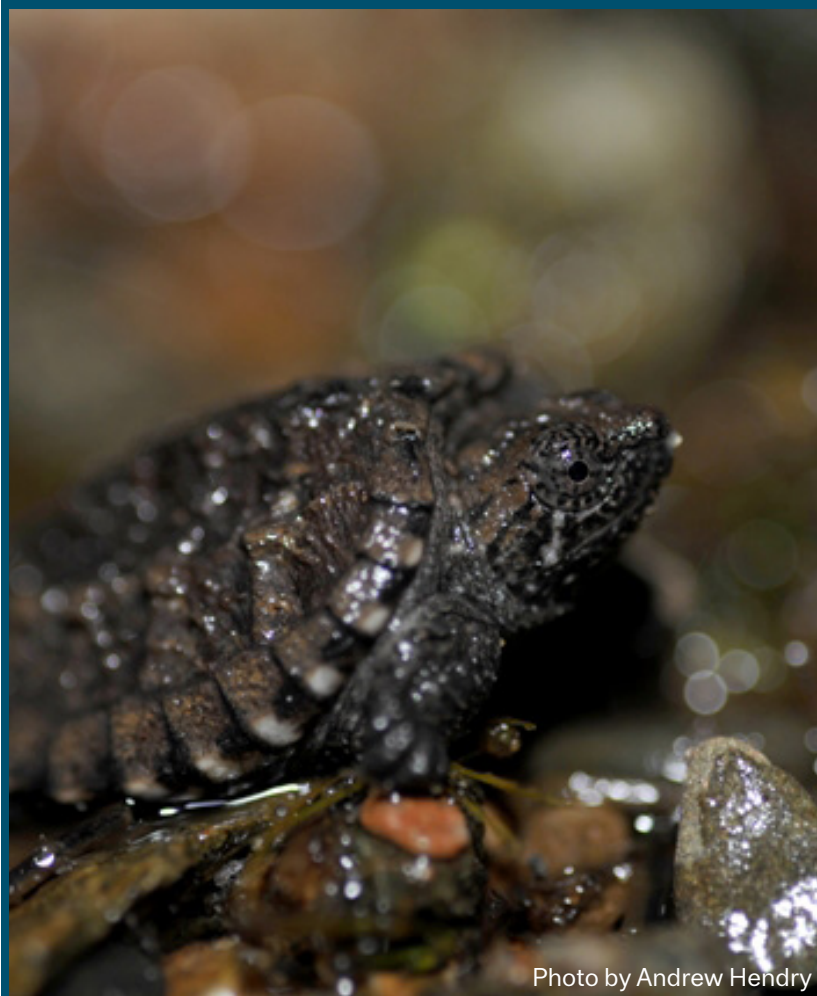


Photo by Andrew Hendry

**SNAPPING TURTLE**  
(*Chelydra serpentina*)

Status: Special concern  
Gault Nature Reserve



**BUTTERNUT**  
(*Juglans cinerea*)

Status: Endangered  
Downtown Campus



## GROUPS & ACTIVITIES SUPPORTING BIODIVERSITY AT MCGILL

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McGill boasts numerous groups and activities that support biodiversity, ranging from research networks to staff and student clubs to organized workshops and events. Recognizing the importance of collaboration, McGill also partners with various external organizations. Examples are listed below.

### Research Networks

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Quebec Centre for Biodiversity Science (QCBS)  
Group on Earth Observations Biodiversity Observation Network (GEO BON)  
McGill Bird Observatory

### Clubs & Societies

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Macdonald Student Ecological Garden (MSEG)  
McGill Staff Birding Club  
McGill Staff Garden Program  
McGill Students' Birding Club  
McGill Students for Wildlife Conservation  
Parks Canada Campus Club

### Workshops & Events

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Morgan Arboretum annual amphibian count  
Redpath Museum Society gardening student meetings and workshops  
Office of Science Outreach nature workshops, activities, and walking tours

### Partnerships & Collaborations

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Les amis de la montagne Community of Practice  
Canadian Migration Monitoring Network of bird observatories  
John Abbott College pollinator and migratory bird habitats

