Canada's Sixth National Report to the United Nations Convention on Biological Diversity

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Section I. Information on the targets being pursued at the national level

☒ My country has adopted national biodiversity targets or equivalent commitments in line with the Strategic Plan for Biodiversity 2011-2020 and the Aichi Targets

☐ My country has not adopted national biodiversity targets and is reporting progress using the Aichi Biodiversity Targets for reference. (Move to section II. In section III, the Aichi Biodiversity Targets should be used for the purpose of this report as the national targets and progress should be assessed towards their achievement in the national context.)

Canada Target 1. By 2020, at least 17 percent of terrestrial areas and inland water, and 10 percent of coastal and marine areas, are conserved through networks of protected areas and other effective area-based conservation measures.

Rationale for the national target

Canada's natural spaces are a vital component of Canadian culture, heritage, economy and future, and they are of global importance. Canada's forests, wetlands, prairies, tundra, and oceans provide essential ecosystem services that support human life and well-being in many ways, including sustaining important cultural and spiritual connections with nature. Canada hosts approximately 30% of the world's boreal forest, 20% of the world's freshwater resources, the world's longest coastline, and one of the world's largest marine territories. The country's natural areas include critical habitat for species at risk on land and at sea; thousands of lakes and rivers that provide drinking water and energy; and forests and wetlands that store greenhouse gases, produce oxygen and regulate flooding.

Protecting these important areas from degradation is one of Canada's key means of conserving biodiversity and is vital in maintaining the ecosystem services provided by these areas. Canada's protected and conserved areas can also be used to provide a living legacy for future generations of Canadians. For example, different types of protected or conserved areas can be used to provide opportunities for people to discover and learn about nature or to protect culturally important sites. Over the years Canada has made great progress through the creation of national, provincial, and municipal parks and many other types of conserved areas that complement the role of protected areas in conserving nature. There has also been some progress made during the past decade, including for conserving terrestrial and inland water areas; an increased number of measures, supported by additional dedicated Nature funding, will help to achieve the target.

Level of application

☐ Regional/multilateral
☒ National/federal
☐ Subnational – provinces, territories, municipalities all contribute

Relevance of the national targets to the Aichi Biodiversity Targets

Main related Aichi Biodiversity Targets

☐ 1	☐ 6	☒ 11	☐ 16
☐ 2	☐ 7	☐ 12	☐ 17
☐ 3	☐ 8	☐ 13	☐ 18
☐ 4	☐ 9	☐ 14	☐ 19
☐ 5	☐ 10	☐ 15	☐ 20

Other relevant information

The *2020 Biodiversity Goals and Targets for Canada* were developed collaboratively by federal, provincial, and territorial governments and national Indigenous organizations, with reviews and input from a diversity of stakeholder groups including industry sectors, academia, and environmental non-government organizations. These are aspirational targets inspired by the global Aichi Targets, and are meant not only for governments but for all sectors of Canadian society, including industry and private

citizens. Provincial and Territorial governments recognize the importance of ensuring that Indigenous peoples, including First Nations, Inuit and Métis women are involved in decision making for protected areas involving their lands and recognize and support Indigenous rights, responsibilities, authorities and priorities in conservation. Where possible, the national targets and their indicators were aligned with the *Canadian Environmental Sustainability Indicators* which includes a well-established, robust reporting mechanism for tracking trends over time. Canada's biodiversity targets were endorsed by federal, provincial, and territorial government Ministers responsible for conservation, wildlife, and biodiversity, and were officially announced in February 2015. Plans for achieving this particular target are documented in Sections II and III of this report.

Relevant websites, web links, and files

- 2020 Biodiversity Goals and Targets for Canada: http://biodivcanada.ca/default.asp?lang=En&n=9B5793F6-1
- Pathway to Canada Target 1: http://www.conservation2020canada.ca/home/
- Meeting Canada's Marine Conservation Targets: http://www.dfo-mpo.gc.ca/oceans/conservation/plan-eng.html
- Canadian Environmental Sustainability Indicators, Protected areas: https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/conserved-areas.html
- Federal Sustainable Development Strategy, Sustainably managed lands and forests: http://www.fsds-sfdd.ca/index.html#/en/detail/all/goal:G08
- Federal Sustainable Development Strategy, Healthy coasts and oceans: http://www.fsds-sfdd.ca/index.html#/en/detail/all/goal:G06

Canada Target 2. By 2020, species that are secure remain secure, and populations of species at risk listed under federal law exhibit trends that are consistent with recovery strategies and management plans.

Rationale for the national target

Canada is home to a unique variety of plants and animals. These species not only represent Canada's rich biodiversity, but are also an integral part of all Canadians' natural and cultural heritage. This is especially the case for Indigenous peoples. Each species plays a key role in maintaining the overall health of ecosystems as ensuring the health of native populations of species is fundamental to preserving Canada's biodiversity and the benefits that it provides. However, the well-being of some of these species is under threat.

In 1995 Canada's federal, provincial, and territorial governments adopted the *Canadian Biodiversity Strategy* as Canada's National Biodiversity Strategy and Action Plan (NBSAP) as required under the CBD. This led to the *Accord for the Protection of Species at Risk*, by which federal, provincial and territorial government Ministers committed to designate species at risk, protect their habitats, and develop recovery plans, and to develop complementary legislation, regulations, policies and programs to achieve these outcomes. Federal legislation, the *Species at Risk Act*, was passed in 2002. This law recognizes the essential role of Indigenous peoples of Canada in the conservation of wildlife and included among other things, the creation of the National Aboriginal Council on Species at Risk.

Canada is home to about 80,000 different species, and to maintain biodiversity, there is a need to ensure that the species that are assessed as secure remain secure, since the loss of a species is a loss of biodiversity. Canada has over 500 species that are listed under federal law as "at risk", largely as a result of habitat loss and degradation, competition from invasive alien species, and environmental changes resulting from climate change and pollution. When a plant or an animal is determined to be at risk under federal law, plans for its recovery or management must be made. Concerted effort at local, provincial, territorial and federal levels is essential to ensure improvements in the condition of species and meet the objectives laid out in recovery strategies.

Level of application

☐ Regional/multilateral
☒ National/federal
☐ Subnational – federal, provincial, and territorial governments have own policies and collaborate

Relevance of the national targets to the Aichi Biodiversity Targets

Main related Aichi Biodiversity Targets

☐ 1	☐ 6	☐ 11	☐ 16
☐ 2	☐ 7	☒ 12	☐ 17
☐ 3	☐ 8	☐ 13	☐ 18
☐ 4	☐ 9	☐ 14	☐ 19
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Other relevant information

The *2020 Biodiversity Goals and Targets for Canada* were developed collaboratively by federal, provincial, and territorial governments and national Indigenous organizations, with reviews and input from a diversity of stakeholder groups including industry sectors, academia, and environmental non-government organizations. These are aspirational targets inspired by the global Aichi Targets, and are meant not only for governments but for all sectors of Canadian society, including industry and private citizens. Where possible, the national targets and their indicators were aligned with the *Canadian Environmental Sustainability Indicators* which includes a well-established, robust reporting mechanism for tracking trends over time. Canada's biodiversity targets were endorsed by federal, provincial, and territorial government Ministers responsible for conservation, wildlife, and biodiversity, and were officially announced in February 2015, becoming part of Canada's NBSAP.

Relevant websites, web links, and files

- 2020 Biodiversity Goals and Targets for Canada: http://biodivcanada.ca/default.asp?lang=En&n=9B5793F6-1
- Canadian Environmental Sustainability Indicators, Status of wild species: https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/status-wild-species.html
- Canadian Environmental Sustainability Indicators, Species at risk population trends: https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/species-risk-population-trends.html
- Federal Sustainable Development Strategy, Healthy wildlife populations: http://www.fsds-sfdd.ca/index.html#/en/detail/all/goal:G09

The following links relate to federal, provincial and territorial legislative initiatives and frameworks on the issue of species at risk:

- Canada's Federal Government webpages on Species at Risk: http://www.sararegistry.gc.ca/default.asp?lang=En&n=24F7211B-1
- Northwest Territories SAR: http://www.nwtspeciesatrisk.ca/SpeciesAtRisk
- Province of Alberta SAR: http://aep.alberta.ca/fish-wildlife/species-at-risk/default.aspx
- Province of British Columbia SAR: https://www2.gov.bc.ca/gov/content/environment/plants-animals-ecosystems/species-ecosystems-at-risk
- Province of Manitoba SAR: https://www.gov.mb.ca/sd/wildlife/sar/index.html
- Province of New Brunswick SAR: http://www2.gnb.ca/content/gnb/en/departments/erd/natural_resources/content/wildlife/content/SpeciesAtRisk.html
- Province of Newfoundland and Labrador SAR: http://www.flr.gov.nl.ca/wildlife/endangeredspecies/index.html
- Province of Nova Scotia SAR: https://novascotia.ca/natr/wildlife/biodiversity/species-list.asp
- Province of Ontario SAR: https://www.ontario.ca/page/species-risk

- Province of Prince Edward Island SAR: https://www.princeedwardisland.ca/en/information/communities-land-and-environment/species-risk-pei
- Province of Saskatchewan SAR: http://www.environment.gov.sk.ca/Default.aspx?DN=c2e39ae8-cbf1-4f07-8d9a-b50ce3f4fd01
- Les sites web du Québec sur EMV : http://www.mddelcc.gouv.qc.ca/biodiversite/habitats/index.htm https://www.mffp.gouv.qc.ca/faune/especes/menacees/index.jsp
- Yukon Territory SAR: http://www.env.gov.yk.ca/animals-habitat/speciesrisk.php

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Canada Target 3. By 2020, Canada's wetlands are conserved or enhanced to sustain their ecosystem services through retention, restoration and management activities.

Rationale for the national target

Canada is home to 25 percent of the world's wetlands, which include bogs, fens, swamps, marshes, and shallow/open waters. Wetlands are directly responsible for a number of ecosystem services that Canadians rely on, such as reducing the impact of floods and droughts, water filtration, erosion control, protecting communities from storm surge, and storing of substantial quantities of greenhouse gases, as well as offering opportunities for outdoor recreation, education, hunting and fishing. Furthermore, wetlands are key to the lifecycles of a huge range of plants and animals, including one-third of Canada's species at risk. Yet, despite their importance, wetland degradation is continuing and loss has now reached critical levels in many areas of the country. In order to reduce the negative effects of wetland loss, there is a need to ensure that remaining wetlands are conserved and utilized in a sustainable manner so that the benefits of wetlands continue. Conserving and enhancing wetlands will benefit wildlife and plant species, ensure the maintenance of vital ecosystems and the benefits Canadians receive from them, sometimes known as ecosystem services, and contribute to the health and well-being of Canadians.

Level of application

☐ Regional/multilateral
☒ National/federal
☐ Subnational – All Canadian provinces and territories

Relevance of the national targets to the Aichi Biodiversity Targets

Main related Aichi Biodiversity Targets

☐ 1	☐ 6	☐ 11	☐ 16
☐ 2	☐ 7	☐ 12	☐ 17
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Other relevant information

This target highlights the important role that stewards of Canada's wetlands have in maintaining the health and wellbeing of a vital ecosystem that benefits all Canadians. It reinforces the commitments to wetlands already in place when the target was developed. The North American Waterfowl Management Plan, for example, working with private landowners and governments, has reduced the rate of loss and degradation since 1986 by protecting and conserving wetlands and influencing stewardship activities of landowners, farmers, land managers and conservation agencies. Since 2002 Ducks Unlimited Canada has led a partnership in developing a Canadian Wetlands Inventory. Environment and Climate Change Canada has more recently developed the Wetlands Indicator under the Canadian Environmental Sustainability Indicators initiative. These projects build on the mapping efforts of all jurisdictions by creating standards for detecting, classifying and mapping wetlands by the different wetland types across Canada. Despite these efforts, declines and degradation continue. Continued commitment and collaboration by many players, including municipal and regional land use planners, developers, agriculture and industry sectors, and recreational users is vital.

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Relevant websites, web links, and files

- 2020 Biodiversity Goals and Targets for Canada: http://biodivcanada.ca/default.asp?lang=En&n=9B5793F6-1
- Canadian implementation of NAWMP: http://nawmp.wetlandnetwork.ca/
- Ducks Unlimited Canada's wetland website: http://www.ducks.ca/our-work/wetlands/
- Ducks Unlimited Canada's Wetland Inventory website: http://www.ducks.ca/initiatives/canadian-wetland-inventory/
- Canadian Environmental Sustainability Indicator for Wetlands: https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/extent-wetlands.html
- Canadian Environmental Sustainability Indicators: https://www.ec.gc.ca/indicateurs-indicators/
- North American Waterfowl Management Plan: http://nawmp.wetlandnetwork.ca/

Canada Target 4. By 2020, biodiversity considerations are integrated into municipal planning and activities of major municipalities across Canada.

Rationale for the national target

In 2015, approximately 80 percent of the Canadian population was living in the largest urban areas (Census Metropolitan Areas, or CMAs). The total area of land in Canada's CMAs almost doubled between 1971 and 2001. Although urban areas occupy a relatively small portion of Canada, they are often situated in places particularly rich in biodiversity, such as coastal areas, river valleys, and on the shores of lakes, so the impact of habitat loss occurring from urbanization may be disproportionate relative to the area disturbed. Urban expansion can also alter watersheds, degrading water quality for aquatic biodiversity and increasing vulnerability to flooding. The importance of healthy ecosystems in urban settings has become better understood in recent years. Some of the benefits for urban dwellers of increased green space include cleaner air and reduced respiratory illness, buffering of increasingly extreme climate events, opportunities for environmental education and improved cognitive development, recreation, and more. Urban forests and other natural or naturalized areas not only create attractive neighbourhoods, but can provide natural infrastructure outcomes that, for example, support water and air quality, help with flood control and reducing erosion. Urban biodiversity underpins these ecosystem services and supports pollinator species, and avian and other species that help to control pest insects. Municipalities are uniquely positioned to play a significant role by developing locally tailored biodiversity solutions.

Level of application

☐ Regional/multilateral
☒ National/federal
☐ Subnational - municipalities

Relevance of the national targets to the Aichi Biodiversity Targets

Main related Aichi Biodiversity Targets

☐ 1	☐ 6	☐ 11	☐ 16
☒ 2	☐ 7	☐ 12	☐ 17
☐ 3	☐ 8	☐ 13	☐ 18
☐ 4	☐ 9	☐ 14	☐ 19
☐ 5	☐ 10	☐ 15	☐ 20

Other relevant information

At the time that this target was developed many Canadian municipalities were already working directly and indirectly to integrate biodiversity priorities into their planning and activities. For example, Montreal and Ottawa were among the cities that contributed to the development of the *City and Biodiversity Index*, an internationally developed self-assessment tool designed to help evaluate urban conservation efforts and progress in reducing the rate of biodiversity loss in urban ecosystems. Provincial governments have long been providing guidance to their municipalities for the conservation and sustainable use of biodiversity. Municipal organizations operating at the national scale, including the Federation of Canadian Municipalities and ICLEI-Canada, have also actively emphasized the value of biodiversity in the urban context and importance of integrating biodiversity considerations at the municipal level. The federal

government established the Rouge Urban National Park in 2015, which, with support and contributions of land from the province of Ontario, the Toronto and Region Conservation Authority, the cities of Toronto, Markham and Pickering, and the municipalities of York and Durham, protects nearly 80 square kilometres of critical ecosystems in the heart of Canada's largest metropolitan area surrounded by a population of 7 million people.

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Relevant websites, web links, and files

- 2020 Biodiversity Goals and Targets for Canada: http://biodivcanada.ca/default.asp?lang=En&n=9B5793F6-1
- ICLEI Canada: http://www.icleicanada.org/programs/biodiversity

Canada Target 5. By 2020, the ability of Canadian ecological systems to adapt to climate change is better understood, and priority adaptation measures are underway.

Rationale for the national target

The effects of climate change are being experienced around the world. In Canada, temperatures are increasing with widespread impacts on terrestrial and marine ecosystems, including shifts in the range of ecosystems, altered migration and breeding times, changes in natural disturbance regimes, and shifts in the distribution, productivity and abundance of species. Changes in climate can affect biodiversity either directly or indirectly as a result of, for instance, temperature and precipitation changes, shifts in seasons, and frequency and intensity of extreme weather events and other natural disturbances such as fires. In addition to presenting new challenges, climate change exacerbates many of the most significant existing threats to biodiversity, such as habitat loss and the introduction and spread of invasive alien species (see Canada Target 11).

These ecological changes impact the social, cultural, health, and economic well-being of communities, businesses, organizations, governments and for Indigenous peoples across Canada. The sustainable management, conservation, and restoration of biodiversity and ecosystems that are healthy, biologically diverse and climate-resilient, can also provide secondary benefits that help society adapt to climate change. This includes buffering from climate impacts including severe flooding, and through the provision of food, raw materials and natural resources, pollination, fresh water, recreation and natural ways to store carbon. Wilderness areas, working landscapes and seascapes, and urban ecosystems also provide important ecosystem services, such as natural cooling, improved air quality, water filtration, and mental health benefits.

A better understanding of the adaptive capacity of Canada's biophysical systems will help develop effective adaptation measures, as well as knowing where, when, and how to respond to be able to monitor and report on changes over time. A focus on implementing adaptive measures for priority areas and species of concern allows Canada to begin addressing the most pressing climate change impacts on biodiversity and enhancing ecosystem resiliency while recognizing that more needs to be done.

Level of application

☐ Regional/multilateral
☒ National/federal
☐ Subnational – efforts are led by all levels of government

Relevance of the national targets to the Aichi Biodiversity Targets

Main related Aichi Biodiversity Targets

☐ 1	☐ 6	☐ 11	☐ 16
☐ 2	☐ 7	☐ 12	☐ 17
☐ 3	☐ 8	☐ 13	☐ 18
☐ 4	☐ 9	☐ 14	☒ 19
☐ 5	☐ 10	☐ 15	☐ 20

Other relevant information

To meet this target, governments and stakeholders across Canada will need to continue to work collaboratively to identify the key vulnerabilities of ecological systems and biodiversity to climate change and better understand and facilitate the capacity of key areas and species to adapt to the most pressing impacts. Activities are underway by a variety of organizations in governments, academia, and environmental non-governmental organizations.

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In addition, Indigenous peoples and the holders of Indigenous knowledge have a long history and ongoing understanding about adapting to changes in climate and the land. Across Canada, Indigenous peoples are working to conserve and manage their lands. This includes monitoring wildlife, patrolling protected areas and reducing climate impacts. Through this process, Indigenous leaders continue to honor their cultural traditions while training the next generation of leaders. These efforts strengthen local communities and contribute to the resilience of biodiversity and ecosystems to climate impacts.

Relevant websites, web links, and files

- 2020 Biodiversity Goals and Targets for Canada: http://biodivcanada.ca/default.asp?lang=En&n=9B5793F6-1
- Pan-Canadian Framework on Clean Growth and Climate Change: https://www.canada.ca/en/services/environment/weather/climatechange/pan-canadian-framework.html

Canada Target 6. By 2020, continued progress is made on the sustainable management of Canada's forests.

Rationale for the national target

Forests are essential to the long term well-being of Canada's communities, economy, and environment. As stewards of 9% of the world's forests, Canada is dedicated to maintaining its forests in a healthy state and to managing them in a sustainable manner.

Continued progress on sustainable forest management is important to Canada for several reasons. These include ensuring that Canada's forests continue to provide species habitat along with a range of ecosystem services including air and water filtration and carbon sequestration, particularly in the face of ecological challenges such as climate change. Sustainably managed forests provide significant social, environmental and economic benefits and are important to rural economies and livelihoods and for sustaining traditional and contemporary Indigenous ways of life. In addition, domestic and international consumers expect that forest products will come from sustainably managed forests, and Canada's commitment to sustainable forest management allows the country to access markets that would otherwise be unavailable. Canada has a strong record of managing its forests sustainably but needs to build on that record in order to realize the full range of economic, environmental, and social benefits the forests.

Level of application

☐ Regional/multilateral
☒ National/federal
☐ Subnational – Provincial, Territorial

Relevance of the national targets to the Aichi Biodiversity Targets

Main related Aichi Biodiversity Targets

☐ 1	☐ 6	☐ 11	☐ 16
☐ 2	☒ 7	☐ 12	☐ 17
☐ 3	☐ 8	☐ 13	☐ 18
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Additional relevant information on the process or development of adopting the national target

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Relevant websites, web links, and files

- 2020 Biodiversity Goals and Targets for Canada: http://biodivcanada.ca/default.asp?lang=En&n=9B5793F6-1
- Natural Resource Canada's Sustainable Forest Management web page: https://www.nrcan.gc.ca/forests/canada/sustainable-forest-management/13183
- Canadian Environmental Sustainability Indicator, extent of Canada's wetlands: https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/extent-wetlands.html
- Federal Sustainable Development Strategy, Sustainably managed lands and forests: http://www.fsds-sfdd.ca/index.html#/en/detail/all/goal:G08

Canada Target 7. By 2020, agricultural working landscapes provide a stable or improved level of biodiversity and habitat capacity.

Rationale for the national target

Agricultural production benefits from the ecosystem services biodiversity provides, such as nutrient cycling, soil formation, water purification and pollination. At the same time, agricultural working landscapes can support biodiversity, providing important habitat for wildlife in Canada. Agricultural areas in Canada often contain many different habitat types, including cropland, pastures, grasslands, forests, wetlands and water bodies, including many areas of natural or semi-natural vegetation. Declines in the capacity of Canada's agricultural lands to support the habitat needs of species have been due in large part to the conversion of natural areas to cropland and agricultural intensification on existing farmland. Improving biodiversity on agricultural lands is key to sustaining natural systems, maintaining water quality and quantity, supporting pollinators, improving wildlife habitat and connectivity, and making agro-ecosystems better able to recover and adapt to environmental stresses such as drought.

Level of application

☐ Regional/multilateral
☒ National/federal
☒ Subnational – Provincial

Relevance of the national targets to the Aichi Biodiversity Targets

Main related Aichi Biodiversity Targets

☐ 1	☐ 6	☐ 11	☐ 16
☐ 2	☒ 7	☐ 12	☐ 17
☐ 3	☐ 8	☐ 13	☐ 18
☐ 4	☐ 9	☐ 14	☐ 19
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Other relevant information

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Relevant websites, web links, and files

- 2020 Biodiversity Goals and Targets for Canada: http://biodivcanada.ca/default.asp?lang=En&n=9B5793F6-1

- Canadian Environmental Sustainability Indicator, Wildlife habitat capacity on agricultural land: https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/wildlife-habitat-capacity-agricultural-land.html

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Canada Target 8. By 2020, all aquaculture in Canada is managed under a science-based regime that promotes the sustainable use of aquatic resources (including marine, freshwater and land based) in ways that conserve biodiversity.

Rationale for the national target

Aquaculture refers to the cultivation of aquatic species, usually for commercial harvest, processing, sale and consumption. At the time Target 8 was developed, commercial aquaculture in Canada contributed nearly 30% of the total value of Canadian fish and seafood production. Salmon was the main species farmed in Canada, making up almost two thirds of total production volume. Aquaculture operations have been established in every Canadian province and in Yukon, and it impacts many rural and coastal areas, including many Indigenous communities. Continued active, responsive management and consultation with different levels of government, industry, and Indigenous groups are essential to ensure the health of ecosystems in which aquaculture takes place, and that environmental impacts are mitigated by management actions and regulations informed by dedicated aquaculture science in order to foster a sustainable and innovative industry that remains globally competitive.