# EXAMPLES OF BIODIVERSITY INITIATIVES AT MCGILL



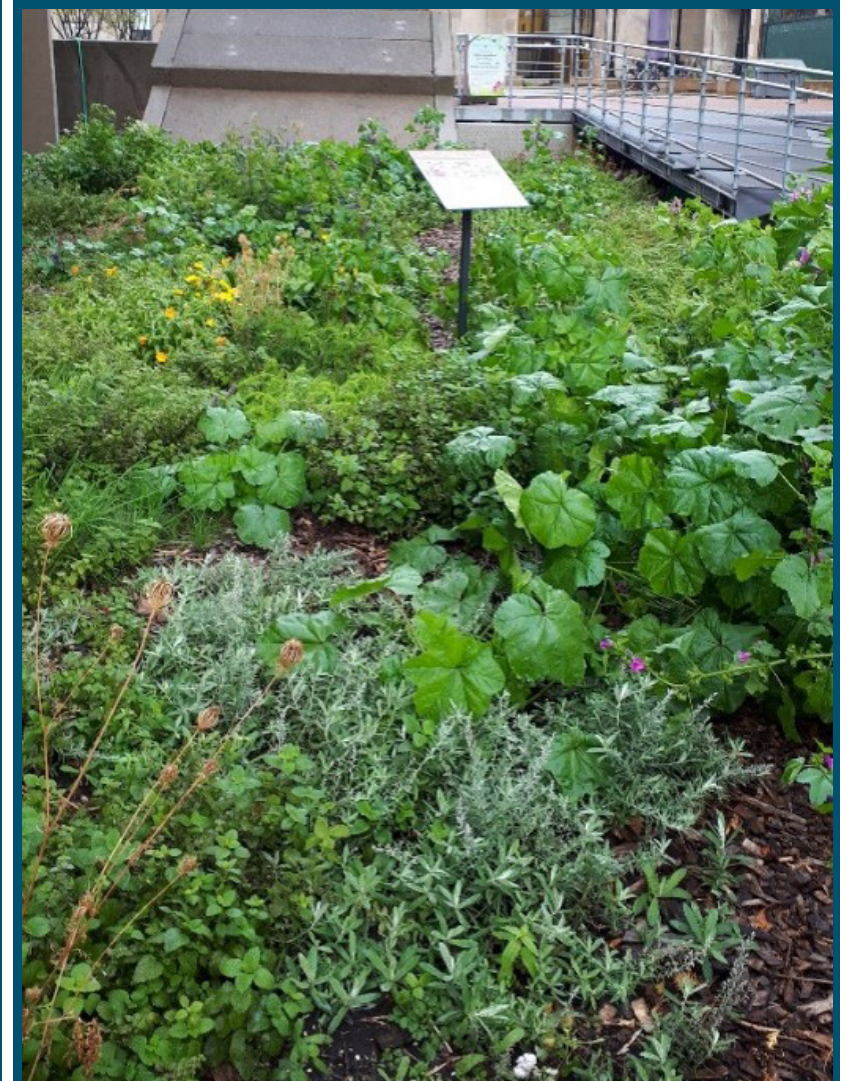
Photo by Caroline Begg

Butterfly and pollinator gardens at the Macdonald Campus



Photo by Alex Tran

Species monitoring activities at the Gault Nature Reserve



Medicinal and Indigenous plant garden near Burnside Hall on the Downtown Campus





This map depicts the potential to connect biodiversity between Mount Royal, the Downtown Campus, and greenspaces in Montreal, including the planned redesign of McGill College Avenue (in hatched green).

## MCGILL'S ROLE IN CONNECTING BIODIVERSITY ACROSS LANDSCAPES

Connecting or “**defragmenting**” landscapes helps support biodiversity by allowing the movement and dispersal of species. McGill can play a role in creating such **ecological corridors** that connect the natural features of its campuses with new greenspaces and regenerated natural habitats along circulation routes. These corridors could both maximize and better connect green spaces on our campuses, one of the aims of our Master Plan, and link biodiversity on our campuses with that of surrounding areas.