Level of application

☐ Regional/multilateral
☒ National/federal
☐ Subnational

Relevance of the national targets to the Aichi Biodiversity Targets

Main related Aichi Biodiversity Targets

☐ 1	☐ 6	☐ 11	☐ 16
☐ 2	☒ 7	☐ 12	☐ 17
☐ 3	☐ 8	☐ 13	☐ 18
☒ 4	☐ 9	☐ 14	☐ 19
☐ 5	☐ 10	☐ 15	☐ 20

Other relevant information

The *2020 Biodiversity Goals and Targets for Canada* were developed collaboratively by federal, provincial, and territorial governments and national Indigenous organizations, with reviews and input from a diversity of stakeholder groups including industry sectors, academia, and environmental non-government organizations. These are aspirational targets inspired by the global Aichi Targets, and are meant not only for governments but for all sectors of Canadian society, including industry and private citizens. Where possible, the national targets and their indicators were aligned with the *Canadian Environmental Sustainability Indicators* which includes a well-established, robust reporting mechanism for tracking trends over time. Canada's biodiversity targets were endorsed by federal, provincial, and territorial government Ministers responsible for conservation, wildlife, and biodiversity, and were officially announced in February 2015, becoming part of Canada's NBSAP.

Relevant websites, web links, and files

- 2020 Biodiversity Goals and Targets for Canada: http://biodivcanada.ca/default.asp?lang=En&n=9B5793F6-1

- Canadian Environmental Sustainability Indicator, Management of Canadian aquaculture: https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/management-canadian-aquaculture.html
- Federal Sustainable Development Strategy, Sustainable food: http://www.fsds-sfdd.ca/index.html#/en/detail/all/goal:G11

Canada Target 9. By 2020, all fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem-based approaches.

Rationale for the national target

Canada's fisheries provide a variety of socio-economic benefits, such as sustenance, employment, recreation, and access to traditional foods. However, where they occur, unsustainable fishing practices compromise biodiversity and the long-term well-being of fisheries, and the communities who depend on them. In order to ensure the future enjoyment of these benefits and the economic sustainability of commercial, recreational, and Indigenous fisheries, it is important to protect and promote healthy ecosystems by avoiding destructive fishing practices, managing bycatch, recovering depleted stocks, and preventing overfishing.

Level of application

☐ Regional/multilateral
☒ National/federal
☐ Subnational

Relevance of the national targets to the Aichi Biodiversity Targets

Main related Aichi Biodiversity Targets

☐ 1	☒ 6	☐ 11	☐ 16
☐ 2	☐ 7	☐ 12	☐ 17
☐ 3	☐ 8	☐ 13	☐ 18
☐ 4	☐ 9	☐ 14	☐ 19
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Other relevant information

The *2020 Biodiversity Goals and Targets for Canada* were developed collaboratively by federal, provincial, and territorial governments and national Indigenous organizations, with reviews and input from a diversity of stakeholder groups including industry sectors, academia, and environmental non-government organizations. These are aspirational targets inspired by the global Aichi Targets, and are meant not only for governments but for all sectors of Canadian society, including industry and private citizens. Where possible, the national targets and their indicators were aligned with the *Canadian Environmental Sustainability Indicators* which includes a well-established, robust reporting mechanism for tracking trends over time. Canada's biodiversity targets were endorsed by federal, provincial, and territorial government Ministers responsible for conservation, wildlife, and biodiversity, and were officially announced in February 2015.

Relevant websites, web links, and files

- 2020 Biodiversity Goals and Targets for Canada: http://biodivcanada.ca/default.asp?lang=En&n=9B5793F6-1
- Canadian Environmental Sustainability Indicator, Sustainable fish harvest: https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/sustainable-fish-harvest.html

- Canadian Environmental Sustainability Indicator, Status of major fish stocks: https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/status-major-fish-stocks.html
- Federal Sustainable Development Strategy, Healthy coasts and oceans: http://www.fsds-sfdd.ca/index.html#/en/detail/all/goal:G06
- Federal Sustainable Development Strategy, Pristine lakes and rivers: http://www.fsds-sfdd.ca/index.html#/en/detail/all/goal:G07
- Federal Sustainable Development Strategy, Safe and healthy communities: http://www.fsds-sfdd.ca/index.html#/en/detail/all/goal:G13

Canada Target 10. By 2020, pollution levels in Canadian waters, including pollution from excess nutrients, are reduced or maintained at levels that support healthy aquatic ecosystems.

Rationale for the national target

Water quality varies widely across Canada because of the country's diverse geography and the different ways in which people have developed the land around rivers and lakes and on the coast. Surface and ground water in Canada is generally clean, however, there are important local or regional pollution issues including eutrophication in major freshwater ecosystems and long-term drinking-water advisories for Indigenous communities. Water quality is important for the maintenance of healthy lake, river and marine ecosystems. Clean water provides essential habitat for aquatic plants and animals, is necessary for human survival, supports many commercial and industrial uses and is at the heart of many recreational activities. Pollution enters water bodies in a number of ways, including industrial and municipal discharge, runoff, spills, and deposition of airborne pollutants.

Certain nutrients are important for aquatic ecosystem health, but can become pollutants at elevated levels. Phosphorus, for example, is a crucial nutrient for growth of plants and algae and a key regulator of the overall productivity of inland aquatic ecosystems and coastal watersheds, but elevated levels can be harmful to the health of freshwater ecosystems, negatively impacting fish and other wildlife, drinking water quality, swimming safety and the visual appearance of lakes. Lakes and rivers that are phosphorus-enriched often have excessive growth of aquatic plants and algae, leading to low-oxygen conditions when this growth decays. This can occur when artificial or natural substances, such as nitrates and phosphates are added to an aquatic system from sources such as detergents and fertilizers. Severe algal blooms including blooms of cyanobacteria have been occurring recently in Lake Winnipeg, Lake Simcoe, Lake Ontario, Lake Erie, and in other Canadian water bodies.

There is a need to act now, as there may be a significant lag between improved practices and reduced eutrophication due to the potential for soils to store phosphorous and other potential pollutants for decades. In addition to ensuring the conditions required to support aquatic biodiversity, protecting Canada's water sources from excess pollutants is necessary to provide the essential ecosystem services that people depend on, particularly clean safe water for personal use as well as for many aspects of Canada’s social and economic activity.

Level of application

☐ Regional/multilateral
☒ National/federal
☐ Subnational – Provincial, Territorial, Municipal, and Watershed

Relevance of the national targets to the Aichi Biodiversity Targets

Main related Aichi Biodiversity Targets

☐ 1	☐ 6	☐ 11	☐ 16
☐ 2	☐ 7	☐ 12	☐ 17
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Other relevant information

Some pollutants are directly hazardous to humans and wildlife. Toxic metals – such as mercury, lead and cadmium – released to water can enter the food web and accumulate in the tissues of living organisms. Other substances – such as polybrominated diphenyl ethers (PBDEs) and perfluorooctane sulfonate (PFOS) – also remain in the environment for long periods after their release and can build up in living organisms leading to high concentrations in some animals. The concentrations of harmful substances can be magnified as they accumulate in animal tissue up the food chain. This can significantly affect higher predators in the ecosystem and potentially disrupt ecosystem services. Due to pollution, many jurisdictions in Canada publish consumption restrictions on freshwater fish for human consumption. Accumulating harmful substances can be a particular issue for First Nation communities that rely significantly on country foods.

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Relevant websites, web links, and files

- 2020 Biodiversity Goals and Targets for Canada: http://biodivcanada.ca/default.asp?lang=En&n=9B5793F6-1
- Canadian Environmental Sustainability Indicator, water indicators: https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/water.html

Canada Target 11. By 2020, pathways of invasive alien species introductions are identified, and risk-based intervention or management plans are in place for priority pathways and species.

Rationale for the national target

According to the International Union for Conservation of Nature (IUCN), invasive alien species (IAS) are the most significant threat to biodiversity after habitat loss. Increasing numbers of invasive species are reaching Canada bringing serious ecological and socio-economic consequences. By 2015, IAS in Canada accounted for at least 27% of all vascular plants, 181 insects, 24 birds, 26 mammals, 2 reptiles, 4 amphibians, several fungi and molluscs, 55 freshwater fish and an unknown number of species that had not yet been detected. There is a need to improve the understanding of the means by which such species are entering Canada, and to take action to prevent their entry and mitigate their impact should they become established.

IAS are species of plants, animals, and micro-organisms that have been relocated to environments outside of their natural past or present distribution and who are harmful because their introduction or spread threatens the environment, the economy or society. Some of the better-known examples in Canada include purple loosestrife, Dutch elm disease, green crab, zebra mussel, and emerald ash borer. Since IAS may have no natural enemies in their new environments, their populations can grow unchecked and have the potential to cause significant damage to the habitats and food sources of native species. In turn, these IAS may impact regional economies and communities that rely for their livelihoods on the ecosystems and species impacted.

IAS are introduced through intentional and unintentional human action by air, land and water pathways. The key to dealing with invasive species is to identify the pathways of introduction - the routes they take to spread to new areas - and cut them off. IAS often arrive as hitch hikers on imported goods, like fruit, as stowaways in transportation or on the bottom of ships, or disease in wildlife. A key goal of Target 11 and Canada's Invasive Alien Species Strategy is to avoid the introduction and establishment of such species in future.

Level of application

☐ Regional/multilateral
☒ National/federal
☐ Subnational – Provincial and Territorial

Relevance of the national targets to the Aichi Biodiversity Targets

Main related Aichi Biodiversity Targets

☐ 1	☐ 6	☐ 11	☐ 16
☐ 2	☐ 7	☐ 12	☐ 17
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Other relevant information

Achieving the target will involve coordinating and building on existing national and regional efforts to understand and respond to alien species introductions. Leveraging ongoing federal, provincial and territorial monitoring and reporting mechanisms to track the development of responses and their efficacy will also be an important contribution to meeting the target. In 2004, federal, provincial and territorial governments introduced *An Invasive Alien Species Strategy for Canada*. A suite of federal legislative and regulatory measures underpin the Strategy including: *Plant Protection Act*, *Seeds Act*, *Health of Animals Act*, *Pest Control Products Act*, *Canada Shipping Act*, *Fisheries Act*, *Wild Animal and Plant Protection and Regulations of International and Interprovincial Trade Act,* and others. Many provinces and territories also have legislation or regulations that address invasive alien species. This Strategy aims to minimize the risk of invasive alien species to the environment, economy, and society. One of the core components of the Strategy is cooperation among participating federal and provincial governments. Indigenous governments, municipalities, and other stakeholders are also important contributors in responding to the challenges of invasive alien species. Invasive alien species councils, for example, active in 8 out of 13 provinces and territories, are multi-stakeholder bodies that play an important role in working with their partners to address the priorities of the Strategy, specifically in developing regional priorities and leveraging local actions to address invasive alien species.

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Relevant websites, web links, and files

- 2020 Biodiversity Goals and Targets for Canada: http://biodivcanada.ca/default.asp?lang=En&n=9B5793F6-1
- An Invasive Alien Species Strategy for Canada: http://publications.gc.ca/site/eng/462217/publication.html
- Canadian Environmental Sustainability Indicator, Newly established invasive alien species in Canada: https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/invasive-alien-species.html

Legislative Acts and Regulatory Measures:

- Plant Protection Act: http://laws-lois.justice.gc.ca/eng/acts/p-14.8/
- Seeds Act: http://laws-lois.justice.gc.ca/eng/acts/s-8/
- Health of Animals Act: http://laws-lois.justice.gc.ca/eng/acts/h-3.3/
- Pest Control Products Act: http://laws-lois.justice.gc.ca/eng/acts/P-9.01/

- Canada Shipping Act: http://laws-lois.justice.gc.ca/eng/acts/s-9/
- Fisheries Act: http://laws-lois.justice.gc.ca/eng/acts/f-14/
- Wild Animal and Plant Protection and Regulations of International and Interprovincial Trade Act: http://laws-lois.justice.gc.ca/eng/acts/W-8.5/

Canada Target 12. By 2020, customary use by Aboriginal [Indigenous] peoples of biological resources is maintained, compatible with their conservation and sustainable use

***Note**: The terms 'Traditional Knowledge' (TK), 'Aboriginal Traditional Knowledge' (ATK), and 'Indigenous Knowledge' (IK) are used interchangeably throughout this report. The terms TK and ATK were formally used in the Canadian context, and the government of Canada is now turning to the use of the terms 'Indigenous' and 'Indigenous Knowledge'.*

Rationale for the national target

For thousands of years, Indigenous peoples in Canada have depended on the land, water, ice, and the resources that healthy ecosystems provide to meet their physical, social, cultural and spiritual needs. Indigenous peoples continue to have an intimate cultural relationship with the landscape and the resources derived from the land and water. Customary use of biological resources, including such activities as hunting, fishing, trapping and gathering, is an important element of this relationship. This customary use of biological resources is be exercised by Indigenous communities under their law-making authority on their resources. It may also be exercised by those communities having Indigenous or Treaty rights to do so. Aboriginal [Indigenous] and Treaty rights are recognized and affirmed by section 35 of the *Canada Constitution Act, 1982*.

Twenty-five modern treaties are in place in Canada which, among other things, address the role of signatories to those treaties respecting land management, wildlife harvesting and management, establishment and management of national parks and conservation areas, and natural resource conservation and development. These modern treaties cover over 50 percent of Canada's landmass.

In Canada, through colonizing instruments such as the *Indian Act*, the Crown has assumed control over the traditional territory of Indigenous people, resulting in the removal of their powers to manage their lands. More recently, however, agreements between governments and Indigenous authorities have allowed Indigenous peoples to draw down jurisdiction through sectoral agreements and other forms of self-government and collective management. For example, the creation of wildlife cooperative management bodies have allowed many Indigenous communities to regain management authorities relating to the use of settlement and reserve lands and management of the resources on those lands. Through negotiated cooperative agreements, Indigenous peoples have started to assume the management of biological resources.

Level of application

☐ Regional/multilateral
☒ National/federal
☐ Subnational – Provincial, Territorial, and Indigenous

Relevance of the national targets to the Aichi Biodiversity Targets

Main related Aichi Biodiversity Targets

☐ 1	☐ 6	☐ 11	☐ 16
☐ 2	☐ 7	☐ 12	☐ 17
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Other relevant information

The protection of customary practices related to the use of biological resources and the encouragement of their use is compatible with objectives shared by both the Government of Canada and Indigenous peoples related to conservation and sustainable use.

As Canada confronts its history of colonization and the denial of Indigenous peoples and their rights, efforts to achieve Target 12 will include actions to support Indigenous peoples in their exercise of greater jurisdiction in the management of their traditional lands and resources. Federal, provincial, and territorial governments engage with Indigenous peoples to negotiate Modern Treaties, Self-Government Agreements, and other arrangements that set out roles respecting land management, wildlife harvesting and management, establishment and management of national parks and conservation areas, and natural resource conservation and development.

The 2020 Biodiversity Goals and Targets for Canada were developed collaboratively by federal, provincial, and territorial governments and national Indigenous organizations, with reviews and input from a diversity of stakeholder groups including industry sectors, academia, and environmental non-government organizations. These are aspirational targets inspired by the global Aichi Targets, and are meant not only for governments but for all sectors of Canadian society, including industry and private citizens.

Achievement of each of the 2020 Biodiversity Goals and Targets for Canada will require full, effective, and meaningful collaboration between the federal, provincial, and territorial governments and First Nations, Inuit and Métis peoples; men and women alike. In this respect, while Indigenous knowledge and customary use of biological resources are specifically highlighted under Targets 12 and 15, the knowledge, innovations and practices of Indigenous communities are relevant for implementing all of Canada's biodiversity goals and targets.

Canada's biodiversity targets were endorsed by federal, provincial, and territorial government Ministers responsible for conservation, wildlife, and biodiversity, and were officially announced in February 2015, becoming part of Canada's NBSAP.

Relevant websites, web links, and files

- 2020 Biodiversity Goals and Targets for Canada: http://biodivcanada.ca/default.asp?lang=En&n=9B5793F6-1

Canada Target 13. By 2020, innovative mechanisms for fostering the conservation and sustainable use of biodiversity are developed and applied.

Rationale for the national target

Biodiversity underpins many valuable ecosystem services that provide an enormous range of social, cultural, economic, and infrastructure benefits to Canadians. Successfully safeguarding biodiversity will mean exploring and applying the fullest possible range of strategies and tools. It will also mean harnessing innovation, expanding existing partnerships and forging new ones. It will entail different kinds of knowledge including the physical and social sciences, traditional and practitioner knowledge, and economics. Collaborative approaches to ecosystem and resource management are gaining momentum and have the added benefit of fostering stronger social networks and long-lasting solutions. Globally, efforts are growing to use economic, institutional and legal incentives to promote the conservation and sustainable use of biodiversity. Economic instruments, for example, can encourage environmentally friendly practices, boost green technology and innovation, and discourage resource waste and inefficiency without harming competitiveness and potentially enhancing it. Further, they can be applied in a wide range of ecosystem settings – from private woodlots and ranches, to public forests and downtown neighbourhoods. Much could be achieved by building on past successes, applying existing measures in new ways, and integrating biodiversity considerations into the mainstream of day-to-day decision-making in all sectors.

Level of application

☐ Regional/multilateral
☒ National/federal
☐ Subnational – Indigenous, Provincial, Territorial, Municipal, Watershed, NGO

Relevance of the national targets to the Aichi Biodiversity Targets

Main related Aichi Biodiversity Targets

☐ 1	☐ 6	☐ 11	☐ 16
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Other relevant information

Canada already has a strong record of innovation and there are many examples of Canadians working together to broaden the conservation "toolbox". In Canada, measures for the protection of ecologically sensitive lands, beyond simple acquisition are well established at all levels of government and in collaboration with non-governmental organizations such as land trusts, and through public-private partnerships. Meeting Target 13 will involve continuing these efforts, as well as further efforts to eliminate barriers to, and encourage investments in, conservation and sustainable use of biodiversity. Assessing the efficacy of such innovative mechanisms in terms of environmental effects will identify best practices and support achieving the target.

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Relevant websites, web links, and files

- 2020 Biodiversity Goals and Targets for Canada: http://biodivcanada.ca/default.asp?lang=En&n=9B5793F6-1

Canada Target 14. By 2020, the science base for biodiversity is enhanced and knowledge of biodiversity is better integrated and more accessible.

Rationale for the national target

Information and understanding is essential for managing and conserving biodiversity. In order to improve Canada's understanding of the benefits of ecosystem services and the impacts of biodiversity loss on the functioning of ecosystems and on society, information about biodiversity values, ecosystem processes, vulnerabilities, and the status and trends of the country's ecosystems and species is needed, in a form that is easily accessible to decision-makers.

Canada's biodiversity and ecosystem services knowledge base is growing, through efforts to incorporate relevant information from multiple perspectives including Indigenous knowledge. Improved capacity to measure and monitor biodiversity is an important step towards increasing Canada's comprehension of the effects human activities and management practices have on ecosystems.

Level of application

☐ Regional/multilateral
☒ National/federal
☐ Subnational – Indigenous, Provincial, Territorial, Academic

Relevance of the national targets to the Aichi Biodiversity Targets

Main related Aichi Biodiversity Targets

☐ 1	☐ 6	☐ 11	☐ 16
☐ 2	☐ 7	☐ 12	☐ 17
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Other relevant information

Ongoing research is vital to furnishing a deeper understanding of biodiversity. Advances in remote sensing, geographic information systems, bioinformatics and the internet offer unprecedented potential for developing and sharing data, setting the stage for a next wave of knowledge innovation. Improving Canada's biodiversity knowledge base involves harnessing the advantages of innovation, enabling greater potential for collaboration between governments, citizen-science initiatives, Indigenous groups, universities and private sector organizations.

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territorial government Ministers responsible for conservation, wildlife, and biodiversity, and were officially announced in February 2015, becoming part of Canada's NBSAP.

Relevant websites, web links, and files

- 2020 Biodiversity Goals and Targets for Canada: http://biodivcanada.ca/default.asp?lang=En&n=9B5793F6-1

Canada Target 15. By 2020, Aboriginal traditional knowledge [Indigenous Knowledge] is respected, promoted and, where made available by Aboriginal [Indigenous] peoples, regularly, meaningfully and effectively informing biodiversity conservation and management decision-making

Note: *The terms 'Traditional Knowledge' (TK), 'Aboriginal Traditional Knowledge' (ATK), and 'Indigenous Knowledge' (IK) are used interchangeably throughout this report. The terms TK and ATK were formally used in the Canadian context, and the government of Canada is now turning to the use of the term 'Indigenous' and 'Indigenous Knowledge'*

Rationale for the national target

As Canada's first inhabitants, Indigenous peoples have a unique relationship with its ecosystems, species, and resources. This relationship is reflected through their cultural and spiritual valuation of the land, as well as their direct dependence on ecosystems through traditional activities such as hunting and fishing. They possess valuable knowledge of flora and fauna, gained from long-term close interaction with Canadian ecosystems, and which they apply in their ongoing customary use of biological resources.

The incorporation of Indigenous knowledge (IK) has been a valuable contributor to the effectiveness of Canada's various biodiversity initiatives, providing information regarding the sustainable use of plants and animals, as well as the relationships and current stresses in ecosystems. Indigenous knowledge and western science are complementary in the way they benefit biodiversity conservation and management in Canada.

Level of application

☐ Regional/multilateral
☒ National/federal
☐ Subnational – Indigenous, Provinces, Territories

Relevance of the national targets to the Aichi Biodiversity Targets

Main related Aichi Biodiversity Targets

☐ 1	☐ 6	☐ 11	☐ 16
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Other relevant information

IK has been used to inform Canadian biodiversity strategies, land use plans, designating of protected areas, and species assessment. The negotiation of land claims and other agreements have led to the development of partnerships that promote mutual respect and protection of cultural and ecological values. Initiatives such as the Boreal Caribou Recovery Strategy provide examples in which Indigenous knowledge has informed decision-making. Government departments and agencies are bringing Indigenous knowledge into management and decision-making related to land and marine-protected areas. This ensures the interests of local Indigenous communities are considered, for example, in the

management of national parks and national historic sites, and through interpretative activities and signage in these sites.

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Achievement of each of the *2020 Biodiversity Goals and Targets for Canada* will depend on full, effective, and meaningful collaboration between federal, provincial, and territorial governments and Indigenous peoples, including First Nations, Inuit and Métis peoples; men and women alike. In this respect, while IK and customary use of biological resources are specifically highlighted under Targets 12 and 15, the knowledge, innovations and practices of Indigenous communities are relevant for implementing all of Canada's biodiversity goals and targets.

Canada's biodiversity targets were endorsed by federal, provincial, and territorial government Ministers responsible for conservation, wildlife, and biodiversity, and were officially announced in February 2015, becoming part of Canada's NBSAP.

Relevant websites, web links, and files

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Canada Target 16. By 2020, Canada has a comprehensive inventory of protected spaces that includes private conservation areas.

Rationale for the national target

Across Canada there are thousands of protected areas managed by government agencies at various levels, co-managed protected areas, private protected areas, protected areas managed by non-governmental conservation organizations, and Indigenous and local community conserved areas. Canada tracks and reports on the number and total area of federal, provincial and territorial protected areas, and on the number and extent of some co-managed and private conservation areas through the Conservation Areas Reporting and Tracking System (CARTS). Areas reported in CARTS meet the International Union for Conservation of Nature criteria for protected areas, however, this does not completely reflect the broader diversity of conservation areas that exist across the country and that complement the role of protected areas in conserving nature. Integrating data on all of Canada's protected spaces, including publicly and privately owned protected areas and other effective area-based conservation measures on land and at sea is a key to understanding and sharing information on Canada's progress.