Being on the Mount Royal Heritage Site offers McGill unique opportunities to optimize biodiversity. In collaboration with the Ville-Marie borough, McTavish Street was pedestrianized and greened in 2010 to link biodiversity at the Downtown Campus with that of the mountain. Additionally, McGill will build a new public gateway to Mount Royal via its revitalization of a portion of the former Royal Victoria Hospital site. This project will extend the Promenade Fleuve-Montagne that connects downtown to the mountain thanks to the reintegration of green spaces and natural features.

**Defragmentation:** Reconnecting small, isolated patches of landscapes.

**Ecological corridor:** “A geographically defined area which allows species to move between landscapes, ecosystems and habitats... intended to ensure the maintenance of biodiversity and ecological and evolutionary processes.” (Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, IPBES)



Photo by Alex Tran

## PLAN IMPLEMENTATION

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This plan, and particularly the six objectives outlined above, will provide the overall orientation for biodiversity actions at McGill through 2030. To implement the actions in this plan, a working committee with faculty, staff, and students will be established. This committee will:

- Ensure that key stakeholders remain **engaged**
- Prioritize and enable **progress** on actions
- Identify **milestones** towards achieving our objectives
- Provide **accountability** on monitoring and reporting activities

Overall coordination of the plan implementation will be led by the McGill Office of Sustainability.

Funding to implement the actions listed in the plan will be solicited from the Sustainability Projects Fund, as well as other available sources. Progress towards objectives will be reported annually as part of the Climate and Sustainability Annual Report and regularly shared with the McGill community and external stakeholders.



Photo by Ben Joppke

## CRAFTING THE PLAN

This plan was developed from July 2022 to July 2023 in a participatory process led by the Office of Sustainability, in collaboration with Prof. Andy Gonzalez, Liber Ero Chair in Conservation Biology and Founding Director of the Quebec Centre for Biodiversity Science. Stakeholder consultations—including workshops, one-on-one discussions, presentations, and collaborative drafting and revisions—were held with staff, faculty, and students from 15 academic and administrative units, offices, and departments.

### REPRESENTATIVES FROM THE FOLLOWING GROUPS CONTRIBUTED TO THE BIODIVERSITY PLAN:

Bieler School of Environment  
Campus Planning & Development  
Department of Biology  
Department of Buildings & Grounds  
Department of Natural Resource Sciences  
Department of Plant Science (McGill University Herbarium)  
Design Services  
Gault Nature Reserve  
New Vic Project  
Office of Science Outreach  
Procurement Services  
Quebec Centre for Biodiversity Science (McGill members)  
Redpath Museum  
Redpath Museum Society  
Utilities & Energy Management



Photo by Dominique St-Pierre

**NOTE:** Unless otherwise stated, all the photographs included in this plan were taken on McGill campuses or lands.

<sup>1</sup>IPBES. 2019. Global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. E. S. Brondizio, J. Settele, S. Díaz, and H. T. Ngo (editors). IPBES secretariat, Bonn, Germany. 1148 pages. <https://doi.org/10.5281/zenodo.3831673>

<sup>2</sup>Canadian Endangered Species Conservation Council. 2022. Wild Species 2020: The General Status of Species in Canada. National General Status Working Group: 172 pp. [https://wildlife-species.canada.ca/species-risk-registry/virtual\\_sara/files/reports/Wild%20Species%202020.pdf](https://wildlife-species.canada.ca/species-risk-registry/virtual_sara/files/reports/Wild%20Species%202020.pdf)

<sup>3</sup>IPCC. 2021. Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Masson-Delmotte, V., P. Zhai, A. Pirani, S.L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M.I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J.B.R. Matthews, T.K. Maycock, T. Waterfield, O. Yelekçi, R. Yu, and B. Zhou (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, In press, doi:10.1017/9781009157896.

<sup>4</sup>Wilkinson, M.D., et al. 2016. The FAIR Guiding Principles for scientific data management and stewardship. Scientific Data 3, 160018. <https://www.nature.com/articles/sdata201618>

<sup>5</sup>CARE Principles for Indigenous Data Governance. <https://www.gida-global.org/care>