Level of application

☐ Regional/multilateral
☒ National/federal
☐ Subnational – Provincial, Territorial, Municipal, Watershed, NGO

Relevance of the national targets to the Aichi Biodiversity Targets

Main related Aichi Biodiversity Targets

☐ 1	☐ 6	☒ 11	☐ 16
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Other relevant information

A number of systems exist for tracking different conservation initiatives, and developing a comprehensive inventory involves collaboration by all partners. Some provinces, territories, regional associations and communities have their own databases of parks, protected areas and other conservation lands, non-governmental conservation organizations maintain information on the extent of privately protected areas, and information on marine conservation efforts is maintained in still other databases. Working together, these organizations continue to enhance Canada's ability to report on the collective conservation efforts by contributing to a comprehensive inventory of protected spaces.

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Environmental Sustainability Indicators which includes a well-established, robust reporting mechanism for tracking trends over time. Canada's biodiversity targets were endorsed by federal, provincial, and territorial government Ministers responsible for conservation, wildlife, and biodiversity, and were officially announced in February 2015, becoming part of Canada's NBSAP.

Relevant websites, web links, and files

- 2020 Biodiversity Goals and Targets for Canada: http://biodivcanada.ca/default.asp?lang=En&n=9B5793F6-1
- Conservation Areas Reporting and Tracking System (CARTS): http://www.ccea.org/carts/

Canada Target 17. By 2020, measures of natural capital related to biodiversity and ecosystem services are developed on a national scale, and progress is made in integrating them into Canada's national statistical system.

Rationale for the national target

"Natural capital" and "ecosystem services" are metaphors used to focus attention on how the natural environment, including ecosystems, support human well-being. "Natural capital" is an economic way of characterizing the structures and processes within ecosystems as stocks of resources that provide flows of goods and services that human societies depend on. These include, among many other examples, food, water, biochemical materials, natural infrastructure functions such as flood mitigation and water purification, and support many aspects of human health and wellbeing. These ecosystem services can be understood as a valuable result of Canada's natural wealth but most of them are only beginning to be accounted for in the national statistical system. Improved accounting of natural capital and ecosystem services should contribute to better environmental and resource management decision making and a reduction in the significant, measured degradation and loss of natural capital related to biodiversity.

In 2011 Canada had no formally established system for measuring aspects of natural capital that extend beyond harvestable or extractable natural resources and some forms of land (which is bought and sold). Canada also had no adequate system for measuring most ecosystem services. Since then, work has started using the international System of Environmental and Economic Accounts (SEEA) Experimental Ecosystem Accounts as the basis for natural capital reporting. The SEEA-EEA is a project of the United Nations Statistics Division but which also involves the work of other organizations and research teams. The UN SEEA-EEA defines how countries can measure natural capital and ecosystem services using a range of measures that can be monetary, physical, and condition-based. The motivation for developing ecosystem accounts comes from a wide range of emerging demands for integrating information on the environmental aspects of sustainability and for information on the links between ecosystem functions and human well-being.

Level of application

☐ Regional/multilateral
☒ National/federal
☐ Subnational – Provincial, Territorial

Relevance of the national targets to the Aichi Biodiversity Targets

Main related Aichi Biodiversity Targets

☐ 1	☐ 6	☐ 11	☐ 16
☒ 2	☐ 7	☐ 12	☐ 17
☐ 3	☐ 8	☐ 13	☐ 18
☐ 4	☐ 9	☐ 14	☐ 19
☐ 5	☐ 10	☐ 15	☐ 20

Other relevant information

The objective of Target 17 is to ensure the opportunity for the diverse values of biodiversity, its contributions to maintaining ecosystem services, and opportunities derived from its conservation and

sustainable use, to be fully reflected in all relevant public and private decision-making frameworks. In a Canadian context, this could include any or all of: environmental statistics and national wealth accounts; indices of well-being; land use and resource management plans and development plans; environmental impact assessments and other similar assessments; and incorporation of biodiversity concepts and tenets in planning and monitoring regimes.

Canada's national statistical agency, Statistics Canada, currently measures selected stocks and flows related to natural capital in physical terms, and when currently feasible, in monetary terms. The agency has a long history of publishing basic statistics on selected elements of natural capital. Statistics Canada is also working with partner departments to implement its Framework for Environmental Statistics. This includes working towards implementing the United Nations recommendations on Environmental and Economic Accounting (UN SEEA Central Framework), and working with the federal policy departments and the international community to develop guidelines and data for ecosystem accounts (UN SEEA-EEA). As a result, new data have been made available on land cover, biomass, wetland extent, natural land parcel size, and ecosystem services valuation.

The *2020 Biodiversity Goals and Targets for Canada* were developed collaboratively by federal, provincial, and territorial governments and national Indigenous organizations, with reviews and input from a diversity of stakeholder groups including industry sectors, academia, and environmental non-government organizations. These are aspirational targets inspired by the global Aichi Targets, and are meant not only for governments but for all sectors of Canadian society, including industry and private citizens. Where possible, the national targets and their indicators were aligned with the *Canadian Environmental Sustainability Indicators* which includes a well-established, robust reporting mechanism for tracking trends over time. Canada's biodiversity targets were endorsed by federal, provincial, and territorial government Ministers responsible for conservation, wildlife, and biodiversity, and were officially announced in February 2015, becoming part of Canada's NBSAP.

Relevant websites, web links, and files

- 2020 Biodiversity Goals and Targets for Canada: http://biodivcanada.ca/default.asp?lang=En&n=9B5793F6-1
- Statistics Canada's Natural Capital Framework: http://www.statcan.gc.ca/eng/node/45
- UN SEEA Central Framework: http://unstats.un.org/unsd/envaccounting/seearev/
- System of Environmental and Economic Accounts: http://unstats.un.org/unsd/envaccounting/seea.asp
- Ecosystem Services Toolkit: An Interdisciplinary Toolkit for Managers and Analysts http://www.biodivcanada.ca/default.asp?lang=En&n=B443A05E-1

Canada Target 18. By 2020, biodiversity is integrated into the elementary and secondary school curricula.

Rationale for the national target

Youth education and awareness of biodiversity is essential if Canada is to grow its next generation of conservation and sustainable development leaders, mainstream biodiversity and meet its biodiversity conservation goals. Mainstreaming the understanding and importance of biodiversity will create a culture of appreciation, conservation, and action. This target emphasizes a key avenue for teaching Canada's youth about biodiversity, by integrating biodiversity into formal education.

Level of application

☐ Regional/multilateral
☒ National/federal
☐ Subnational – Provincial, Territorial

Relevance of the national targets to the Aichi Biodiversity Targets

Main related Aichi Biodiversity Targets

☒ 1	☐ 6	☐ 11	☐ 16
☐ 2	☐ 7	☐ 12	☐ 17
☐ 3	☐ 8	☐ 13	☐ 18
☐ 4	☐ 9	☐ 14	☐ 19
☐ 5	☐ 10	☐ 15	☐ 20

Other relevant information

Provincial and Territorial educational systems are the key vehicle for integrating biodiversity issues into the formal curriculum documents. Biodiversity is taught primarily in the Science or the Science and Technology subject areas across all grade levels. In several provinces, key biodiversity concepts also weave through different grades in other subject areas including Art, Career and Technology Studies, Social Studies, Health and Physical Education and Music. Integration into formal curricula is often supported by informal education at Canadian zoos, aquariums, botanical gardens, National and Provincial parks, museums, outdoor education and environmental education centres and by organizations or programs focused on youth biodiversity education and awareness.

The *2020 Biodiversity Goals and Targets for Canada* were developed collaboratively by federal, provincial, and territorial governments and national Indigenous organizations, with reviews and input from a diversity of stakeholder groups including industry sectors, academia, and environmental non-government organizations. These are aspirational targets inspired by the global Aichi Targets, and are meant not only for governments but for all sectors of Canadian society, including industry and private citizens. Where possible, the national targets and their indicators were aligned with the *Canadian Environmental Sustainability Indicators* which includes a well-established, robust reporting mechanism for tracking trends over time. Canada’s biodiversity targets were endorsed by federal, provincial, and territorial government Ministers responsible for conservation, wildlife, and biodiversity, and were officially announced in February 2015, becoming part of Canada’s NBSAP.

Relevant websites, web links, and files

- 2020 Biodiversity Goals and Targets for Canada: http://biodivcanada.ca/default.asp?lang=En&n=9B5793F6-1

Canada Target 19. By 2020, more Canadians get out into nature and participate in biodiversity conservation activities.

Rationale for the national target

Achieving Canada's biodiversity goals requires extensive collaboration and cooperation by all parts of society. This includes all levels of government, Indigenous peoples, educational and scientific institutions, environmental non-government organizations, business, individual citizens and youth. The reported number of Canadians who willingly participate in, and seek out, sustainable nature-based activities or biodiversity conservation activities can be indicative of their interest in biodiversity in their home, backyard and communities. These activities can take many forms, including visits to parks and wilderness areas, stewardship, Indigenous cultural teachings and land-based activities, volunteering time with conservation organizations, citizen-science activities including monitoring programs, contributing financially and in-kind to conservation projects and causes or taking part in activities to discover and learn more about Canada's biodiversity.

Research has demonstrated that the majority of Canadians enjoy time in nature. Outdoor activities increases one's connection with the natural world and encourages an understanding of the importance and beauty of nature. For many people this helps foster recognition of the value of the natural world in supporting human life and well-being, and encourages them to take part in efforts to conserve biodiversity.

Level of application

☐ Regional/multilateral
☒ National/federal
☐ Subnational – Provincial, Territorial, Municipal, Watershed, NGO

Relevance of the national targets to the Aichi Biodiversity Targets

Main related Aichi Biodiversity Targets

☒ 1	☐ 6	☐ 11	☐ 16
☐ 2	☐ 7	☐ 12	☐ 17
☐ 3	☐ 8	☐ 13	☐ 18
☒ 4	☐ 9	☐ 14	☐ 19
☐ 5	☐ 10	☐ 15	☐ 20

Other relevant information

The *2020 Biodiversity Goals and Targets for Canada* were developed collaboratively by federal, provincial, and territorial governments and national Indigenous organizations, with reviews and input from a diversity of stakeholder groups including industry sectors, academia, and environmental non-government organizations. These are aspirational targets inspired by the global Aichi Targets, and are meant not only for governments but for all sectors of Canadian society, including industry and private citizens. Where possible, the national targets and their indicators were aligned with the *Canadian Environmental Sustainability Indicators* which includes a well-established, robust reporting mechanism for tracking trends over time. Canada's biodiversity targets were endorsed by federal, provincial, and

territorial government Ministers responsible for conservation, wildlife, and biodiversity, and were officially announced in February 2015, becoming part of Canada's NBSAP.

Relevant websites, web links, and files

- 2020 Biodiversity Goals and Targets for Canada: http://biodivcanada.ca/default.asp?lang=En&n=9B5793F6-1
- Federal Sustainable Development Strategy, Connecting Canadians with nature: http://www.fsds-sfdd.ca/index.html#/en/detail/all/goal:G12

Section II. Implementation measures taken, assessment of their effectiveness, associated obstacles and scientific and technical needs to achieve national targets

Describe a measure taken to contribute to the implementation of your country's national biodiversity strategy and action plan

A Nature Legacy for Canada

In 2018 the Government of Canada announced an historic investment in nature conservation. This investment will support a number of national biodiversity targets including Canada Target 1, Target 2, Target 3 and Target 16. The federal Budget for 2018 provided $1.35 billion over 5 years to protect Canada's Natural Legacy. The historic investment in nature conservation will:

- help connect a network of protected and conserved areas across the country by providing resources for the federal network of protected areas and for land conservation and protection efforts by others;
- advance progress on protection and recovery of species at risk;
- build relationships and advancing reconciliation with Indigenous peoples recognizing their rights, responsibilities for lands, wildlife stewardship and related cultural activities to deliver conservation outcomes; and,
- establish a new $500 million Canada Nature Fund.

The Canada Nature Fund is a $500 million federal investment in nature, to be matched by partners, to support the protection of Canada's ecosystems, landscapes and biodiversity, including species at risk. The Fund will be created in partnership with corporate, not-for-profit, provincial, territorial and other partners who will contribute an additional $500 million through matching contributions to raise a total of $1 billion for conservation action.

The new Canada Nature Fund is designed to encourage and support the efforts of other non-federal partners whose participation is critical to achieving successful nature conservation and species recovery. It will support a new approach to the conservation and enhancement of biodiversity through targeted federal investments on protected areas and species at risk that will encourage collaboration by partners.

The Canada Nature Fund will support the Pathway to Canada Target 1 (Aichi Target 11) process through an investment of $300 million over 5 years in establishing protected areas. This part of the Fund has number of sub components including:

- A $10 million Quick Start component that will identify and support near-ready protected areas in 2018-19 to build momentum to Target 1.
- Under a Challenge component, up to $175 million in federal government funding that will support the establishment of up to 35 Indigenous Protected and Conserved Areas and other protected areas, making significant progress towards Canada Target 1 and contributing meaningfully to reconciliation.
- Over $100 million will assist a national organization to coordinate local, provincial/territorial and national conversation organizations to secure and protect ecologically sensitive private lands across the country.

Over $200 million will be dedicated to helping advance a new partnership-based approach to help species at risk focused on priority places, species and threats.

For the implementation measure, please indicate to which national or Aichi Biodiversity Target(s) it contributes

- Canada Targets 1, 2, 3, 16
- Aichi Targets 11, 12

Assessment of the effectiveness of the implementation measure taken in achieving desired outcomes

☐ Measure taken has been effective
☐ Measure taken has been partially effective
☐ Measure taken has been ineffective
☒ Unknown

Please explain the selection and where possible indicate the tools or methodology used for the assessment of effectiveness above

This major initiative is very new, and Canada is currently in the planning stages for its implementation.

Relevant websites, web links and files

- Government of Canada Budget 2018 "Advancement: Part 1. Canada's Natural Legacy" https://www.budget.gc.ca/2018/docs/plan/chap-04-en.html

Describe a measure taken to contribute to the implementation of your country's national biodiversity strategy and action plan

Making progress toward achieving Canada Target 1

In 2015, Canada adopted a suite of national targets known as the "*2020 Biodiversity Goals and Targets for Canada*". Canada Target 1 is directly aligned with Aichi Target 11 and reads: *By 2020, at least 17% of terrestrial areas and inland water, and 10% of marine and coastal areas, are conserved through networks of protected areas and other effective area-based conservation measures.* In addition to Canada Target 1, in 2015 the Government of Canada also committed to an interim target of protecting 5% of marine and coastal areas by 2017.

Since 2015, two distinct national processes have been underway to make progress toward achieving the terrestrial and marine components of Canada Target 1 respectively. These efforts have multiple objectives including:

- Enhance progress toward achieving Canada Target 1 including addressing the quantitative elements of the target by increasing the area conserved, and addressing the qualitative elements of the target (ecological representation, connectivity and landscape integration, areas important for biodiversity and ecosystem services, management effectiveness, and equitable management) including through the development of domestic standards and guidance on other effective area-based conservation measures (OECMs) and these other qualitative elements;
- Encourage dialogue among conservation partners including governments at all levels, Indigenous peoples, private sector, and non-governmental conservation organizations on various elements of Target 1;
- Stimulate dialogue between Canada's federal, provincial and territorial governments and Indigenous peoples on various elements of Target 1 including defining and recognizing Indigenous protected and conserved areas (IPCAs) and possible roles for Indigenous peoples in contributing to Target 1 as well as other national targets.

Terrestrial Areas and Inland Water

The proportion of lands and inland waters conserved in Canada is currently 10.5%. In order to meet the targeted 17% under Target 1 by 2020, significant efforts will be required. In early 2017, federal, provincial, and territorial Ministers responsible for parks, protected areas, and biodiversity conservation launched a national initiative to coordinate and accelerate efforts to achieve the terrestrial areas and inland water component of Canada Target 1. The Pathway to Canada Target 1 initiative is engaging all levels of governments, Indigenous peoples, industries, conservation organizations, and Canadians, to support effort to achieve Target 1 by the end of 2020 and to establish a connected network of protected and other conserved areas throughout the country that will provide a natural legacy for generations of Canadians to come.

The Pathway to Canada Target 1 initiative has been designed to reflect renewed relationships that respect the rights, responsibilities, and priorities of Indigenous peoples, and establish collaborative partnerships in every aspect of the initiative.

Two advisory committees, a National Advisory Panel and an Indigenous Circle of Experts, were established to provide advice and recommendations on how to achieve Canada Target 1. The National Advisory Panel was mandated to provide advice on how governments, non-governmental organizations

and Canadians could collectively achieve Canada Target 1 through a coordinated and connected network of protected and conservation areas throughout the country. The Indigenous Circle of Experts developed recommendations on how a spectrum of Indigenous protected and conserved areas could be realized in Canada and contribute toward Canada Target 1 in the spirit and practice of reconciliation.

Participants in the Pathway initiative recognize that in addition to establishing new protected and conserved areas, efforts must proceed in ways that demonstrate a shift from past practices to ones that more fully recognize Indigenous peoples as essential partners who have a shared interest in conserving lands and waters for future generations. Governments agree that actions should be taken to ensure that all conserved areas are managed equitably, especially in the spirit and practice of reconciliation with Indigenous peoples.

The Government of Canada announced in March 2018 that it would invest $1.35 billion in conservation through A Nature Legacy for Canada. Within the Legacy is a $500 million Nature Fund, which includes significant resources for implementing the Pathway. (There is a separate entry in Section II of the report on the Nature Legacy of Canada and a separate entry in Section IV on the Nature Fund on Aichi Target 3.)

In June 2018, federal, provincial and territorial Ministers responsible for the Pathway met for a second consecutive year to strengthen their commitment to working collaboratively on conservation issues. Informed by the National Advisory Panel, and the Indigenous Circle of Experts under the Pathway to Canada Target 1 initiative, federal, provincial and territorial Ministers committed to work together towards Canada Target 1, and ensure that Canada's network of conserved areas effectively contribute to safeguarding biodiversity. Ministers agreed that recommendations from the National Advisory Panel and input provided by Indigenous peoples, particularly the Indigenous Circle of Experts, will help inform Canada's conservation actions that contribute towards achieving Canada Target 1.

Canada's provincial and territorial governments are responsible for administering the vast majority of public land in Canada. Consequently, achieving Target 1 will depend in part on the efforts of these sub-national jurisdictions. Provinces and territories are pursuing measures within their borders that will contribute to achieving Target 1, including strategies or system plans with the following area-based conservation targets:

- Nova Scotia has committed to increasing the amount of protected areas to 13% of the province;
- Prince Edward Island has committed to protecting 7% of its province;
- Quebec has committed to protecting 17% of the terrestrial and inland water areas and 10% of its marine areas; and
- Saskatchewan has committed to protecting 12% in each of 11 ecoregions.

***Note**: Québec has taken note of the 2020 Biodiversity Goals and Targets for Canada, but has not adhered to them because, by virtue of its responsibilities, it develops its own instruments to implement the UN Convention on Biological Diversity and to contribute to the achievement of the Aichi Targets. Québec sets its own conservation priorities and timelines on its territory, and collaborates with the federal government and the provinces and territories when deemed necessary. Québec does not participate directly in the Pathway to Canada Target 1 initiative but contributes to the pan-Canadian effort by*

achieving an identical target for the creation of protected areas on its territory and its inland water by 2020.

Marine and Coastal Areas

In June, 2016 the Government of Canada identified foundational principles and a five point plan to meet the marine component of the target. Canada's approach to reaching 10% protection by 2020 includes: completing the establishment of Marine Protected Area (MPA) processes that were underway across a range of Canadian federal MPA instruments prior to June 2016; protecting large offshore areas; protecting areas under pressure from human activities, for example through MPA network development in bioregions, which include unique and representative marine ecosystems; advancing OECMs; and pursuing legislative amendments to allow for interim protection of areas following initial scientific analysis and consultations. The three foundational principles that guide this plan are: science-based decision making; transparency; and advancing reconciliation with Indigenous peoples.

National consultation with provincial and territorial governments, Indigenous organizations, industry groups, environmental organizations, and other partners and stakeholders is central to the Government of Canada's plan to meet its marine conservation targets. Partners and stakeholders have been, and will continue to be, engaged throughout the stages of MPA and OECM establishment. They are also engaged in MPA network development processes currently underway in five priority bioregions within Canada's oceans. Engagement and consultation take place through various mechanisms, including bi-lateral meetings, working groups, and advisory committees.

MPAs can be established under a variety of different federal, provincial, and territorial legislation or regulations, depending on the managing jurisdiction. OECMs in Canada's oceans are managed areas that meet science-based marine OECM criteria developed by the Government of Canada. The criteria were, and will continue to be, informed by consideration of ongoing international efforts to define OECMs. To date, the areas that qualify as OECMs in Canada's oceans are fisheries area closures. Fisheries area closures that meet Canada's marine OECM criteria are known domestically as "marine refuges".

For the implementation measure, please indicate to which national or Aichi Biodiversity Target(s) it contributes

- Canada Targets 1 and 15
- Aichi Target 11

Assessment of the effectiveness of the implementation measure taken in achieving desired outcomes

☐ Measure taken has been effective
☒ Measure taken has been partially effective
☐ Measure taken has been ineffective
☐ Unknown

Please explain the selection and where possible indicate the tools or methodology used for the assessment of effectiveness above

Terrestrial Areas and Inland Water

Between 2010 and 2017, the amount of terrestrial and inland water protected in Canada grew by over 100,000 km^2, increasing the percent of Canada's terrestrial area protected from 9.5% to 10.5%. More than one million square kilometres of terrestrial area and inland waters are protected, an area equivalent to that of Germany and France combined.

Ninety five percent of Canada's protected areas are managed by federal, provincial or territorial governments. Of that, the federal government administers or jointly administers about 45% of Canada's terrestrial protected area. Indigenous peoples have contributed to the establishment of tens of thousands of square kilometres of conserved areas through processes embedded in comprehensive land-claim agreements. Indigenous peoples share in the management of many protected areas. Privately conserved areas make an important contribution to Canada's system of conserved areas though they are not currently consistently reported in Canada's protected area reporting. These areas often protect sensitive and significant natural habitat in developed or fragmented landscapes and are almost exclusively in southern Canada.

The growth in protection of terrestrial and inland water areas in recent years is attributed to contributions from federal, provincial, territorial, and local governments, as well as from Indigenous peoples and private landowners. Examples include:

- Wehexlaxodıale, covering an area of 976 km^2 in Northwest Territories, was established in 2013 through the Tłı̨chǫ Land Use Plan Act and is governed by the Tłı̨chǫ Government.
- The province of Nova Scotia set aside land to establish two new Wilderness Areas in collaboration with Nova Scotia Nature Trust, in 2015, protecting an area of approximately 32 km^2.
- The Government of Manitoba government designated Goose Islands and Grand Island provincial parks on June 16, 2017. Located in the northern basin of Lake Winnipegosis, these islands are characterized by a range of habitats including mud flats, marshes, cliffs, ridges and mixed wood forest stands. These habitats support a diversity of wildlife species and in particular they provide important nesting habitat for double-crested cormorants, Caspian terns, common terns, ring billed gulls, herring gulls and American white pelicans.
- The Government of Alberta expanded the boundaries of Castle Wildland Provincial Park and finalized the boundaries of the new Castle Provincial Park, bringing one of the most biologically diverse areas in Alberta under provincial protection. The Castle area is home to over 200 rare or at-risk species located on the eastern slopes of the Rocky Mountains in southern Alberta, near British Columbia and Montana.
- In May 2018, the Government of Alberta announced the largest contiguous area of boreal protected land in the world through the creation of the Kazan, Richardson and Birch River as well as the expansion of Dillon River and Birch Mountains wildland provincial parks. In total, these northern Alberta parks, which adjoin the Wood Buffalo National Park, contribute more than 13,600 km^2 to the province's protected area network.

- Parks Canada expanded its system of protected areas through the establishment of three new National Parks (Nááts'ihch'oh, Qausuittuq, Mealy Mountains), and the Rouge National Urban Park. Together, these additions protect more than 26,500 km^2 of land in the Northwest Territories, Nunavut, Labrador, and Ontario, respectively.
- In October 2018 the Minister of Environment and Climate Change signed an establishment agreement with the Decho First Nations to establish the Edéhzhíe Indigenous Protected Area, contributing over 14,000 km2 to the conservation of Canada's nature.

The Pathway to Canada Target 1 initiative is ongoing and its impact in helping Canada meet Target 1 is expected to be positive but is not yet known. It is clear, however, that the initiative has been effective in a number of its objectives including bringing a broadened set of conservation partners together and developing a common set of collective actions to help achieve the target. The Pathway initiative has resulted in proposed pan-Canadian definitions of IPCAs and OECMs aligned with international guidance. The new conservation partnerships opportunities offered through the Pathway initiative combined with the proposed definitions of OECMs and IPCAs have positioned Canada favourably to achieve progress in the terrestrial and inland water component of the target.

The Canada Nature Fund, which includes a significant investment to support the Pathway to Canada Target 1 initiative such as the establishment of additional protected and conserved areas, will make a significant contribution to Canada's progress.

Marine and Coastal Areas

Canada has progressed significantly since 2015 with respect to conserved area coverage in marine and coastal areas. At the end of 2015, Canada had conserved around 1% of its marine territory. Recently, Canada surpassed its interim target of 5% protection by 2017. At the end of December, 2017, approximately 442,926 km^2 (7.7%) of Canada's marine and coastal areas were conserved. As of June 2018 this is estimated to have increased to 7.9%, indicating that Canada is on track to meet its 10% target by 2020. Canada has engaged broadly with partners and stakeholders in making progress toward the target and in developing domestic guidance on marine OECMs.

Canada's growth in marine conservation has been accomplished through the establishment of MPAs and OECMs. Some examples include, but are not limited to:

- Anguniaqvia niqiqyuam MPA (ANMPA) in the Northwest Territories. This MPA was established in November 2016 and contributes 2,358 km^2 (0.04%) of protected marine area. The area was established in cooperation with the Inuvialuit through processes embedded in the *Inuvialuit Final Agreement* (1984). The ANMPA has been identified as ecologically important by both science and Inuvialuit traditional knowledge. The ANMPA is also culturally important for the Inuvialuit, as it supports subsistence harvesting of Arctic char, beluga, birds and other species by the community of Paulatuk, Northwest Territories. ANMPA will continue to be managed collaboratively with the Inuvialuit and the Inuvialuit Fisheries Joint Management Committee.
- Western/Emerald Banks Conservation Area (restricted fisheries zone) off of Nova Scotia. This marine refuge was established in 2017 and contributes 10,234 km^2 (0.18%) of conserved marine area. The Western/Emerald Banks area contains a complex benthic shelf habitat and is a significant spawning and nursery ground for haddock. Groundfish (multiple species) have been

identified as regionally important from both ecological and economic perspectives. Many species are currently considered to be depleted or have been assessed as at-risk. All commercial and recreational fisheries using bottom-contact gear and/or gear known to interact with groundfish are prohibited in the Western/Emerald Banks area.

- Interim protection for Tallurutiup Imanga National Marine Conservation Area, in Lancaster Sound, Nunavut was announced in 2017 by the Government of Canada and the Qikiqtani Inuit Association. The area will be formally established under the Canada National Marine Conservation Areas Act, but in the interim, all mining, petroleum and seismic activities are presently prohibited. The NMCA protects 109,000 km^2 of Arctic waters and reflects the wishes of Inuit communities to protect an area that has sustained their culture for millennia. Tallurutiup Imanga is an area of critical ecological importance to numerous seabird species and marine mammals, including seals, narwhal, beluga and bowhead whales, as well as walrus and polar bears, as well as being an important traditional hunting ground for several Inuit communities. The area will be established pursuant to an agreement with the Qikiqtani Inuit Association as required by the Nunavut Land Claims Agreement (1993).
- In June 2018, the Scott Islands marine National Wildlife Area was established, contributing 11,546 km^2 towards to the conservation one of the most diverse marine ecosystems on Canada's Pacific coast.

Relevant websites, web links and files

- Canada's Protected Areas: https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/conserved-areas.html
- Canadian Protected Areas Status Report 2012 to 2015: https://www.canada.ca/en/environment-climate-change/services/wildlife-habitat/publications/protected-areas-report-2012-2015/table-contents.html
- Conservation 2020 Pathway to Canada Target 1: http://www.conservation2020canada.ca/
- Canada's Marine Conservation Targets: http://dfo-mpo.gc.ca/oceans/conservation/index-eng.html
- 5 Percent Interim Target Achieved: http://www.dfo-mpo.gc.ca/oceans/conservation/achievement-reussite-eng.html
- National Marine Conservation Areas: http://www.pc.gc.ca/en/amnc-nmca/
- Current National Wildlife Areas: https://www.canada.ca/en/environment-climate-change/services/national-wildlife-areas/locations.html
- Marine Protected Areas (MPAs) and their regulations: http://www.dfo-mpo.gc.ca/oceans/mpa-zpm/index-eng.html
- List of marine refuges: http://www.dfo-mpo.gc.ca/oceans/OECM-amcepz/refuges/index-eng.html
- News Release on Manitoba's New Provincial Parks and Protected Islands: http://news.gov.mb.ca/news/index.html?archive=&item=41595
- News Release on Expanded Provincial Parks in Alberta: https://www.alberta.ca/release.cfm?xID=4615062300B72-B7DC-7610-C46E08357654B8F9
- News Release on Expanded Boreal Provincial Parks in Alberta: https://www.alberta.ca/release.cfm?xID=55951F7FBFC21-B342-F69F-2BB2163D213E56F7

- News Release on Establishment of Scott Islands marine National Wildlife Area: https://www.canada.ca/en/environment-climate-change/services/national-wildlife-areas/locations/scott-islands-marine.html

Other relevant information

Protected areas and OECMs in Canada can be established nationally (federally) or by provincial, territorial, Indigenous, or municipal governments, private landowners, conservation land-trusts or other non-government organizations. Protected areas are found in each of Canada's ten provinces and three territories as well as in all three oceans. The distribution of this protection varies across the country. For example, Canada is comprised of 18 terrestrial ecozones, 12 marine ecozones (referred to domestically as bioregions) and one freshwater ecozone, with a conserved area ranging from 0.02% to 28.1% as of December 2017.

Relevant websites, web links and files

- Canada's Protected Areas: https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/conserved-areas.html

Obstacles and scientific and technical needs related to the measure taken

The Canadian Protected Areas Status Report (2012-2015) identified several challenges with respect to the availability of information and resources to support protected area design in marine areas. Half of the Canadian jurisdictions that establish MPAs reported gaps in spatially explicit wildlife data, and also identified limited or unavailable information on Indigenous knowledge. More than half of the jurisdictions identified a lack of inventory and monitoring data, and information on stress assessments and indicators. Other main obstacles identified in the Protected Areas Status Report for the marine environment included limited human resources and competing interests associated with potential protected area sites.

Common obstacles were experienced by jurisdictions in establishing terrestrial protected areas, including limited spatially explicit wildlife data, inventory data, monitoring data, and Indigenous knowledge, competing interests associated with potential protected area sites, and limited human resources. Obstacles also included difficulties in finding suitable lands, and limited capacity of partners and communities to engage in the establishment process. However, most Canadian jurisdictions invest significant resources in obtaining the information required to assist the establishment of protected areas.

Canada is committed to collaborating with Indigenous groups in identifying important areas for conservation, and establishing and managing protected areas and OECMs. This includes appropriately seeking access to Indigenous knowledge as part of engagement and consultation processes.

Establishing protected areas and OECMs also relies on engagement and consultation with other resource users and knowledge holders, including local communities, industry groups, and environmental groups. These processes help to validate and supplement data sets, so that the best available information can be used to support decision-making.

Relevant websites, web links and files

- Canadian Science Advisory Secretariat (CSAS): http://www.dfo-mpo.gc.ca/csas-sccs/index-eng.htm
- Canadian Protected Areas Status Report 2012 to 2015 Chapter 2 Section 15: https://www.canada.ca/en/environment-climate-change/services/wildlife-habitat/publications/protected-areas-report-2012-2015/chapter-2.html#_2
- Canadian Protected Areas Status Report 2012 to 2015 Chapter 2 Section 16: https://www.canada.ca/en/environment-climate-change/services/wildlife-habitat/publications/protected-areas-report-2012-2015/chapter-2.html#_2_16

Describe a measure taken to contribute to the implementation of your country's national biodiversity strategy and action plan

General Status of Species in Canada

Canada is a large country and home to thousands of species. The first step in preventing the loss of species is to know which species there are in Canada, where they occur and what their status is. The mandate of the program on the General Status of Species in Canada is to provide this overview. The main product of the program is the report series *Wild Species: The General Status of Species in Canada*. The Wild Species reports represent the most comprehensive look at the state of Canada's species and contain the general status assessments for a broad cross-section of species, from all provinces, territories and ocean regions. Originating from collaboration between all provincial and territorial governments in Canada and the federal government, reports from the Wild Species series represent a huge accomplishment that summarizes the monitoring efforts of species in the country. The Wild Species reports are released every five years. The most recent report, Wild Species 2015, is now available and represents the fourth report of the series, after the 2000, 2005, and 2010 editions. In this report, the conservation status of about 30,000 species was assessed, a major increase relative to the 2010 report in which about 12,000 species were assessed. The 2020 report is currently in preparation and is anticipated to cover nearly 40,000 species. This series embodies the commitment of all Canada's ministers responsible for wildlife under the Accord for the Protection of Species at Risk.

For the implementation measure, please indicate to which national or Aichi Biodiversity Target(s) it contributes

- Canada Target 2
- Canada Target 14
- Aichi Target 12
- Aichi Target 19

Assessment of the effectiveness of the implementation measure taken in achieving desired outcomes

☒ Measure taken has been effective
☐ Measure taken has been partially effective
☐ Measure taken has been ineffective
☐ Unknown

Please explain the selection and where possible indicate the tools or methodology used for the assessment of effectiveness above

The Wild Species reports bring attention to various groups of species. For example, the Wild Species 2015 report covered a significant portion of Canada's biodiversity; new groups of marine species were assessed and several large groups of insects were also added. A particular focus on pollinators was also made. The methodology used to assess the conservation status of species is the same as all provincial and territorial governments in Canada, and is based on the NatureServe international approach. This enables a good integration of the results, and thus helps all governments to inform decisions on species at risk.

Relevant websites, web links and files

- Wild Species: www.wildspecies.ca

Other relevant information

In the Wild Species 2015 report, the conservation status of 29,848 species has been assessed in Canada among 34 different taxonomic groups: selected macrofungi, macrolichens, bryophytes, vascular plants, sponges, corals, freshwater bivalves, terrestrial and freshwater snails and slugs, spiders, mayflies, dragonflies and damselflies, stoneflies, grasshoppers and relatives, lacewings, beetles, ants, bees, yellowjacket wasps, caddisflies, moths and butterflies, scorpionflies, black flies, mosquitoes, horse flies, bee flies, flower flies, decapods, sea cucumbers, sea urchins, fishes, amphibians, reptiles, birds, and mammals. Results indicate that the majority of species in Canada are secure. The ongoing reports will enable assessment of whether these species continue to remain secure.

Obstacles and scientific and technical needs related to the measure taken

Canada is home to an estimated 80,000 species (excluding viruses and bacteria). Some taxonomic groups currently have a level of knowledge too low to be considered for inclusion in the Wild Species reports. For example, there are many groups of invertebrates that are unable to have a species list in Canada. There are other species that are known to occur in Canada, but for which there is a lack of data to assess their conservation status. In the future, the Wild Species series will continue to consolidate Canada's knowledge of species.

Relevant websites, web links and files

- Wild Species: www.wildspecies.ca

Describe a measure taken to contribute to the implementation of your country's national biodiversity strategy and action plan

North American Waterfowl Management Plan

In 1986, the Canadian and United States governments signed an international partnership agreement, the North American Waterfowl Management Plan (NAWMP), laying the foundation for international cooperation to conserve continental waterfowl populations and habitat. Mexico became a signatory to the Plan in 1994. As a result, the NAWMP partnership extends across North America, working at national and regional levels on a variety of waterfowl and habitat management issues. The NAWMP works with private landowners and governments to help reduce the rate of loss and degradation by protecting wetlands, establishing conservation agreements, and influencing stewardship activities of landowners, farmers, land managers and conservation agencies. Protected areas, established by governments, and other types of conservation areas established by private land owners, conservation organizations, and local communities, have preserved millions of hectares of wetlands.

Public-private "Joint Venture" partnerships collectively implement the goals of NAWMP in Canada. There are four Habitat Joint Ventures (Canadian Intermountain, Eastern, Pacific Birds, and Prairie) and three Species Joint Ventures (Arctic Goose, Black Duck and Sea Duck) in Canada. The Habitat Joint Ventures integrate planning, science, governance, partnerships, and management to achieve NAWMP goals in Canada. Species Joint Ventures are international in scope, spanning North America and including circumpolar countries. These joint ventures focus on critical science needs to inform the management of over 20 species and their related habitats. Additionally, research directed through the species joint ventures addresses questions for other bird species that share the habitats.

For the implementation measure, please indicate to which national or Aichi Biodiversity Target(s) it contributes

- Canada Target 3
- Aichi Target 5

Assessment of the effectiveness of the implementation measure taken in achieving desired outcomes

☒ Measure taken has been effective
☐ Measure taken has been partially effective
☐ Measure taken has been ineffective
☐ Unknown

Please explain the selection and where possible indicate the tools or methodology used for the assessment of effectiveness above

Indicator used to track progress under Target 3 is the cumulative habitat area retained, restored, and managed under the North American Waterfowl Management Plan.

Between 1986 and March 31, 2017, 8.5 million hectares of wetlands and associated uplands have been retained in Canada under the auspices of NAWMP, and 6.6 million hectares have been restored and/or managed.

Relevant websites, web links and files

- Canadian Habitat Matters - NAWMP Annual Reports: http://nawmp.wetlandnetwork.ca/publications/

Other relevant information

Canada publishes Habitat Matters, an annual report on NAWMP, which showcases the ongoing efforts undertaken by the Habitat and Species Joint Ventures to achieve abundant and resilient waterfowl populations and sustainable landscapes in Canada. The examples below highlight some of the recent achievements. For more examples, see the relevant websites, web links, and files for the link to the website to see the list of Habitat Matters online publications that date back over a decade.

In the Pacific Birds Habitat Joint Venture, the Nature Conservancy of Canada added the Clayoquot Island Preserve (38 hectares) to its conservation portfolio in 2015. Situated within the Clayoquot Sound UNESCO Biosphere Reserve, the island is an ecologically rich mosaic, including beaches and intertidal areas that support two important habitats for conservation: coastal sand dunes and eel-grass beds. Clayoquot Island is an important migratory stopover for the hundreds of Brant geese that feed and rest on the sandspit in the early spring.

In 2017, Canadian Intermountain Joint Venture partners, Ducks Unlimited Canada and the Nature Conservancy of Canada acquired a 36 hectare property along the Okanagan River in British Columbia. The property lies in an expanse of wetlands known as the Osoyoos oxbows. The property contains some of the last remaining marshes in an area that was once a significant chain of wetlands. Plans to restore the land to more natural wetlands are underway.

In 2016, in the western boreal forest part of the Prairie Habitat Joint Venture, the Government of Saskatchewan approved a forest company's 20-year forest management plan that includes the protection of habitat for Woodland Caribou and other wildlife totalling approximately 207,000 hectares, of which approximately 80% are wetlands.

Since 2013, Ducks Unlimited Canada and other Prairie Habitat Joint Venture partners have been working together to restore Manitoba's Delta Marsh, one of the world's largest marshes, covering 190 km^2 along the southern shore of Lake Manitoba. A number of factors contributed to the marsh's decline over the past 50 years including aquatic invasive species such as a hybrid cattail and the highly destructive common carp. Currently, Ducks Unlimited Canada is leading a multiyear initiative to address additional causes of decline of the ecological health of the marsh.

The ecological richness of the Musquodoboit Estuary in Nova Scotia led to the 1987 designation of the 1,925 hectares outer estuary as a Wetland of International Importance under the Ramsar Convention and its recognition as an Important Bird Area. Since that time, 600 hectares of the privately owned coastal islands and intertidal habitats within the Ramsar site have been acquired by Eastern Habitat Joint Venture partners such as the Nova Scotia Department of Natural Resources and the Nature Conservancy of Canada, which helps ensure the protection of these lands forever. The area is home to significant populations of waterfowl, other birds and marine life.

Relevant websites, web links and files

- Canadian Habitat Matters – Canadian NAWMP Annual Reports: http://nawmp.wetlandnetwork.ca/publications/

Obstacles and scientific and technical needs related to the measure taken

Despite NAWMP's success, wetland loss in Canada continues. Land use decisions related to agriculture, urban development, energy and other sectors often have direct and indirect consequences for waterfowl and other wildlife. Waterfowl hunters were a traditional source of revenue for habitat conservation programs through the purchase of a conservation stamp affixed to their permits. Declining numbers of hunters have meant a reduction in this funding source.

The NAWMP Revision 2012 – People Conserving Waterfowl and Wetlands addresses the continuing loss of habitat, management of waterfowl populations, and engaging people who value waterfowl and wetlands. The latter is a new approach to including a human dimension factor into achieving the overall increases of waterfowl and wetlands (NAWMP 2012 Plan, Goal 3: Growing numbers of waterfowl hunters, other conservationists and citizens who enjoy and actively support waterfowl and wetlands conservation).

Traditional (e.g. waterfowl hunters) and non-traditional (e.g. birdwatchers) support is essential to sustain waterfowl conservation. A shift from rural to urban residences, high turnover rate among user segments, and an aging population are key sources of concern. Undoubtedly, different engagement strategies will be required in different regions of the continent to address regional demographics, hunting traditions, perspectives about wetlands and waterfowl, and other social characteristics.

Notable advances resulting from the 2012 Plan include the formalization of a Human Dimensions Working Group operating at the continental level. Under the Human Dimension Working Group, rigorous social science surveys are underway in Canada to inform future revisions of NAWMP objectives. They will help to understand the users' attitudes, behaviours, priorities, and characteristics in participation in nature-based activities and conservation priorities. Furthermore, the proposed research will produce knowledge that can inform consumptive and non-consumptive activities management policies.

Relevant websites, web links and files

- 2012 North American Waterfowl Management Plan: https://nawmp.org/
- NAWMP Action Plan: http://www.nawmprevision.org/content/action-plan-completed/

Describe a measure taken to contribute to the implementation of your country's national biodiversity strategy and action plan

Raising awareness and building capacity to address biodiversity concerns at the local level

ICLEI – Local Governments for Sustainability is a not-for-profit, non-government organization that works with local governments in Canada to raise awareness and build capacity to address biodiversity concerns at the local level. Capacity building is at the core of their biodiversity work to empower the local level with the knowledge, tools and resources they need to integrate biodiversity management into their sustainability planning. ICLEI Canada's approach follows a three-pronged methodology:

- **Awareness-raising**
  ICLEI Canada continuously highlights the achievements of local governments in the field of biodiversity conservation and management by sharing best practices through case studies, webinars, presentations, and informational packages.
- **Networking**
  ICLEI Canada helps to create platforms to exchange experiences, challenges and opportunities communities face on a day-to-day basis. By developing conferences, sessions, and workshops, the organization bring together key stakeholders and offer networking and engagement opportunities.
- **Resource Development**
  ICLEI Canada is connected to the international environmental community and is able to develop hands-on, comprehensive resources tailored to Canadian local governments and practitioners.

For the implementation measure, please indicate to which national or Aichi Biodiversity Target(s) it contributes

- Canada Target 4
- Aichi Target 2

Assessment of the effectiveness of the implementation measure taken in achieving desired outcomes

☐ Measure taken has been effective
☒ Measure taken has been partially effective
☐ Measure taken has been ineffective
☐ Unknown

Please explain the selection and where possible indicate the tools or methodology used for the assessment of effectiveness above

There has been a small but growing trend in municipalities to prioritize the protection of biodiversity in their communities, resulting in the development of more policies, strategies and projects that protect biodiversity. Surveys ICLEI Canada have conducted demonstrate this trend. However, there has not been widespread uptake of biodiversity prioritization at the municipal level due to limits of empowerment, capacity and resources. Municipalities need empowerment to act on biodiversity through clear collaboration and prioritization with their federal, provincial and territorial partners. In doing so, resource allocation can follow, along with the development of resources and training to support these activities.

Relevant websites, web links and files

- ICLEI Canada, (2015).*Handbook for Municipal Biodiversity Planning and Management*: http://icleicanada.org/images/BiodiverCITIES_Handbook_Final_small.pdf

- ICLEI Canada and TRCA, (2014). *Biodiversities: A Primer on Nature in Cities*: http://icleicanada.org/images/icleicanada/pdfs/biodiverCities_A%20Primer%20on%20Nature%20in%20Cities.pdf
- ICLEI Canada (2013). *Cities and Biodiversity: Exploring how Edmonton and Montréal are Mainstreaming the Urban Biodiversity Movement*: http://icleicanada.org/images/icleicanada/pdfs/Biodiversity_CaseStudy_EdmontonMontreal.pdf

Biodiversity was featured in two specific sessions at the last Livable Cities Forum in Victoria in September 2017. Descriptions of the sessions are below.

- http://www.livablecitiesforum.com/program/
    - Blue, Green, and Gray Infrastructure:
      Integrated Solutions for Low Carbon Resilience:
      Learn about innovative ways that blue, green, and grey infrastructure have been used to meet challenges in urban water management. This session will explore how the three shades of infrastructure can be integrated, merged, and optimized to improve low carbon resilience along with several other co-benefits.
    - Integrating Ecology and Nature into Low Carbon Resilience:
      What is the interaction between biodiversity, resilience, and climate change? What is the role of the natural environment in building low carbon and resilient communities? This session will explore case studies of organizations and initiatives that work to integrate ecology into resilience and low carbon planning, as well as the multiple co-benefits of doing so.

Obstacles and scientific and technical needs related to the measure taken

The primary obstacle to biodiversity work at the municipal level centres around empowerment. Municipalities face a number of competing priorities that affect biodiversity, from land development pressures to recreation pressures on natural spaces. Action to protect biodiversity is largely voluntary, so competing priorities often win. Clear collaboration and prioritization of objectives with federal, provincial and territorial counterparts could provide the empowerment municipalities need to act towards protecting biodiversity.

In addition, municipalities need the resources and training to support acting on biodiversity. There are funding and capacity building programs to support local governments in Canada to work on sustainability planning, climate mitigation, climate adaptation, brownfield development etc. By creating funding and capacity building programs, municipalities can collaborate, innovate and cumulatively have a greater impact towards Canada's national biodiversity targets.

Describe a measure taken to contribute to the implementation of your country's national biodiversity strategy and action plan

Making progress toward achieving Canada Target 5

Efforts across multiple jurisdictions and sectors are well underway to meet *Target 5: By 2020, the ability of Canadian ecological systems to adapt to climate change is better understood, and priority adaptation measures are underway*, this includes the completion of multiple assessments of the vulnerability of ecological systems and biodiversity to climate change including for priority areas and species of greatest concern. Additionally, a number of strategic, management, land use and development plans have been completed and implemented to facilitate and enhance the resilience of species and areas of greatest concern. The measures featured here explicitly address adaptation *by ecosystems*, as this is the focus of Canada Target 5.

The *Pan-Canadian Framework on Clean Growth and Climate Change* is Canada's plan – developed with the provinces and territories and in consultation with Indigenous peoples – to meet emissions reduction targets, grow the economy, and build resilience to a changing climate. The framework's adaptation pillar recognizes that ecosystems support adaptation by human communities through providing nature-based solutions, for example in sequestering carbon and providing infrastructure outcomes.

The Government of Canada is working with First Nations, the Métis Nation and Inuit on a distinctions-basis via senior level tables to support the implementation of the Pan-Canadian Framework. These permanent tables offer an opportunity to meaningfully involve Indigenous peoples in shaping approaches that position them as leaders of climate action.

In January 2018 the Government of Canada adopted a Federal Climate Change Science Plan to strategically accelerate the delivery of the science needed to inform climate change actions as outlined in the Pan-Canadian Framework. One of its five core action plans focuses on "resilient regions and communities" and will contribute to meeting the objectives of Canada Target 5.

See the assessment of progress on Canada Target 5 in section III of this report for details about adaptation progress under the Pan-Canadian Framework and related initiatives that support this target.

For the implementation measure, please indicate to which national or Aichi Biodiversity Target(s) it contributes

- Canada Target 5
- Aichi Target 10 and 15

Assessment of the effectiveness of the implementation measure taken in achieving desired outcomes

☐ Measure taken has been effective
☒ Measure taken has been partially effective
☐ Measure taken has been ineffective
☐ Unknown

Please explain the selection and where possible indicate the tools or methodology used for the assessment of effectiveness above

The examples featured in this case of progress towards Canada Target 5 are at varying stages of development and implementation; some are very new. They are important in ongoing efforts to understand how ecological systems adapt to climate change, and in the development of priority measures for ecosystem adaptation. Their continued application, and additional measures, are needed to strengthen progress towards this target.

This evaluation is supported by the completion of multiple assessments of the vulnerability of ecological systems and biodiversity to climate change, including for priority areas and species of greatest concern; and a number of management, land use and development plans have been completed and implemented to facilitate and enhance the resilience of species and areas of greatest concern (*see section III for further details*).

For example, the Canadian Forest Service (CFS) is involved in two major areas of research on this front: (1) understanding the impacts of climate change on forests and the forest sector; and (2) preparing for suitable responses to these impacts. New knowledge gained is helping forest managers plan for ways to reduce the risks and increase the resilience to climate change impacts that are negatively affecting ecosystems and the forest sector. At the same time, it is helping managers optimize what benefits may come from climate change. The CFS is also working with provinces, territories, universities and industry to develop decision support tools for managers and policy-makers.

Forest scientists are developing a range of tools, as identified in the Forest Change adaptation tools, for assessing and managing climate-related risks and adaptation options including by updating Canada's Plant Hardiness Zones to show changes consistent with climate change. Canada's plant hardiness map provides insights about what can grow where. It combines information about a variety of climatic conditions across the entire country to produce a single map.

Several frameworks, guidebooks (e.g., Guidebook on Assessing Vulnerability and Mainstreaming Adaptation into Decision Making) and tools (e.g., Canada's National Forest Inventory) to help forest management practitioners better understand sources of vulnerability and potential ways to adapt. The Guidebook provides a roadmap for the entire adaptation process, from exploring the readiness of an organization to adapt and assessing its vulnerability to current and future climate change, all the way to the implementation and monitoring phase of identified adaptation measures. This framework is being piloted in several case studies across the country. Canada's National Forest Inventory monitors a network of twenty thousand sampling points across Canada on an ongoing basis to provide information on the state of Canada's forests and a continuous record of forest change. It also provides data and products to forest science researchers, forest policy decision-makers and interested stakeholders.

In addition, several working groups and communities of practice exist including the Forestry Adaptation Community of Practice (FACoP), an online community for sharing information and best practices on climate change vulnerability and adaptation in Canada's forest sector; and the Forestry Adaptation Working Group that has the objective to share knowledge and information on climate change adaptation to support resilient forest ecosystems.

Forest managers need to include climate change considerations in long-term planning if Canada is to maintain a competitive position in world markets. This means efforts in the future are required to continue assessing climate effects and identifying ways to adapt forests to ensure a healthy environment, society, and economy. Involving everyone in adaptation efforts—government, industry, academia, the public—will be the most effective approach. Good communication and information exchange will help Canadians address shared problems and pool resources to solve them.

Canada has also been advancing the adaptation of aquatic and coastal ecosystems. The Aquatic Climate Change Adaptation Program, for example, supports monitoring and analysis of the effects that changing ocean conditions is having on Canada's fisheries, aquatic ecosystems, and coastlines. This program examines the state, extent and ecological effects of increasing acidification, hypoxia and freshwater runoff; assesses the vulnerability of fisheries and coastal infrastructure to the impacts of climate change; and refines ocean models to improve forecasting of ocean conditions to better understand and predict future ocean conditions such as water temperature, currents and ocean chemistry.

Canada supports large-scale, long-term monitoring and research programs of selected wildlife species that are used to model and understand the potential impacts of climate change (and other stressors) on distribution and abundance of wildlife species.

For example:

- Environment and Climate Change Canada has been supporting a broad suite of bird population monitoring and research programs, many for more than 50 years. Some of the longest running surveys include the North American Breeding Bird Survey (since 1966) and Christmas Bird Count (since 1900), both relying heavily on Citizen Scientists, and the joint U.S. Fish and Wildlife Service / Canadian Wildlife Service breeding waterfowl surveys (since 1955). Many other surveys fill specific geographic and taxonomic gaps, such as shorebird migration surveys, the Canadian Migration Monitoring Network, seabird colony surveys and helicopter-based surveys of Arctic-nesting shorebirds.

- In addition to bird surveys, Environment and Climate Change Canada has been conducting long term ecological research programs on migratory birds and other wildlife species to gain a better understanding of the impacts of multiples stressors, including climate change, as drivers of population change and on species distribution and abundance. All of these data are used for monitoring population status and have been analyzed for hundreds of scientific publications. Topics relevant to climate change include examining the impacts of weather on migration timing and breeding arrival times; understanding impacts of warmer winters on distribution of wintering species; modelling impacts of prairie drought on duck populations; understanding the impacts of change in ice regimes in Arctic Canada on breeding migratory marine birds; and modelling impacts of change in habitats due to climate change on breeding forest land birds. Data have also been used to examine the impacts of changing climate on nesting success and population trends of Arctic-nesting shorebirds.

Further, in 2017 the Government of Canada launched a five-year project to assess the vulnerability of biodiversity in Great Lakes wetlands under climate change, and to explore methods to mitigate losses in biodiversity and enhance resiliency, as part of the Freshwater Action Plan. The government has been collecting baseline biodiversity and topographic data at 25 wetlands from the St. Lawrence River through Lake Superior. Using contemporary Great Lakes-specific climate forecasts, the response of the wetlands will be modeled while accounting for their adaptive capacity under the extremes of climate change. This will help inform the development of adaptive measures that enhance resiliency.

Some jurisdictions in Canada are monitoring and tracking progress towards meeting this target. However, no national monitoring system is in place. Having this system in place could improve monitoring of progress and would support better assessment of the effectiveness of implementation in the future.

Additional scientific research and analysis on climate change is undertaken in Canada by governments, academia, and elsewhere. Improved understanding of climate change is essential to understanding the ability of ecosystems and biodiversity to adapt.

Relevant websites, web links and files

- Pan-Canadian Framework on Clean Growth and Climate Change website: https://www.canada.ca/en/services/environment/weather/climatechange/pan-canadian-framework/climate-change-plan.html
- Background on Government-Indigenous engagement on Pan-Canadian Framework implementation: https://pm.gc.ca/eng/news/2016/12/09/process-document-ongoing-engagement-pan-canadian-framework-clean-growth-and-climate
- Forestry Adaptation Group, Adaptation Platform Working Groups: http://www.nrcan.gc.ca/environment/impacts-adaptation/adaptation-platform/17176
- Forest Change adaptation tools: http://www.nrcan.gc.ca/forests/climate-change/tools-resources/17770
- Plant Hardiness Zones: http://planthardiness.gc.ca/
- Forestry Adaptation Community of Practice (FACoP): https://www.ccadaptation.ca/en/facop
- CCFM Review of Assisted Tree Migration: http://www.ccfm.org/pdf/CCFM Assisted Tree Migration November 2014 English FINAL.pdf
- Aquatic Climate Change Adaptation Program: http://www.dfo-mpo.gc.ca/science/oceanography-oceanographie/accasp-psaccma/index-eng.html

Obstacles and scientific and technical needs related to the measure taken

There is no national plan or collaborative monitoring network to track progress related to the ability of ecological systems in Canada to adapt to climate change impacts. By creating a dedicated plan and collaborative network related specifically to supporting ecosystems and biodiversity to adapt to climate change could have a greater impact towards Canada's national biodiversity targets. This would lead to a more comprehensive picture of the actions ongoing across the country and at multiple levels and could assist in identifying gaps for more dedicated work in future to address hotspots, key issues or concerns.

Describe a measure taken to contribute to the implementation of your country's national biodiversity strategy and action plan

Boreal forest research: What we know about Canada's Boreal Forest

In Canada's boreal zone, resource development – forestry, mining, oil and gas, and hydroelectricity – is expanding into new areas. These activities can result in varying types and degrees of pressures for the resilience of forests, lakes, rivers and wetlands that make up this ecological region and support large industries. Canada's boreal forest resources are a major part of the country's cultural and economic wealth, and they are potentially an important contributor to a low carbon economy. Discussions about environmental stewardship of Canada's boreal forest focus on how resource development and management are affecting the health and sustainability of boreal ecosystems.

Understanding natural processes and drivers of change requires detailed scientific knowledge. With that in mind, the Canadian Forest Service of Natural Resources Canada led an initiative involving more than 60 scientists from the department, provinces, territories, academia, and elsewhere in order to complete a series of review papers that synthesize more than 4000 science publications related to the boreal zone and its ecosystems. The goal was to summarize the current state of scientific knowledge about the boreal and make it available to those responsible for managing boreal ecosystems and natural resource development.

The conclusions of that large review are outlined in Natural Resource Canada's Boreal forest research presented in 11 articles, which together provide a comprehensive summary of the scientific evidence of the impacts of human development, resource use and climate change on terrestrial and aquatic ecosystems in the boreal zone of Canada.

For the implementation measure, please indicate to which national or Aichi Biodiversity Target(s) it contributes

- Canada Target 6
- Canada Target 14
- Aichi Target 4

Assessment of the effectiveness of the implementation measure taken in achieving desired outcomes

☒ Measure taken has been effective
☐ Measure taken has been partially effective
☐ Measure taken has been ineffective
☐ Unknown

Please explain the selection and where possible indicate the tools or methodology used for the assessment of effectiveness above

For Canada, the cumulative effects of human development and natural events on the boreal zone are a concern. In the absence of sustainable practices, industries such as mining and forestry can impact the health of the boreal forest.

Scientific knowledge – such as that collected in the 4000-publication synthesis – provides the objective, factual basis needed to support decisions that will continue to maintain healthy and sustainable boreal

ecosystems. And the more detailed the picture of Canada's boreal zone can be, the better able policy-makers will be to work toward balancing the social, economic and environmental goals for the region.

Four questions framed the Canadian Forest Service review of current scientific knowledge about the boreal zone:

1. What are the effects of resource management on boreal ecosystems?
2. How do we know if the boreal zone and its ecosystems are healthy?
3. To maintain a healthy boreal zone, how much of the zone do we need to protect?
4. How can management practices in the boreal zone be adapted to climate change, and how can they help to mitigate it?

Relevant websites, web links and files

- Canada's Boreal Forest: http://www.nrcan.gc.ca/forests/boreal/17394
- Boreal Forest Research: http://www.nrcan.gc.ca/forests/boreal/17398

Series of articles assesses the health of Canada's boreal zone

Researchers from the Canadian Forest Service of Natural Resources Canada analysed thousands of scientific articles and studies. The 11 papers below summarize the findings of the analyses and assess the current health of ecosystems in Canada's boreal zone:

1. An introduction to Canada's boreal zone: Ecosystem processes, health, sustainability, and environmental issues (2013): http://cfs.nrcan.gc.ca/publications?id=35234
2. Anticipating the consequences of climate change for Canada's boreal forest ecosystems (2013): http://cfs.nrcan.gc.ca/publications?id=35306
3. Canadian boreal forests and climate change mitigation (2013): http://cfs.nrcan.gc.ca/publications?id=35627
4. Carbon in Canada's boreal forest – A synthesis (2013): http://cfs.nrcan.gc.ca/publications?id=35301
5. Climate change vulnerability and adaptation in the managed Canadian boreal forest (2014): http://cfs.nrcan.gc.ca/publications?id=35357
6. Effects of natural resource development on the terrestrial biodiversity of Canadian boreal forests (2014): http://cfs.nrcan.gc.ca/publications?id=35685
7. How do natural disturbances and human activities affect soils and tree nutrition and growth in the Canadian boreal forest? (2014): http://cfs.nrcan.gc.ca/publications?id=35368
8. Impacts and prognosis of natural resource development on aquatic biodiversity in Canada's boreal zone (2013): http://cfs.nrcan.gc.ca/publications?id=35314
9. Non-native species in Canada's boreal zone: diversity, impacts, and risk (2014): http://cfs.nrcan.gc.ca/publications?id=35564
10. Protected areas in boreal Canada: A baseline and considerations for the continued development of a representative and effective reserve network (2014): http://cfs.nrcan.gc.ca/publications?id=35366
11. Impacts and prognosis of natural resource development on water and wetlands in Canada's boreal zone (2015): http://www.nrcresearchpress.com/doi/abs/10.1139/er-2014-0063#.Wmi4mNKWyHs

Describe a measure taken to contribute to the implementation of your country's national biodiversity strategy and action plan

Education and stewardship to create or improve habitat on farmland

Federal-provincial-territorial governments collaboratively provide support for education and stewardship to create or improve habitat on farmland.

Examples:
Canada's Federal-Provincial-Territorial agricultural policy framework provides cost-shared funding to support on-farm environmental risk assessments and accelerate the adoption, by producers, of beneficial management practices (BMPs). Many of these BMPs directly or indirectly support biodiversity on agricultural lands. BMPs include, for example, establishing/managing riparian buffers and woodlots; converting marginal cropland to permanent cover; planting or maintaining shelterbelts and hedgerows; delaying haying; and conserving wetland, wetland buffers, and natural and semi-natural lands.

In addition, federal and provincial environment departments fund regionally-specific on-farm education and action targeted at habitat and management practices for species at risk, for example, the Species at Risk Partnerships on Agricultural Lands initiative.

For the implementation measure, please indicate to which national or Aichi Biodiversity Target(s) it contributes

- Canada Target 7
- Aichi Target 7

Assessment of the effectiveness of the implementation measure taken in achieving desired outcomes

☐ Measure taken has been effective
☒ Measure taken has been partially effective
☐ Measure taken has been ineffective
☐ Unknown

Please explain the selection and where possible indicate the tools or methodology used for the assessment of effectiveness above

The most recent data (2011) on environmental farm planning shows that 35% of farms in Canada had a formal written environmental farm plan. While this represents a 7% increase since the previous assessment in 2006, it nevertheless indicates that there is room to continue to grow. Refer to Section 3 for additional information. The target is monitored using two indicators:

- Wildlife habitat capacity on farmland; and,
- Environmental farm planning on agricultural land

Relevant websites, web links and files

- Canadian Agricultural Partnership: http://www.agr.gc.ca/eng/about-us/key-departmental-initiatives/canadian-agricultural-partnership/?id=1461767369849
- Growing Forward 2: http://www.agr.gc.ca/eng/about-us/key-departmental-initiatives/growing-forward-2/?id=1294780620963

- Species At Risk Partnerships on Agricultural Lands: https://www.canada.ca/en/news/archive/2015/06/species-risk-partnerships-agricultural-lands.html?=undefined&wbdisable=true
- Species At Risk Partnerships on Agricultural Lands – Ontario Soil and Crop Association: https://www.ontariosoilcrop.org/oscia-programs/sarpal/
- Species At Risk Farm Incentive Program: https://www.ontariosoilcrop.org/oscia-programs/sarfip/
- Canadian Environmental Sustainability Indicator, Wildlife habitat capacity on agricultural land: https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/wildlife-habitat-capacity-agricultural-land.html

Other relevant information

Case Study: Beneficial Grazing Practices as part of a Species at Risk Action Plan in Saskatchewan

Canadian grasslands used for cattle grazing provide a range of environmental benefits, such as the conservation of biodiversity. The important role that good grazing practices have in realizing these benefits is recognised within the agricultural community and in action plans to conserve species at risk. This initiative is a collaboration between multiple federal government departments and a private landowner to apply grazing practices that benefit biodiversity over a large area containing both public and privately owned land.

Grasslands National Park (GNP) currently hosts the only two active leks of Greater Sage-Grouse (GRSG) in Saskatchewan. The species is listed as an endangered species under both federal and provincial species at risk legislation. The majority of GRSG population that breeds in GNP is found in the eastern side of the park. Here, birds are reported to use nesting and brood-rearing habitat found within Park land, and on adjacent sections of farm land.

Since 2016, GNP has been working with a local rancher to apply cattle grazing practices that are beneficial to GRSG on Park land, with the objective of optimizing GRSG brood-rearing and nesting habitat over a large landscape scale. At the same time, the rancher is continuing to apply beneficial grazing for GRSG on their property, with the support of the federal government.

Applying beneficial grazing is one of the conservation actions identified for GRSG by the Multi-Species Action Plan for GNP. Optimizing nesting and brood-rearing habitat is currently considered the most effective option for the recovery of the GRSG population in Canada.

Case Study: Manitoba's Species at Risk Partnership on Agricultural Lands

Manitoba has created mapping and extension materials on species at risk targeted to agricultural landowners, and used as part of the Environmental Farm Plan (EFP) workshop process. Targeted beneficial management practices (BMPs) for habitat creation/protection of species at risk are available to landowners who have a valid EFP Statement of Completion.

Case Study: Manitoba's Growing Forward 2 Ecological Goods and Services Program

This program provided financial assistance to local conservation districts to work with farmers to implement BMPs with a co-benefit for wildlife habitat on their farms and ranches, as well as the development of innovative decision tools and delivery mechanisms. Under the program, several

conservation districts implemented innovative program approaches, such as conservation auctions, conservation agreements, and land purchases of sensitive lands. The conservation district worked with Manitoba Habitat Heritage Corporation to develop conservation agreements.

Relevant websites, web links and files

- Action Plan for Multiple Species at Risk in Southwestern Saskatchewan: South of the Divide 2017: http://www.registrelep-sararegistry.gc.ca/default.asp?lang=En&n=F5AAFF2E-1
- Multi-species Action Plan for Grasslands National Park of Canada: http://www.registrelep-sararegistry.gc.ca/default.asp?lang=En&n=4F726743-1
- Manitoba Growing Forward 2 – Ecological Goods and Services Program: http://www.gov.mb.ca/agriculture/environment/ecological-goods-and-services/growing-assurance-egs.html

Obstacles and scientific and technical needs related to the measure taken

The indicators reported below in section III of "*farms with EFPs*" and "*Wildlife Habitat Capacity*" are used as measures of progress towards Canada's biodiversity Target 7. The connection between the effect of the program funding described above and landscape habitat change has not been modelled. The data to do so is not available. Other factors such as market forces can play a major role in agricultural habitat changes, for instance conversion of grasslands to annual crops.

Specific to the wildlife habitat capacity indicator, the indicator currently looks only at agricultural land and thus does not incorporate the influence of other, adjacent land-use types (for example, forestry) on wildlife using agricultural lands.

The Wildlife Habitat Capacity Agri-Environmental Indicator was developed using Agriculture and Agri-Food Canada Annual Cropland Inventory (ACI) Earth Observation data (see relevant websites, web links, and files for more information).

Limitations:

- Certain land cover types that have different habitat capacity could not be separated in this analysis and were therefore given a single habitat capacity:
    - Pastureland/grassland/hayland
    - Woodland/shrubland
    - Water/wetland
- Areas that had a high percentage classified as 'Too Wet to Seed' annually were removed from analysis and trend was calculated over remaining years.
- Extent of land included in this analysis was based on Soil Landscapes Polygons of Canada (see link below) with greater than 5% agricultural land. All land within these Polygons was used in the calculation.
- Newfoundland and Labrador was not considered in this analysis due to limited reporting years.

Relevant websites, web links and files

- Environmental sustainability of Canadian agriculture: Agri-environmental indicator report series – Report #4: http://publications.gc.ca/site/eng/9.812827/publication.html
- Canadian Environmental Sustainability Indicator, Wildlife habitat capacity on agricultural land: https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/wildlife-habitat-capacity-agricultural-land.html

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Describe a measure taken to contribute to the implementation of your country's national biodiversity strategy and action plan

Aquaculture science research

Canada's ongoing effort to build a science-based aquaculture management regime contributes to the following two of the five goals of the Canadian Biodiversity Strategy: "improve our understanding of ecosystems and increase our resource management capability"; and, "maintain or develop incentives and legislation that support the conservation of biodiversity and the sustainable use of biological resources." Canada has increased investment in aquaculture science research implemented under the Program for Aquaculture Regulatory Research (PARR) with a view to supporting the development of a robust regulatory framework that protects the environment and biodiversity on one hand and helps increase seafood production on the other. Scientific and regulatory tools have been developed or updated to address emerging issues that concern environmental impacts of aquaculture. In Canada, aquaculture is managed by two levels of government. In most of the country, provincial and territorial (Yukon) governments are the primary regulators for licensing and leasing (among many other authorities) under a variety of legislation. In British Columbia and Prince Edward Island, the federal government plays a more prominent role.

For the implementation measure, please indicate to which national or Aichi Biodiversity Target(s) it contributes

- Canada Target 8
- Aichi Targets 4 and 7

Assessment of the effectiveness of the implementation measure taken in achieving desired outcomes

☒ Measure taken has been effective
☐ Measure taken has been partially effective
☐ Measure taken has been ineffective
☐ Unknown

Please explain the selection and where possible indicate the tools or methodology used for the assessment of effectiveness above

The assessment was based on a subjective review of Canada's aquaculture research and monitoring efforts. As noted above, Canada has expanded its science research to promote a regulatory approach that can support sustainable aquaculture. The research projects respond to region-specific issues that arise from aquaculture activities or those that are found to be the most relevant for improving farm-level management (e.g. biodiversity and functional changes in benthic communities). Side by side, Canada implements programs to minimize impacts of aquaculture on biodiversity. For example, in the province of British Columbia, the largest aquaculture province, benthic monitoring of aquaculture sites is implemented in order to limit the location, area and intensity of aquaculture impacts on the seabed. The results of the monitoring are made available to the public through a web site. Taken together, these measures support the national biodiversity action plan and its effectiveness.

Relevant websites, web links and files

- Program for Aquaculture Regulatory Research (PARR) Projects: http://www.dfo-mpo.gc.ca/aquaculture/rp-pr/parr-prra/index-eng.html
- Results of industry benthic monitoring of British Columbia marine finfish aquaculture sites: https://open.canada.ca/data/en/dataset/7e76fdc8-c36a-491a-9afb-4f9280c929e8

Other relevant information

An example of building an aquaculture management regime on science advice is the use of the series of aquaculture environmental risk assessments to respond to an independent Commission of inquiry into the decline of sockeye salmon in the Fraser River in the province of British Columbia. Sockeye is the second most abundant species of salmon in British Columbia and has long supported Indigenous, commercial and recreational fisheries. It is also considered an iconic species with cultural and social significance to both Indigenous and non-Indigenous populations. The supposition that aquaculture activities in the area are a potential source of risk to the abundance and diversity of the sockeye population led the Government of Canada to initiate an independent Commission in 2009. In 2012, the Commission recommended suspending new aquaculture activities in the southwest of the Province until at least 2020 pending research on aspects of health, disease and parasites, and environment proved otherwise. Canada responded to the recommendation by limiting existing activities and suspending new activities in the area. Meanwhile, Canada has begun a series of risk assessments to determine the risk posed to Fraser River Sockeye Salmon from the transfer of pathogens from farmed Atlantic salmon in the Discovery Islands. The first risk assessment of infectious hematopoietic necrosis virus has concluded that the risk is minimal. The finding will be integrated into fish health management plan in the region. Additional research on the other pathogens is underway.

Relevant websites, web links and files

- Science Advisory Report 2017/048: http://www.dfo-mpo.gc.ca/csas-sccs/Publications/SAR-AS/2017/2017_048-eng.html

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Describe a measure taken to contribute to the implementation of your country's national biodiversity strategy and action plan

Sustainable Fisheries Framework

Canada's Sustainable Fisheries Framework (SFF) provides the national policy basis to manage fisheries sustainably. The individual SFF policies are designed to mitigate the risks that fisheries may pose to target species, bycatch, benthic habitat and other ecosystem components. The policies are applied to fisheries using the best available science information through the Integrated Fisheries Management Planning process. The SFF sets the foundation for an ecosystem approach to fisheries management in Canada. Canada tracks and reports publicly on the implementation of the SFF policies using an annual survey: *Sustainability Survey for Fisheries*. The survey results identify progress and areas for improvement.

For the implementation measure, please indicate to which national or Aichi Biodiversity Target(s) it contributes

- Canada Target 9
- Aichi Targets 4, 5, 6

Assessment of the effectiveness of the implementation measure taken in achieving desired outcomes

☒ Measure taken has been effective
☐ Measure taken has been partially effective
☐ Measure taken has been ineffective
☐ Unknown

Please explain the selection and where possible indicate the tools or methodology used for the assessment of effectiveness above

The SFF is Canada's national policy framework for managing fisheries to support the conservation and sustainable use of marine resources. Canada assesses the effectiveness of the implementation of the SFF policies using the annual *Sustainability Survey for Fisheries*, which tracks progress to apply the policies to Canada's major fish stocks. The survey also tracks the status of the major stocks and the survey results provide evidence of Canada's progress to achieve Aichi Target 6.

Relevant websites, web links and files

- Sustainability Survey for Fisheries: http://www.dfo-mpo.gc.ca/reports-rapports/regs/sff-cpd/survey-sondage/index-en.html
- Sustainable Fisheries Framework of Policies: http://www.dfo-mpo.gc.ca/reports-rapports/regs/sff-cpd/overview-cadre-eng.htm
- CESD Audit Work Plan: http://www.dfo-mpo.gc.ca/ae-ve/audits-verifications/16-17/work-plan-travail-eng.html
- Canadian Environmental Sustainability Indicator, Sustainable fish harvest: https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/sustainable-fish-harvest.html

- Canadian Environmental Sustainability Indicator, Status of major fish stocks: https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/status-major-fish-stocks.html

Other relevant information

To illustrate, under Canada's Precautionary Approach policy, when a fish stock's abundance has declined to the critical zone (a specified low level) a plan must be put in place to restore the stock to healthier levels. The *Sustainability Survey for Fisheries* identifies which major stocks are in the critical zone and whether the stock has a rebuilding plan or not. Based on the results of the survey, in 2017 Canada developed and made public a plan to complete rebuilding plans for 19 priority fish stocks over the next four years. Under this plan, three of those 19 rebuilding plans are to be completed before the end of fiscal 2017-18. Rebuilding fish stocks will contribute to increasing and maintaining the biodiversity of Canada's marine fish resources.

Relevant websites, web links and files

- CESD Audit Work Plan: http://www.dfo-mpo.gc.ca/ae-ve/audits-verifications/16-17/work-plan-travail-eng.html

Obstacles and scientific and technical needs related to the measure taken

One challenge to implementing the SFF policies is that the variety of fish stocks, fisheries and fishery controls in Canada means that the SFF policies often must be adapted to a wide range of situations, resulting in the need for additional operational guidance and technical advice to apply the policies.

In addition, as scientific advice is required to apply the SFF policies to individual fish stocks and fisheries, scientific capacity is a factor that influences the pace at which the SFF policies are implemented. To manage this, priorities for science advice related to the SFF policies are established on an annual basis.

Relevant websites, web links and files

- Sustainability Survey for Fisheries: http://www.dfo-mpo.gc.ca/reports-rapports/regs/sff-cpd/survey-sondage/index-en.html

Describe a measure taken to contribute to the implementation of your country's national biodiversity strategy and action plan

Implementation of the Canada-U.S. Great Lakes Water Quality Agreement (GLWQA)

Canada's efforts in the Great Lakes are guided by its commitments under the Canada-U.S. *Great Lakes Water Quality Agreement (GLWQA)*, an important framework for binational consultation and cooperative action to restore, protect and conserve water quality and ecosystem health in the basin. Through the GLWQA, Canada and the U.S. have agreed to numerous commitments related to key environmental challenges of shared concern in the basin, such as Areas of Concern (AOCs), nutrients, chemicals of mutual concern (CMCs) as well as the conservation and restoration of native habitat and species, amongst others. In 2016, Canada and the U.S. established binational phosphorus load reduction targets for Lake Erie and committed to developing, by 2018, domestic action plans to achieve these targets. Canada and the U.S. are also working collaboratively to tackle threats posed by other pollutants, including through the development of binational strategies to reduce CMCs and making progress on the management of contaminated sediment in AOCs.

To deliver on its binational commitments, Canada invests tens of millions of dollars in regional and national programs that support Great Lakes restoration and protection. The Great Lakes Protection Initiative, which received an additional investment of $44.84 million through Budget 2017, is the primary federal initiative that directly responds to Canada's commitments under the GLWQA. The Initiative focuses on eight priorities for action, several of which contribute to Canada's progress on Target 10 in the Great Lakes:

- Working with others to protect the Great Lakes
- Restoring water quality and ecosystem health in Areas of Concern
- Preventing toxic and nuisance algae
- Assessing and enhancing the resilience of Great Lakes coastal wetlands
- Evaluating and identifying at risk nearshore waters
- Reducing releases of harmful chemicals
- Engaging Indigenous peoples in addressing Great Lakes issues
- Increasing public engagement through citizen science

Given the division of responsibilities over water resources in Canada, the Governments of Canada and Ontario work in close partnership to cooperate and coordinate efforts to restore and protect the Great Lakes and meet obligations under the GLWQA. This is achieved through the Canada-Ontario Agreement on Great Lakes Water Quality and Ecosystem Health (COA), 2014. The COA outlines actions Canada and Ontario are taking to implement the GLWQA, and serves as a framework through which progress is made toward other shared goals in Canada's portion of the Great Lakes drainage basin. There have been many bilateral accomplishments to date. Most recently, Canada and Ontario developed, in collaboration with other partners, a joint Domestic Action Plan, the Canada-Ontario Lake Erie Action Plan, for achieving phosphorus load reductions to Lake Erie from Canadian sources. Moving forward, Canada and Ontario will be working with its partners to implement the measures detailed in the Plan. Canada and Ontario are also working collaboratively on a baseline assessment of the nearshore waters and shoreline ecosystems of the Great Lakes in order to better understand the state of these unique habitats and direct future conservation efforts.

For the implementation measure, please indicate to which national or Aichi Biodiversity Target(s) it contributes

- Canada Target 10
- Canada Target 11
- Aichi Target 8

Assessment of the effectiveness of the implementation measure taken in achieving desired outcomes

☐ Measure taken has been effective
☒ Measure taken has been partially effective
☐ Measure taken has been ineffective
☐ Unknown

Please explain the selection and where possible indicate the tools or methodology used for the assessment of effectiveness above

A comprehensive assessment of the overall health of the Great Lakes watershed is given in the *State of the Great Lakes 2017* in the Great Lakes Water Quality Agreement. Overall, the Great Lakes are assessed as "Fair" and "Unchanging". While progress to restore and protect the Great Lakes has been made, including the reduction of toxic chemicals, challenges remain with issues such as invasive species and nutrients.

Through the GLWQA, Canada and the U.S., along with their many partners in the Great Lakes basin, have achieved binational progress on commitments related to each priority issue identified in the Agreement, including those pertaining to Target 10 (e.g. Areas of Concern; Chemicals of Mutual Concern; Nutrients; and, Lakewide Management). Some key achievements include:

- Completing many remedial actions to clean up Areas of Concern (AOCs) on both sides of the border. Under the 1987 GLWQA, 43 AOCs were identified by Canada and the U.S. (26 in the U.S.; 12 in Canada; and 5 shared binationally). In Canada, three AOCs have been delisted and two AOCs have been re-designated as Areas in Recovery. Work to restore water quality and ecosystem health at remaining Canadian AOCs is underway. By 2019, Canada expects to complete required remedial actions in four additional AOCs.
- Designating eight chemicals of mutual concern. The focus has now shifted to developing binational strategies to target each of these chemicals.
- Adopting binational phosphorus load reduction targets to combat algal blooms in Lake Erie and developing domestic action plans to achieve these targets.
- Issuing a binational Lakewide Action and Management Plans for each lake once every five years with lake-specific strategies and initiatives.

The $45 million investment in 2017 through the Great Lakes Protection Initiative described above will help Canada realize further accomplishments in coming years, building on these past achievements.

COA includes a number of complementary initiatives that contribute to both bilateral priority goals and binational commitments under the GLWQA, such as:

- Reducing harmful and nuisance algal blooms in the Great Lakes. Initiatives include federal and provincial investments in nutrient related research and monitoring; green infrastructure, wastewater technologies and facilities upgrades; and, improvements in urban and rural land use and land management practices. On February 22, 2018, Canada and Ontario released a joint Domestic Action Plan to meet phosphorus load reduction targets that apply to the Canadian side of Lake Erie.
- Reduction of harmful pollutants in the Great Lakes environment. Commitments include: completing a status report of chemicals identified as Tier I and Tier II substances; establishing a Canada-Ontario Chemicals Management Committee; establishing a process to identify Chemicals of Concern in the Great Lakes and to cooperate on specific research, monitoring, surveillance, and risk management actions for these Chemicals of Concern; and taking actions to reduce risks and impacts from environmental emergencies and spills, as well as stormwater and wastewater contaminant loadings.
- Restoring water quality and ecosystem health in AOCs.
- Establishing frameworks for lake-wide management, including existing and new initiatives in priority geographies in each Great Lake, to help achieve ecosystem objectives and address lakewide and nearshore issues.
- Development of methodology for classification of Great Lakes shoreline ecosystems to map an inventory of these habitats along a 2 km buffer for all Canadian Great Lakes.

The report, "*Status of Tier 1 and Tier 2 chemicals in the Great Lakes basin under COA"* (see relevant websites, web links, and files for more information including definitions) provides an assessment of progress with respect to the reduction of these harmful pollutants in the Great Lakes environment as follows:

- Concentration levels of most Tier 1 chemicals have gone down over time across the Great Lakes, in water, sediment, fish and Herring Gull eggs.
- There is limited information available on the concentrations of most Tier 2 chemicals in water, sediment or fish. Monitoring efforts completed to date show that concentration levels for select PAHs are above the water and sediment guidelines at locations associated with industrial emissions and, in some locations, concentration levels of cadmium are above water and sediment guidelines.

Significant progress has been made through the implementation of the COA, particularly with respect to meeting the goals identified under the Nutrients, Harmful Pollutants, Areas of Concern and Lakewide Management Annexes.

Relevant websites, web links and files

- 2012 Great Lakes Water Quality Agreement (GLWQA): https://www.canada.ca/en/environment-climate-change/services/great-lakes-protection/2012-water-quality-agreement/appendix.html
- Lake Erie Phosphorus Load Reduction Targets: https://binational.net/2016/02/22/finalptargets-ciblesfinalesdep/
- Great Lakes Protection Initiative: https://www.canada.ca/en/environment-climate-change/services/great-lakes-protection.html

- State of the Great Lakes 2017 Highlights Report: https://binational.net/wp-content/uploads/2017/06/SOGL_17-EN.pdf
- Status of Tier 1 and Tier 2 chemicals in the Great Lakes basin under the Canada-Ontario Agreement: https://www.ontario.ca/page/status-tier-1-and-tier-2-chemicals-great-lakes-basin-under-canada-ontario-agreement
- Canada-Ontario Agreement (COA) on Great Lakes Water Quality and Ecosystem Health: https://www.canada.ca/en/environment-climate-change/services/great-lakes-protection/canada-ontario-agreement-water-quality-ecosystem.html

Other relevant information

- Additional resources were provided in Budget 2017 to support efforts under the Great Lakes Protection Initiative.
- Within the set of Canadian Environmental Sustainability Indicators, the "Phosphorus levels in the offshore waters of the Great Lakes" indicator shows deteriorating trends in some regions. While the "Restoring the Great Lakes Areas of Concern" indicator shows some progress in the restoration of key sites under intense environmental pressure.

Relevant websites, web links and files

- Great Lakes Protection Initiative 2017 Budget News Release: https://www.canada.ca/en/environment-climate-change/news/2017/12/the_government_ofcanadainvestsingreatlakesprotectioninitiative.html
- Phosphorus levels in the offshore waters of the Great Lakes: https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/phosphorus-levels-off-shore-great-lakes.html
- Restoring the Great Lakes Areas of Concern: https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/restoring-great-lakes-areas-concern.html

Obstacles and scientific and technical needs related to the measure taken

The GLWQA and COA have been important tools for binational and bilateral cooperation and collaboration, and have led to significant progress on shared environmental goals in the Great Lakes basin. Maintaining strong relationships with the U.S., Ontario and other partners in the basin is important for achieving further improvements to water quality and ecosystem health in the basin.

While Canada and Ontario have been able to fund and support significant programing and science to manage environmental stress in the Great Lakes, further support is required to fully address GLWQA and COA commitments. Moving forward, it will be important to leverage existing activities in the area – including those of other partners including industry, the agricultural sector, Indigenous peoples, municipalities and others – and aim for co-benefits for the economy, human health and the environment.

Environmental monitoring is expensive and coverage of such a vast area as the Great Lakes watershed is challenging; however, collaboration among jurisdictions has made it possible to monitor a considerable portion of the watershed.

Many issues such as excessive phosphorus loading require long term commitment to meet goals and objectives. Further, progress on reducing phosphorus loadings depends, in part, on factors that are out of government and their partners' control, including typical and extreme weather events.

Describe a measure taken to contribute to the implementation of your country's national biodiversity strategy and action plan

Strengthening national collaboration and governance on Invasive Alien Species prevention and management

In Canada, it has been clearly identified that to be effective, the approach for preventing and mitigating the effects of IAS has to move beyond sectoral and jurisdictional approaches, and therefore requires an ongoing national, over-arching, inter-jurisdictional coordination mechanism for IAS issues. In February 2015, the federal, provincial, and territorial Conservation, Wildlife and Biodiversity Ministers renewed their commitment to work towards the strategic goals of An *Invasive Alien Species Strategy for Canada* of 2004 (the Strategy), and established an ad hoc Federal-Provincial-Territorial Invasive Alien Species Task Force (FPT IAS) to identify recommendations to improve IAS prevention and management in Canada. The Task Force developed three recommendations to advance FPT work on invasive alien species, all focused on adding value to existing work:

- Recommendation 1: Improve National Leadership and Coordination of IAS Actions in Canada: Formalize the Federal-Provincial-Territorial Invasive Alien Species Task Force
    - The focus of this work is to strengthen policy frameworks to address IAS, coordinate national studies and analysis and encourage collaboration and partnerships.
- Recommendation 2: Improve Emergency Response to IAS Incursions: Develop a National Framework for Early Detection and Rapid Response (EDRR) Initiatives
    - This recommendation is to focus on providing guidance on how to respond to new invasive species, encouraging the development of EDRR Plans (e.g. for high risk species/taxonomic groups) and sharing EDRR experiences and build on lessons learned.
- Recommendation 3: Enable Actions by Canadians: Join Forces to Combat IAS
    - This would focus on building strategic partnerships, communicating and educating, building capacity, sharing information and data and strengthening funding for the fight against IAS.

As part of the process of developing the recommendations, a joint national planning session was held in 2017 between the IAS Task Force and the Canadian Council on Invasive Species (CCIS). The CCIS brings together provincial and territorial councils, governments, other NGOS, businesses/industry and indigenous groups, to collaborate on National outreach campaigns and information across jurisdictions to prevent the spread of invasive species.

The Task Force recommendations were approved by Ministers in 2017, and a permanent national committee was established to complement and coordinate efforts with existing working groups (such as the National Aquatic Invasive Species Committee, focused on aquatic invasive species and the Forest Pests Working Group) and enable ongoing joint work to advance the Task Force recommendations.

The National Committee on IAS provides a national coordination mechanism to support collaborative efforts to fight against invasive species in Canada and enables collaboration between various departments of the Government of Canada and provincial and territorial governments.

For the implementation measure, please indicate to which national or Aichi Biodiversity Target(s) it contributes

- Canada Target 11
- Aichi Target 9

Assessment of the effectiveness of the implementation measure taken in achieving desired outcomes

☐ Measure taken has been effective
☐ Measure taken has been partially effective
☐ Measure taken has been ineffective
☒ Unknown

Please explain the selection and where possible indicate the tools or methodology used for the assessment of effectiveness above

The establishment of a permanent federal-provincial-territorial committee on IAS (the National Committee on IAS) addresses a key recommendation of the ad hoc FPT Task force of improving national leadership and coordination of IAS actions in Canada. The Committee is in the process as of 2018 of establishing their Work Plan of future actions to be taken, and therefore it is still early to measure its effectiveness.

Relevant websites, web links and files

- Invasive Alien Species: http://biodivcanada.ca/default.asp?lang=En&n=81BC7F85-1

Obstacles and scientific and technical needs related to the measure taken

There are challenges that exist for provinces and territories in identifying high risk IAS (both aquatic and terrestrial) and pathways for their regulatory consideration. Significant resources are required to conduct risk assessment, and thus greater collaboration amongst jurisdictions would be useful to avoid duplication of efforts and to create greater efficiencies. Also, priorities in IAS issues vary considerably by region in Canada due to the heterogeneity of the climate, ecosystems and potential pathways of incursions of IAS throughout the country. This creates challenges in the national coordination of IAS issues highlighting the importance of a strong collaboration across jurisdictions.

More work also remains to be done in the improvement of IAS prevention and management to allow for early detection, enhanced protection of international borders from IAS introduction, as well as spread within Canada. Further, assessment and management of pathways of concern such as online trade, pet trade, live food, etc., require additional work.

Describe a measure taken to contribute to the implementation of your country's national biodiversity strategy and action plan

Indigenous Guardians Programs

Indigenous peoples are connected to their traditional territories, which include lands, waters and ice. They use, govern, and conserve traditional territories in accordance with Indigenous knowledge systems, laws, and values. One way for Indigenous communities to protect and manage land and marine resources is through Indigenous Guardians programs, which have existed in Canada for several decades. Recognizing the intimate connection between Indigenous peoples and the environment as well as the positive benefits Indigenous Guardians programs bring to Indigenous communities, the federal government recently announced funding to support Indigenous Guardians programs.

For the implementation measure, please indicate to which national or Aichi Biodiversity Target(s) it contributes

- Canada Targets 12 and 15
- Aichi Target 18

Assessment of the effectiveness of the implementation measure taken in achieving desired outcomes

☒ Measure taken has been effective
☐ Measure taken has been partially effective
☐ Measure taken has been ineffective
☐ Unknown

Please explain the selection and where possible indicate the tools or methodology used for the assessment of effectiveness above

To date, Indigenous communities in Canada have launched Guardians programs in various regions of the country, including land and marine protected areas. An analysis of two existing Indigenous Guardians programs in Canada's Northwest Territories has found that they deliver social, economic, cultural and environmental value and, with the support from a national network, long-term benefits could be secured, notably in terms of increased consistency and additional, specialized training (see relevant websites, web links, and files for more information).

Relevant websites, web links and files

- Indigenous Leadership Initiative – Indigenous Guardians Program: https://www.ilinationhood.ca/our-work/guardians/
- Coastal Guardian Watchmen Support: http://coastalfirstnations.ca/our-environment/programs/coastal-guardian-watchmen-support/
- Parks Canada – Guardian and Watchmen Programs: https://www.pc.gc.ca/en/culture/autochtones-indigenous/gardiens-guardians
- Analysis of the Current and Future Value of Indigenous Guardian Work in Canada's Northwest Territories: http://www.ilinationhood.ca/wp-content/uploads/2016/11/value-in-indigenous-guardian-work-nwt.pdf

Other relevant information

Building on the early success of initiatives that have mostly worked in isolation, the Government of Canada announced in Budget 2017 an investment of $25 million over five years to support a pilot initiative to establish a national network of existing Indigenous Guardians programs. The objective of this initiative is to give Indigenous peoples greater responsibility and resources to manage their traditional lands and waterways. It will facilitate partnership with Indigenous communities, and provide additional funding to existing Indigenous programs to support their activities related to monitoring ecological health, maintaining cultural sites, and protecting sensitive areas and species.

In addition, the Government of Canada announced in July 2018 an investment of up to $900,000 for the implementation of a pilot Guardian program in Arctic Bay, Nunavut. The funding will support the Qikiqtani Inuit Association to explore how Inuit can be engaged in the management of the Tallurutiup Imanga National Marine Conservation Area, the newest and largest marine protected area in Canada.

Relevant websites, web links and files

- Funding for pilot Guardian program in Arctic Bay: https://www.canada.ca/en/parks-canada/news/2018/07/parks-canada-announces-funding-to-qikiqtani-inuit-association-for-pilot-guardian-program-in-arctic-bay.html
- Linked attachment: Canada Target 12 Detailed Report: http://twk.pm/h9wsv8x8m8

Obstacles and scientific and technical needs related to the measure taken

It is expected that the federal funding announced in Budget 2017 will help develop networks to share knowledge and experience between First Nations, Inuit and Metis Guardians programs, support expansion of existing programs, and prepare communities to launch new Guardians programs. In response to the capacity development needs, the Canadian affiliate of The Nature Conservancy (TNC Canada) recently facilitated the development of an Indigenous Guardians Toolkit, which consists of an online, central repository of resources for sharing and connecting around knowledge and experiences related to Indigenous Guardians programs. This tool will complement programs being delivered as a result of Canada's Budget 2017 funding.

Relevant websites, web links and files

- Indigenous Guardians Toolkit Brochure: https://www.indigenousguardianstoolkit.ca/sites/default/files/Community%20Resource_TNC%20Canada_Indigenous%20Guardians%20Toolkit%20Brochure.pdf
- Indigenous Guardians Toolkit: https://www.indigenousguardianstoolkit.ca/

Describe a measure taken to contribute to the implementation of your country's national biodiversity strategy and action plan

Ontario Biodiversity Atlas: Identification of High Value Biodiversity Areas

The Government of Canada has produced a regional Biodiversity Atlas in the province of Ontario to support conservation policy and decision making. The Atlas is intended to help the government, in collaboration with conservation partners, to better integrate legislative, stewardship and incentive tools to address cross-cutting issues, and more effectively and efficiently implement an ecosystem approach by supporting management of multiple biodiversity elements at site, ecosystem or regional scales.

The Atlas maps species and habitats of federal concern including identifying areas that have multiple and overlapping biodiversity values where targeted conservation actions may have the greatest impact. In particular High Value Biodiversity Areas (HVBAs) are identified across southern and central Ontario. These places contain the highest quality habitat (forest, grassland or wetland) important for species at risk and migratory birds. The Atlas is built on data from an extensive landscape assessment that analyzed species at risk, migratory birds, and habitats at various resolutions. At the finest resolution (5 hectare units in central Ontario; 2 hectare units in southern Ontario) biodiversity is mapped by forest, grassland and wetland quality and quantity, and combined with species at risk and migratory bird data to progressively identify areas important for various species at risk and bird guilds and ultimately areas of highest biodiversity value. Habitat condition scores are based upon existing *How Much Habitat is Enough?* (Environment and Climate Change Canada (ECCC), 3rd edition) guidelines and in central Ontario, where the landscape is less fragmented, habitat is also assessed using the draft guidance *How Much Disturbance is too Much?* (ECCC, unpublished), which emphasizes the importance of diversity and connectivity within habitat mosaics. Individual scores were summed and various combinations (e.g. top 25% of forest scores + top 25% of species at risk scores) were calculated to identify areas with multiple and overlapping conservation value.

The Biodiversity Atlas is a tool to help the Government of Canada to better understand the distribution of species and habitats within its biodiversity portfolio, and has been shared with partners to help facilitate the conservation of important natural places. It is hoped that by sharing the Atlas, and in particular the HVBAs, the federal government can support partners in the identification of key wildlife habitats and places for protection, restoration and stewardship activities while at the same time advancing progress to achieve national biodiversity targets.

For the implementation measure, please indicate to which national or Aichi Biodiversity Target(s) it contributes

- Canada Targets 1, 2, 3, 4, 14, and 17
- Aichi Targets 11, 12, 19

Assessment of the effectiveness of the implementation measure taken in achieving desired outcomes

☒ Measure taken has been effective
☐ Measure taken has been partially effective
☐ Measure taken has been ineffective
☐ Unknown

Please explain the selection and where possible indicate the tools or methodology used for the assessment of effectiveness above

This effectiveness is measured by the demand for, and distribution of, HVBAs and accompanying information. The Atlas is a new product with limited distribution and promotion so far but initial uptake and interest has been very good. At various workshops and forums, officials have presented the science

behind the identification of HVBAs and emphasized their usefulness for helping to set priorities when used in combination with national policies, threat analyses, and resource and program assessments. As a result, the HVBAs have become a desirable tool that conservation partners are requesting in order to integrate them into their own conservation and stewardship efforts, and the data has been distributed to a wide range of partners. These partners include provincial Conservation Authorities, land trusts, nature associations and municipalities across southern and central Ontario.

The HVBAs reflect a philosophy of targeting existing areas of higher biodiversity for restoration, defragmentation and linking. They act as a tool for Canada to advance its legislative responsibilities as they relate to protecting and conserving existing wildlife and habitat – particularly in southern Ontario, where land ownership is largely private. The intention is that by sharing the science base for biodiversity, partners will use the HVBAs to affect their own conservation priorities and to date, HVBAs have been used in a number of planning and reporting exercises. These are illustrated in the list of relevant websites, web links, and files. In this regard, the Atlas and identification of HVBAs have been effective in achieving desired outcomes.

Relevant websites, web links and files

- Environment Canada. 2013. *How Much Habitat is Enough?* Third Edition. Environment Canada, Toronto, Ontario: https://www.ec.gc.ca/nature/default.asp?lang=En&n=E33B007C-1
- Environment Canada. 2014. *Terrestrial Biodiversity of Federal Interest in the Mixedwood Plains Ecozone of Ontario*. Environment Canada, Toronto, Ontario: https://www.ec.gc.ca/nature/default.asp?lang=En&n=3B824EDF-1

Other relevant information

In southern Canada, and in particular in southern Ontario, where land ownership is largely private, assessing areas with high biodiversity value that may be potential sites for securement or conservation actions improves the government's reporting and advances opportunities to conserve important habitat, improve connectivity, and protect underrepresented ecological regions. The HVBA mapping within the Biodiversity Atlas has been instrumental in advancing these objectives. Key accomplishments include:

1. **Integration of High Value Biodiversity Areas as a landscape indicator in the Georgian Bay Biosphere Reserve's *2018 State of the Bay Report***

In 2016 officials gave a presentation at the Georgian Bay Biosphere Reserve on the potential utility of HVBAs towards science-based landscape planning across a region that remains ecologically intact compared to southern Ontario. As a result of this presentation, the Georgian Bay Biosphere Reserve developed a new indicator in their *2018 State of the Bay Report* for "Landscape Biodiversity," using the HVBAs as the science base to measure its state.

2. **Natural Heritage Planning Workshops**

In 2017 officials participated in four workshops across southern and central Ontario with organizations responsible for identifying Natural Heritage Systems and Features. The Atlas and in particular the HVBAs were showcased as a tool that organizations (e.g. provincial Conservation Authorities, municipalities, and counties) could use to integrate into their own natural heritage mapping. As a result, biodiversity considerations informed by the Atlas are being integrated into municipal planning and conservation activities.

3. **High Value Biodiversity Areas as a Mapping Resource in the Algonquin to Adirondacks Conservation Action Plan**

In 2017 officials collaborated with the Algonquin to Adirondacks (A2A) Collaborative to enhance their Regional Connectivity Mapping. Through stakeholder meetings, A2A identified a need for mapping resources to guide conservation planning decisions, and used the Biodiversity Atlas to help fill these gaps. Specifically, the HVBAs provided a significant contribution to the A2A Conservation Action Plan project as they enhanced connectivity and corridor analyses that A2A had initiated for the region.

4. Fully Accounting for Canada's Conservation Lands: Phase I and Phase II

In 2016 and 2017 officials worked with the Ontario Centre for Climate Impacts and Adaptation Resources on a two-Phase project to test the effectiveness of a Screening Tool for assessing the protection status of private conservation lands. This included testing the Screening Tool methodology on a sample of lands to assess whether they would qualify as 'other effective conservation measures' under Canada Target 1. The HVBAs were used to assist in the identification of sample lands, and subsequent analyses have led to the HVBAs being recognized as an analysis tool to identify gaps in meeting the 17% target. These reports have helped articulate the potential contribution of non-government lands to biodiversity conservation and progress toward Canada Target 1.

Relevant websites, web links and files

- Gray, P.A., T.J. Beechey, C.J. Lemieux, A.G. Douglas, G. Bryan, and J. Sherwood. 2017. *Fully Accounting For Canada's Conservation Lands: Assessing the Protection and Conservation Value of Lands Managed by Conservation Authorities and Partners in Ontario*. Ontario Centre for Climate Impacts and Adaptation Resources (OCCIAR), Sudbury, Ontario, Canada. http://www.climateontario.ca/doc/reports/FullyAccountingForCanadasConservationLands_FINAL.pdf
- Georgian Bay Biosphere Reserve (2018). *State of the Bay: 2018 Ecosystems Health Report for Eastern and Northern Georgian Bay*: https://www.stateofthebay.ca/wp-content/uploads/2018/07/GBBR_State-of-the-Bay_2018_Magazine.pdf

Obstacles and scientific and technical needs related to the measure taken

One significant obstacle has been limited capacity to distribute the Atlas and HVBAs. Until March 2018, the mechanism for distributing the data was through personal correspondence. In March 2018 the data was made available on the Government of Canada Open Data Portal, which will significantly enhance the availability and accessibility of the data to partners.

The HVBAs provide a 'snapshot' of biodiversity and are current as of 2016; opportunities for refinement and updating of the data are limited both by availability and by scale of relevant biological data. In order to remain useful data will need to be continually updated.

Relevant websites, web links and files

- High Value Habitats and High Value Biodiversity Areas: https://open.canada.ca/data/en/dataset/371b6d30-e433-477d-a1cb-5d5fd01c731d

Describe a measure taken to contribute to the implementation of your country's national biodiversity strategy and action plan

Municipal Natural Assets Initiative

The Municipal Natural Assets Initiative (MNAI) provides scientific, economic and municipal expertise to support and guide local governments in identifying, valuing and accounting for natural assets in their financial planning and asset management programs, and in developing leading-edge, sustainable and climate resilient infrastructure.

Through this initiative, "natural assets" are defined as natural resources or ecosystems that contribute to the provision of one or more municipal services required for the health, well-being, and long-term sustainability of a community and its residents. In other words, natural assets, such as aquifers, forests, streams, and foreshores can provide municipalities with vital services equivalent to those provided by engineered assets.

To date, the MNAI has guided five diverse municipalities from across Canada through a first cohort of pilot projects. Through these projects, each municipality has identified a natural asset of interest, measured its performance related to stormwater management or flood mitigation services, and has valued those services in terms of cost of replacement compared to engineered alternatives. The results are showing that each natural asset assessed provides equivalent services to engineered alternatives and is resilient in the face of climate change or intensified development; and will create a basis for their effective management through core municipal decision-making systems.

Based on these initial efforts, MNAI is scaling up these innovative efforts, including: a second national cohort of five additional projects; the development and application of guidance and training materials for rural and lower-capacity communities in a single British Columbia watershed and then in Ontario's Greenbelt; expanding its methodology and tools to include coastal services; and, conducting research to create strong enabling conditions for municipal natural asset management.

MNAI has set for itself the goal of making municipal natural asset management a mainstream practice across Canada.

The increased awareness of the ecosystem services provided by natural assets for the economic, social, and environmental well-being of our communities and the inclusion of natural assets into municipal planning and decision-making will increase our understanding and protection of natural ecosystems. Protecting and enhancing biodiversity will be a clear co-benefit.

For the implementation measure, please indicate to which national or Aichi Biodiversity Target(s) it contributes

- Canada Targets 1, 3, 4, 13, 17, 18
- Aichi Targets 1, 2, 11, 14, 15

Assessment of the effectiveness of the implementation measure taken in achieving desired outcomes

☒ Measure taken has been effective
☐ Measure taken has been partially effective
☐ Measure taken has been ineffective
☐ Unknown

Please explain the selection and where possible indicate the tools or methodology used for the assessment of effectiveness above

Each MNAI pilot community implemented the methodology developed by the MNAI team to identify, measure, and value a natural asset for its stormwater management services. The effectiveness of these projects is measured by the indicated desire of each municipality to use the results of their project to continue to assess other natural assets in their region and to incorporate natural asset management in to their financial and asset management planning processes.

Relevant websites, web links and files

- Municipal Natural Assets Initiative: https://mnai.ca/
- Town of Gibsons: http://gibsons.ca/sustainability/natural-assets/

Other relevant information

Technical reports from each of the pilot projects are near completion and will be posted on the mnai.ca website for public availability.

Furthermore, MNAI has conducted numerous research and awareness projects to help create strong enabling conditions for municipal natural asset management across Canada.

Relevant websites, web links and files

- Municipal Natural Assets Initiative: https://mnai.ca/
- Town of Gibsons: http://gibsons.ca/sustainability/natural-assets/

Obstacles and scientific and technical needs related to the measure taken

One of the main challenges with the MNAI first cohort of pilot projects is that many municipalities do not have the core asset management systems on which to build municipal natural asset management, nor do they have the specific tools and knowledge to do so. For example, they often do not have resources or access to the modeling needed to consider scenarios for municipal natural asset management.

To address these challenges, the MNAI team is developing new materials for training that will include core asset management principles as well as municipal natural asset management tools and guidance. These will be integrated into MNAI's new group training and technical support program for lower-capacity municipalities. As part of this project, storm water scenario modeling will be included as a core service to MNAI communities beginning with the 7 British Columbia and 7 Ontario communities.

Relevant websites, web links and files

- Municipal Natural Assets Initiative: https://mnai.ca/
- Town of Gibsons: http://gibsons.ca/sustainability/natural-assets/

Describe a measure taken to contribute to the implementation of your country's national biodiversity strategy and action plan

The Ecosystem Services Toolkit

The *Canadian Biodiversity Strategy*, *Biodiversity Outcomes Framework*, and *2020 Biodiversity Goals and Targets for Canada* together comprise Canada's NBSAP. These documents recognize the need to identify the diverse values of biodiversity and ecosystem services. Senior managers in federal, provincial, and territorial governments recognized the need for detailed practical guidance that would enable them to assess ecosystem services and to use that information in support of decision making.

Most guidance documents on ecosystem services available in 2010 tended to focus primarily on overviews of economic methods, and none provided integrated, detailed, interdisciplinary guidance spanning the biophysical science, social science, economic, and policy aspects of ecosystem services analysis and assessment to support decision making.

To address this priority, the Federal, Provincial, and Territorial governments of Canada collaboratively developed a comprehensive technical guide entitled the *Ecosystem Services Toolkit: Completing and Using Ecosystem Service Assessment for Decision-Making: An Interdisciplinary Toolkit for Managers and Analysts*. The Ecosystem Services Toolkit was published in 2017 and is freely available as a download in English or French, as a dynamic PDF file.

The Toolkit is a practical, step-by-step guide with numerous resources for further understanding and direction. The approach is fully interdisciplinary. It is meant to assist in addressing the need to build capacity to use ecosystem service assessment and to help reflect ecosystem service considerations in environmental management and decision-making. Roles for different kinds of knowledge, including Indigenous knowledge, are interwoven because ecosystem services are a result of the interactions between ecosystems and human societies. Ecosystem service assessment and many of its component analyses will, therefore, be accomplished through interdisciplinary collaboration among biophysical scientists, social scientists, and economists in every step.

- ***Chapter 1*** sets the foundations: the reasons for using an ecosystem services lens in decision making, types of ecosystem services, a conceptual framework for assessment, and advice on how to determine whether or not an ecosystem service assessment is advisable or warranted for a given situation.
- ***Chapter 2*** explains the six steps of ecosystem service assessment, from clearly identifying the reasons and context for the work to communicating the final results. Links to key tools and resources in the *Tool Tabs* are integrated to help complete each step.
- ***Chapter 3*** offers advice on how to address ecosystem services considerations in a variety of different policy contexts such as spatial planning, environmental assessment, and wildlife management, among others. For each policy or decision context the chapter advises on the relevance of ecosystem services, and entry points for incorporating ecosystem services analysis or considerations in typical processes. Canadian examples are featured for most of the contexts.
- **Ten "*Tool Tabs*"** provide tools and resources for completing an ES assessment, including:
    - Practical descriptions with examples for each of 28 types of ecosystem services;
    - Concise advice about seven cross-cutting issues;
    - Considerations for assessment involving Indigenous communities in Canada;
    - Nine practical worksheets to complete an assessment;
    - Explanations of 11 indicator categories, and an extensive table of indicators for each type of ecosystem service;
    - Clear advice about both economic and socio-cultural approaches to valuation;

- A compendium of factsheets about more than 40 data sources, analysis methods, and tools for ecosystem service assessment;
- Answers to the 45 frequently asked questions (FAQs) posed in the toolkit chapters;
- A glossary of definitions for more than 70 key terms; and
- A reference list of more than 110 Canadian ecosystem service-related analyses.

Footnotes are used throughout the document to clarify and substantiate content, direct users to important resources elsewhere in the Toolkit, and contribute to the resource value of the Toolkit. A complete bibliographic list of sources cited is also included.

For the implementation measure, please indicate to which national or Aichi Biodiversity Target(s) it contributes

- Canada Targets 3, 13, 17
- Aichi Targets 1, 2, 3, 11, 14, 19

Assessment of the effectiveness of the implementation measure taken in achieving desired outcomes:

☐ Measure taken has been effective
☐ Measure taken has been partially effective
☐ Measure taken has been ineffective
☒ Unknown

Please explain the selection and where possible indicate the tools or methodology used for the assessment of effectiveness above

The Toolkit was published February 22, 2017. Groups across Canada and elsewhere are currently studying the Toolkit for advice on how to address aspects of ecosystem services in a wide range of land use planning and management situations. It is too soon to tell how effective it will be.

Other relevant information

The first step in ensuring that the *Ecosystem Services Toolkit* results in desired outcomes is awareness-raising and training on how to use the resource. Since the publication of the Toolkit, presentations about it have been given to audiences in Canada and internationally. For example, it was featured at a Workshop/Meeting of the Canadian Wetlands Roundtable, and at a workshop of the Canadian Council on Ecological Areas and the IUCN Science for Nature and People Partnership working group on the development IUCN guidance on Key Biodiversity Areas and Ecosystem Services. Overview webinars were given through the Ecosystem Based Management Tools Network and the U.S. National Ecosystem Services Partnership, and both are posted online. A series of workshops are planned for Canadian governments at federal, provincial, and territorial levels. The Toolkit was also the subject of a side event at SBSTTA 21.

Relevant websites, web links and files

- The *Ecosystem Services Toolkit* can be accessed through Canada's Biodiversity CHM website at these links:
  - English: http://biodivcanada.ca/default.asp?lang=En&n=B443A05E-1
  - French: http://biodivcanada.ca/default.asp?lang=Fr&n=B443A05E-1 .
- Webinars can be viewed at:

- https://www.openchannels.org/webinars/2017/completing-and-using-ecosystem-service-assessment-decision-making-interdisciplinary
- https://www.youtube.com/watch?v=ja7oejHMc6w&feature=youtu.be

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Describe a measure taken to contribute to the implementation of your country's national biodiversity strategy and action plan

Advancing ecosystem accounting in Canada

Coinciding with the requirements to meet Canada Target 17, Canada's national statistics agency, Statistics Canada, has been developing its capacity to implement the United Nations' *SEEA Experimental Ecosystem Accounting* system (SEEA EEA). Ecosystem accounting is an emerging field within the discipline of environmental accounting, which aims to measure over time ecosystem extent and condition, as well as their capacity to deliver ecosystem services, the quality and beneficiaries of these services, as well as their monetary values. The concepts and methods of environmental accounting are described in the United Nations' *SEEA Central Framework*, which became an international statistical standard in 2012. The concepts and methods of ecosystem accounting are described in the United Nations' *SEEA Experimental Ecosystem Accounting* (*EEA*), also released in 2012, and which will be revised in 2020.

Some national statistical offices, Statistics Canada among them, are working to validate and further develop the concepts and methods described in the *SEEA EEA*. Since the adoption by Statistics Canada of the "Framework for Environmental Statistics" in 2013, the agency has released new natural capital data for Canada's ecosystems in the publication series "*Human Activity and the Environment*". The publication includes data on ecosystem assets and flows of ecosystem services analysed in the context of the Canadian society. The publication presents analysis, data tables, charts, infographics and maps based on data from Statistics Canada and from other federal departments and the provinces. The publication provides useful information for policy makers and the general public, and is also used as an educational resource in school systems. In addition to releases through the above mentioned publication, data are released through Statistics Canada's publicly available online database (see, for example, the Annual water yield for selected drainage regions and Southern Canada).

For the implementation measure, please indicate to which national or Aichi Biodiversity Target(s) it contributes

- Canada Target 17
- Aichi Target 2

Assessment of the effectiveness of the implementation measure taken in achieving desired outcomes

☒ Measure taken has been effective
☐ Measure taken has been partially effective
☐ Measure taken has been ineffective
☐ Unknown

Relevant websites, web links and files

- Statistics Canada, 2013, "*Measuring ecosystem goods and services in Canada*," Human Activity and the Environment 2013, Catalogue no. 16-201-X: https://www150.statcan.gc.ca/n1/pub/16-201-x/16-201-x2013000-eng.htm
- Statistics Canada, 2014, "*What is the value of an ecosystem? Teacher's Kit for Human Activity and the Environment 2013: Measuring ecosystem goods and services in Canada*," Human

Activity and the Environment – Teacher's kit, Catalogue no. 16-507-X: https://www150.statcan.gc.ca/n1/pub/16-507-x/16-507-x2014001-eng.htm

- Statistics Canada, 2014, "*Agriculture in Canada*," Human Activity and the Environment 2014, Catalogue no. 16-201-X: https://www150.statcan.gc.ca/n1/pub/16-201-x/16-201-x2014000-eng.htm
- Statistics Canada, 2015, "*The changing landscape of Canadian metropolitan areas*," Human Activity and the Environment 2015, Catalogue no. 16-201-X: https://www150.statcan.gc.ca/n1/pub/16-201-x/16-201-x2016000-eng.htm
- Statistics Canada, 2016, "*Freshwater in Canada*," Human Activity and the Environment 2016, Catalogue no. 16-201-X: https://www150.statcan.gc.ca/n1/pub/16-201-x/16-201-x2017000-eng.htm
- Statistics Canada, 2017, "*Forests in Canada*," Human Activity and the Environment 2017, Catalogue no. 16-201-X: https://www150.statcan.gc.ca/n1/pub/16-201-x/16-201-x2018001-eng.htm
- United Nations Statistics Division, European Commission, Food and Agriculture Organization of the United Nations, International Monetary Fund, Organisation for Economic Co-operation and Development and The World Bank, 2014, *System of Environmental-Economic Accounting 2012: Central Framework*: http://unstats.un.org/unsd/envaccounting/seeaRev/SEEA_CF_Final_en.pdf
- United Nations, European Commission, Food and Agricultural Organization of the United Nations, Organisation for Economic Co-operation and Development and World Bank, 2014, *System of Environmental-Economic Accounting 2012: Experimental Ecosystem Accounting*: http://unstats.un.org/unsd/envaccounting/seeaRev/eea_final_en.pdf (accessed November 24, 2015).
- Annual water yield for selected drainage regions and Southern Canada: https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=3810028301

Describe a measure taken to contribute to the implementation of your country's national biodiversity strategy and action plan

Education, public awareness and participation in biodiversity conservation

There are many initiatives targeting different audiences across Canada to educate and raise awareness of biodiversity among Canadians, encourage Canadians to connect with nature, and promote participation in conservation activities. Measures are undertaken at the local, sub-national, national and international level. The following list highlights some of those initiatives contributing to raising awareness of biodiversity and connecting Canadians with nature:

- Dechinta Centre for Research and Learning, in Canada's Northwest Territories, is a northern-led school delivering land-based educational experiences led by northern leaders, experts, elders and professors to engage northern and southern youth in a transformative curricula based on the cutting-edge needs of Canada's North. Indigenous and non-Indigenous students learn about the environment, politics and history of Denendeh / Northwest Territories from indigenous experts, leading professors, local leaders and elders through field work, hands on practice, and interaction with the land, people, and communities, including self-governing communities of Northwest Territories. Courses are university-accredited in association with University of Alberta.
- The Nature Conservancy of Canada is a non-profit conservation organization that purchases land or establishes conservation agreements with landowners to contribute to conservation. Their Nature Destinations program invites visitors to explore examples of Canada's natural areas and to connect with nature by providing an interactive online map highlighting conserved areas across the country. The Nature Conservancy of Canada coordinates conservation volunteer events, employs young conservation interns, and connects urban youth to nature through their Nature Days program.
- Students from almost all of Canadian provinces and territories participate in the North American Envirothon, which is an annual environmentally themed academic competition for high school aged students organized by the National Conservation Foundation. The competition is held in Canada and the United States on a regional, state/provincial, and bi-national level. Envirothon is focused on four core topics (forestry, soils, aquatics and wildlife) plus a current environmental issue that connects the four core topics. Focus issues have included climate change, biodiversity, invasive species and sustainable agriculture.
- Earth Rangers is a non-profit children's conservation organization, dedicated to educating children and their families about biodiversity, inspiring them to adopt sustainable behaviours and empowering them to become directly involved in protecting animals and their habitats. Earth Rangers programs are delivered through in-school presentations, a free membership program that gives kids the tools to get involved in a cause they care about, interactive online activities, and guidance to encourage kids to undertake their own conservation initiatives including providing habitat for local wildlife and supporting local conservation organizations. In recent years governments and organizations at various levels across Canada have partnered with Earth Rangers to support their efforts to educate and connect Canadian kids with nature.
- In 2018 the Government of Canada invited proposals for up to $2.25 million in funding over three years to support national programing aimed at educating and engaging children aged 6 to 12 in Canadian wildlife conservation. The funding will support programming that: a) increases kids' knowledge and awareness of Canada's wildlife; b) provides opportunities to get involved in

activities that help conserve nature; and, c) inspires kids to be active stewards of the natural world.

- The Great Trail is one of the world's longest networks of trails, criss-crossing Canada from coast to coast to coast. The Trail now connects 24,000 km of local recreational paths, trails and routes across the country. The Great Trail – Explore Canada mobile application was recently launched. Developed in partnership with mapping firm Esri Canada, the app provides mapping, route-planning, and activity tracking functions for trail-users, and is designed to help build a community of trail users by enabling photo uploads and sharing.
- La faune et vous (i.e. « Wildlife and you ») is a program delivered by the Government of Quebec to teach Grade 6 students about Quebec's wildlife diversity, habitats, and impacts of activities on wildlife through in-class demonstrations and interactive online activities. The program was launched in 2015.
- NatureWatch is an umbrella for several citizen-based monitoring programs including FrogWatch, IceWatch, PlantWatch, Wormwatch, the recently launched MilkweedWatch and soon-to-be launched (2018) Arctic Wildlife Watch. NatureWatch has been engaging Canadians in environmental monitoring since 2000. A new mobile-friendly NatureWatch website was launched in 2014 with enhanced tools for identifying species and mapping user observations. Since 2014, the program has significantly expanded its reach, engaged new partners and launched various collaborations and activities including partnerships with the National Hockey League, eco-tourism companies, Inuit youth groups, primary school teachers, Scouts Canada and the Canadian Museum of Science and Technology. Students and researchers use NatureWatch data for scientific purposes, and the program encourages Canadians of all ages to connect with Canada's natural environment.

For the implementation measure, please indicate to which national or Aichi Biodiversity Target(s) it contributes

- Canada Targets 18 and 19
- Aichi Target 1

Assessment of the effectiveness of the implementation measure taken in achieving desired outcomes

☒ Measure taken has been effective
☐ Measure taken has been partially effective
☐ Measure taken has been ineffective
☐ Unknown

Please explain the selection and where possible indicate the tools or methodology used for the assessment of effectiveness above

Many initiatives aimed at educating, raising public awareness and encouraging participation in nature conservation are underway across Canada each year. The effectiveness of each initiative has not been systematically assessed for this report. However, a number of the initiatives highlighted above have published outcomes demonstrating their positive impact on engaging Canadians in conservation. For example:

- The Nature Conservancy of Canada engaged 2,472 volunteers to complete 224 stewardship projects across Canada in 2016-17, hired 62 young Conservation Interns, and gave 105

elementary and high school students from Montreal and Calgary the opportunity to spend time in nature, explore local species and natural systems and learn about conservation action through hands-on activities supporting experts in the field.

- In Ontario, for example, more than 1000 students from 200 schools participate annually in provincial-level Envirothon workshops, field trips and 24 regional competitions. Ontario hosted the 2016 North American Envirothon event involving 500 participants from 50 state and provincial teams. An Ontario team won the competition. Ontario's Envirothon program has 10,000 alumni who have gained a greater understanding of Canada's natural ecosystems and the role that they can play as champions of sustainability.
- Earth Rangers in-school presentation is delivered in hundreds of schools across Canada each year, reaching nearly a quarter of a million children. Nearly 200,000 Canadian kids have joined as Earth Rangers members. In 2017-18 nearly 10,000 members accepted the mission to plant a tree in their community and members raised over $27,000 (CAD) to help a researcher at the University of Alberta study the impacts of climate change on the Snowshoe Hare.
- 80% of Canadians live within 30 minutes of the Trail and millions of Canadians and international visitors are using it to hike, cycle, ski, horseback ride, canoe and snowmobile. The Great Trail offers countless opportunities to explore Canada's diverse landscapes and rich history.

Relevant websites, web links and files

- Dechinta Centre for Research and Learning: http://dechinta.ca/
- Nature Conservancy of Canada's Nature Destinations: http://naturedestinations.ca/?url=http://naturedestinations.ca/wp-ncc/
- Earth Rangers: https://www.earthrangers.com/
- The Great Trail: https://thegreattrail.ca/
- La faune et vous (Wildlife and you): http://pleinderessources.gouv.qc.ca/fiche/faune-vous-programme-educatif-44.html
- NatureWatch: https://www.naturewatch.ca/

Other relevant information

The initiatives above illustrate the various ways in which biodiversity is mainstreamed through education, public awareness, communication, and by connecting Canadians personally with nature. The outcomes of these projects directly contribute to Goal D of Canada's 2020 Biodiversity Goals and Targets: By 2020, Canadians are informed about the value of nature and more actively engaged in its stewardship and the targets in this goal, Targets 18 and 19.

Section III. Assessment of progress towards each national target

Progress assessment: Canada Target 1

By 2020, at least 17% of terrestrial areas and inland water, and 10% of marine and coastal areas, are conserved through networks of protected areas and other effective area-based conservation measures.

Category of progress towards the implementation of the selected target

17% of terrestrial areas and inland water

- ☐ On track to exceed target
- ☐ On track to achieve target
- ☒ Progress towards target but at an insufficient rate
- ☐ No significant change
- ☐ Moving away from target
- ☐ Unknown

10% of marine and coastal areas

- ☐ On track to exceed target
- ☒ On track to achieve target
- ☐ Progress towards target but at an insufficient rate
- ☐ No significant change
- ☐ Moving away from target
- ☐ Unknown

Date the assessment was done

July 31, 2018

Additional information

Canada has taken major steps since 2015 to make progress toward achieving Canada Target 1 through initiatives coordinated across federal departments and agencies, in collaboration with provinces, territories, Indigenous groups, industry groups, marine resource users, and other stakeholders. The public is also consulted on measures to protect Canada's marine and coastal areas.

Launched in 2017, the Pathway to Canada Target 1 initiative is a major multi-partner national initiative to increase action and coordinate and encourage progress to meet the terrestrial areas and inland waters component of Target 1. Details on the Pathway to Canada Target 1 initiative can be found in Section II of this report. Work on this initiative is ongoing and its impact in helping Canada meet Target 1 is expected to be positive, but not yet fully known. The Government of Canada in 2018 announced the creation of a Canada Nature Fund, which includes a significant investment to support the Pathway to Canada Target 1 initiative such as the establishment of additional protected and conserved areas.

Efforts in recent years to make progress toward the marine and coastal areas component of Target 1 have put Canada on track to meet its 10% target by 2020. Canada has surpassed its interim target of 5% marine protection by 2017 and recognizes 7.7% of its marine territory as conserved as announced on December 21, 2017. These protected and conserved areas are found throughout many marine bioregions, which include unique and representative marine ecosystems. Progress towards the 10% target is ongoing and on track to be achieved by 2020. Canada has outlined its approach for achieving these milestones through a five-point plan to meet its marine conservation targets, as described in section II.

Indicators used in this assessment

1. Percentage of total terrestrial territory (including inland water) conserved in protected areas and other effective area-based conservation measures
2. Percentage of total coastal and marine territory conserved in marine protected areas and other effective area-based conservation measures

Relevant websites, web links and files

- Canada's Marine Conservation Target 5 percent Achieved: http://www.dfo-mpo.gc.ca/oceans/conservation/achievement-reussite-eng.html
- Canada's protected areas: https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/conserved-areas.html
- Conservation 2020: http://www.conservation2020canada.ca

Level of confidence of the above assessment

☐ Based on comprehensive evidence
☒ Based on partial evidence
☐ Based on limited evidence

Please provide an explanation for the level of confidence indicated above

The assessment of the target indicated above has been based on partial evidence.

Canada is currently on track to achieve the marine and coastal component of the target based on its achievements to date, its plan for meeting the 2020 target over the next few years, and Canada's commitment to the target including from national, sub-national governments and Indigenous governments and many other conservation partners.

Recognizing and creating protected and conserved terrestrial and freshwater areas requires consultation and collaboration with a significant number of parties. While the Pathway to Canada Target 1 has significantly improved collaboration, there is much work still to be done. Establishment processes for protected areas, Indigenous Protected and Conserved Areas (IPCAs) and other effective area-based conservation measures (OECMs) are dependent on a variety of factors, including partner and stakeholder support, and are time-consuming processes that are ambitious to achieve under the current timeframe. Further, the scale of the challenge is ambitious. Between now and the end of 2020, Canada needs to protect and conserve an area roughly equal to any one of the three Prairie Provinces. These factors lead to the present level of confidence.

Adequacy of monitoring information to support assessment

☐ Monitoring related to this target is adequate
☒ Monitoring related to this target is partial (e.g. only covering part of the area or issue)
☐ No monitoring system in place
☐ Monitoring is not needed

Please describe how the target is monitored and indicate whether there is a monitoring system in place

The indicator for Canada Target 1 is monitored through inventorying protected areas and OECMs, and calculating percent coverage. Data are updated annually through the Canadian Environmental Sustainability Indicator on Protected and Other Conserved Areas and submitted to the World Database on Protected Areas (WDPA).

Progress toward Canada Target 1 contributes directly to the global effort to achieve Aichi Target 11. Aichi Target 11 includes elements beyond percent coverage, which are not explicit in the wording of Canada Target 1 (e.g., effective and equitable management, representativity, connectivity, integration into wider landscapes and seascapes). These elements are all considerations in Canada's broader approach to biodiversity conservation, and efforts are underway that continue to address these elements. Most, with the exception of representativity, are not consistently monitored across the country. Ecological representation of Canada's protected areas is reported annually through the Canadian Environmental Sustainability Indicator on Protected and Other Conserved Areas.

Efforts are underway to ensure that protected areas and OECMs are managed and monitored at the site level to ensure their long-term contributions to biodiversity conservation. According to the Canadian Protected Areas Status Report (2012-2015), most of the government protected areas organisations have made progress on the development and implementation of management plans for protected areas. Some management authorities, including Parks Canada, have in place standard monitoring regimes applied throughout their entire protected areas system. However, management and site-specific monitoring are resource-intensive and gaps remain.

For marine refuges (marine OECMs), effectiveness will be monitored by a range of tools, including consideration of any available new science, compliance reviews, and management planning as part of the regular update of Integrated Fisheries Management Plans. If the objectives for the marine refuges include specific species covered by stock assessments, the stock assessments will feed into monitoring and adaptive management of the marine refuge.

In addition, efforts are underway, and will extend beyond 2020, to develop a national network of MPAs in Canada's oceans and Great Lakes (freshwater). Once developed, the national MPA network will increase representation, provide connectivity between protected areas, and increase integration into wider seascapes.

Relevant websites, web links and files

- Canada's Protected and Other Conserved Areas: https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/conserved-areas.html
- Canadian Environmental Sustainability Indicator on Protected Areas
- Canadian Protected Areas Status Report 2012 to 2015 – Chapter 3: https://www.canada.ca/en/environment-climate-change/services/wildlife-habitat/publications/protected-areas-report-2012-2015/chapter-3.html#_3
- The State of Canada's Natural and Cultural Heritage Places Administered by Parks Canada: https://www.pc.gc.ca/en/docs/pc/rpts/elnhc-scnhp/2016/part-b

Progress assessment: Canada Target 2

By 2020, species that are secure remain secure, and populations of species at risk listed under federal law exhibit trends that are consistent with recovery strategies and management plans.

Category of progress towards the implementation of the selected target

☐ On track to exceed target
☐ On track to achieve target
☒ Progress towards target but at an insufficient rate
☐ No significant change
☐ Moving away from target
☐ Unknown

Date the assessment was done

January 31, 2018

Additional information

Canada is making progress toward this target. However, as explained below, the data does not show strong enough evidence to indicate that the target is being met yet, both for the recovery objectives and the re-assessment of species, or that the target will be achieved by 2020 despite favourable progress.

Of 113 species for which population trends could be determined, 49 (43%) show progress towards their population objectives and 51 species (45%) do not show progress, while the remaining species show some indicator of both improvement and decline (June 2018).

Further, of the 455 wildlife species for which sufficient data are available to determine if there has been a change in status, 83 (18%) are in a higher risk category, 80 (18%) are in a lower risk category, and 292 (65%) show no change in status (June 2018).

Finally, between 2000 and 2005, the proportion of species ranked as secure varied between 70% and 80%. This variation is due mainly to the assessment of additional species. The Wild Species 2015 report assessed the conservation status of 29,848 species in 34 species groups. 16,078 native species were assigned a national extinction risk level. Of those species, 80% are ranked as secure or apparently secure, 10% are vulnerable and 10% are imperiled or critically imperiled. Less than 1% are presumed extirpated or possibly extirpated (May 2018).

Evidence is gathered through the Canadian Environmental Sustainability Indicators (CESI) program, which provides data and information to track Canada's performance on key environmental sustainability issues including climate change and air quality, water quality and availability, and protecting nature. The environmental indicators are based on objective and comprehensive information and convey environmental trends in a straightforward and transparent manner. Evidence used for the three indicators are largely drawn from the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) status assessments and the Wild Species reports (Canadian Endangered Species Conservation Council).

In June 2018, Federal-Provincial-Territorial Ministers responsible for parks, protected areas, conservation, wildlife and biodiversity met and agreed to a Pan-Canadian Approach to Transforming Species at Risk Conservation. Ministers agreed to a new set of principles to help guide collaborative implementation work including, but not limited to: a multi-species and ecosystem-based approach; strengthened partnerships; Indigenous engagement; improved monitoring and reporting. Within the new approach, shared priorities are focused on priority places, species and threats. The Pan-Canadian Approach is intended to achieve better conservation outcomes for more species at risk, improved return on investments, and increased co-benefits for biodiversity and ecosystems.

Through the Government of Canada's Nature Legacy, the Canada Nature Fund will enable partners to contribute to the protection and recovery of species at risk and other biodiversity through innovative, multi-species and ecosystem-based actions for priority species, places and sectors. Initiatives will support priorities for action and build relationships with Indigenous peoples, provinces and territories, environmental non-government and community-based organizations, industry, municipalities and communities, landowners and resource users, academia and other partners for terrestrial and aquatic species at risk. Over $200 million over five years will be available through the Canada Nature Fund Species stream for projects to enhance the protection and recovery of terrestrial and aquatic species at risk.

Indicators used in this assessment

1. Species at risk population trends (i.e. trends in population sizes of species at risk compared to federal recovery strategy objectives)
2. Changes in wildlife species disappearance risks
3. Trends in the general status of wild species

Please describe any other tools or means used for assessing progress

A scan into provincial and territorial reporting and indicators was conducted to see if there were commonalities in the data that was reported. Unfortunately, it was noted that several provinces and territories lack recent reporting data on the state of their species at risk. For the provinces and territories that do have recent data, it is noted that trends analysis and priority species are the most common indicators used.

Relevant websites, web links and files

- GoC Wildlife and habitat indicators: https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/wildlife-habitat.html
- Data sources and methods for CESI indicators: https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/publications.html
- General Status of Species Reports (2000, 2005, 2010, 2015): http://www.registrelep-sararegistry.gc.ca/sar/assessment/general_e.cfm

Level of confidence of the above assessment

☒ Based on comprehensive evidence
☐ Based on partial evidence
☐ Based on limited evidence

Please provide an explanation for the level of confidence indicated above

These indicators are based on sound methodology, and while based on comprehensive evidence, there are still some known limitations, as explained below.

Indicator 1: Coverage of species in the indicator is very narrow compared to the number of wildlife species assessed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) as Extirpated (23), Endangered (321), Threatened (172) or of Special concern (219), or compared to the number of species listed on Schedule 1 of the Species at Risk Act as Extirpated (23), Endangered (241), Threatened (127), or of Special concern (130).

It takes time for response to become apparent, particularly for those species that have longer regeneration times and/or fewer offspring (i.e., while an insect population might begin to recover in a few years, it can take decades to detect changes in whale populations). While the indicator uses the best information available, this may include periods of time before recovery documents were finalized. Indicator results should not be interpreted as a measure of recovery success until sufficient time has passed to at least potentially allow a species to recover and to collect sufficient information to assess that recovery. Observations of rare species are often difficult to collect, and assessments are necessarily based on incomplete information.

With time, the number of species with completed recovery documents and the number of reassessed species will increase, and trends will become more meaningful as populations have sufficient time to respond.

Indicator 2: Knowledge of which wildlife species may be at risk is far from complete, and only a portion of those suspected to be at risk can be assessed. The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) prioritizes assessments based on expert opinion. Early efforts focused mainly on vertebrates and plants, and these are also the best-known wildlife species. As a result, these wildlife species are over-represented among wildlife species that have been reassessed. Similarly, knowledge of wildlife species is greatest in southern Canada and in terrestrial systems. Species that are at risk can take a long time to recover, especially if they are long-lived and slow to reproduce. Additionally, improvements to habitat, for example, can take many decades. Under the federal *Species at Risk Act* (SARA), COSEWIC is required to reassess wildlife species previously designated in a category of risk with an update status report every 10 years or earlier.

Many wildlife species in Canada have not yet been assessed by COSEWIC, but are suspected of being at some risk of extinction or extirpation. These wildlife species, referred to as candidate wildlife species, are identified and prioritized by the Species Specialist Subcommittees or by the Aboriginal Traditional Knowledge Subcommittee as candidates for detailed status assessment. Candidates may also include wildlife species already assessed by COSEWIC as ‘not at risk’ or ‘data deficient’, but where new information suggests they may be at risk.

Indicator 3: The number of species assessed in the Wild Species series has increased from 1670 in 2000 to 11 950 in 2010 and almost 30,000 in 2015. However, with an estimated 80,000 species found in Canada (*Wild Species 2015*), there are still many species left to assess, with the vast majority of these

species being insects and other invertebrates. The General Status of Species indicator reflects the state of biodiversity in Canada. However, it only represents species diversity and does not report on genetic and ecosystem diversity. Therefore, this indicator provides a picture of only one aspect of biodiversity in Canada.

Adequacy of monitoring information to support assessment

☐ Monitoring related to this target is adequate
☒ Monitoring related to this target is partial (e.g. only covering part of the area or issue)
☐ No monitoring system in place
☐ Monitoring is not needed

Please describe how the target is monitored and indicate whether there is a monitoring system in place

Indicator 1 on species at risk population trends: The indicator provides an assessment of the recovery trends of species at risk that: 1) are included on the List of Wildlife Species at Risk under the federal Species at Risk Act; 2) have a final recovery strategy or management plan that contains population objectives; 3) are determined to be biologically and technically feasible to recover if listed as Extirpated, Endangered or Threatened, and; 4) have been reassessed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) since the final recovery document (recovery strategy or management plan) was published. Assessment is typically done every 5 years.

Indicator 2 on changes in wildlife species disappearance risks: The indicator reports on changes in wildlife species disappearance risks in Canada for species assessed by COSEWIC. COSEWIC is composed of experts that determine the national status of Canadian wildlife species, subspecies, varieties or other designatable units that are suspected of being at risk of extinction or extirpation. The indicator measures conservation effectiveness and is developed with data provided by COSEWIC's Secretariat. Of note, in general, wildlife species are reassessed every 10 years, and reporting is done every 5 years, based on available data.

Indicator 3 on trends in the general status of wild species: The General Status indicator summarizes the state of individual species in Canada. A "species" is defined as a population of organisms that does not usually interbreed with other populations, even where they overlap in space and time (Canadian Endangered Species Conservation Council [CESCC] 2011). The general status indicator provides a measure of extinction risk and an indication of the overall state of biodiversity in Canada, since the loss of a species is a loss of biodiversity. To better understand which species are at risk, a companion indicator provides information on extinction risk for species group. The status of wild species is generally reassessed by the CESCC every five years. The first assessment was done in 2000 for 1,670 species (CESCC 2001). New species groups were added in subsequent reports and in 2005, 7,732 species were assessed (CESCC 2006). In 2010, 11,950 species were assessed and fish species were not reassessed (CESCC 2011). In 2015, 29,848 species were assessed.

Relevant websites, web links and files

- GoC Wildlife and habitat indicators: https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/wildlife-habitat.html

- Data sources and methods for CESI indicators: https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/publications.html
- General Status of Species Reports (2000, 2005, 2010, 2015): http://www.registrelep-sararegistry.gc.ca/sar/assessment/general_e.cfm
- List of Wildlife Species at Risk: http://www.sararegistry.gc.ca/species/default_e.cfm

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Progress assessment: Canada Target 3

By 2020, Canada’s wetlands are conserved or enhanced to sustain their ecosystem services through retention, restoration and management activities.

Category of progress towards the implementation of the selected target

☐ On track to exceed target
☒ On track to achieve target
☐ Progress towards target but at an insufficient rate
☐ No significant change
☐ Moving away from target
☐ Unknown

Date the assessment was done

March 31, 2017

Additional information

This target highlights the important role that stewards of Canada's wetlands have in maintaining the health and wellbeing of a vital ecosystem that benefits all Canadians. In fact, great efforts to protect and conserve wetlands are underway. Millions of hectares of wetlands have been conserved as part of Canada’s network of protected areas, established by governments, and other types of conservation areas established by private land owners, conservation organizations, and local communities. Despite these efforts, declines and degradation continue. Continued commitment and collaboration by many players, including municipal and regional land use planners, developers, industry and agriculture sectors, and recreational users will be vital.

The Ramsar Convention on Wetlands provides the framework for the conservation and wise use of wetlands and their resources. Participation in Ramsar and the commitments therein are an important factor in Canada’s implementation of the North American Waterfowl Management Plan (NAWMP), and various federal and provincial policy initiatives, including the Federal Policy on Wetlands Conservation (1991). Canada’s 2018 National Report to the Ramsar Convention presents Canada’s progress against the Ramsar Strategic Plan over the last 3 years (2014-2017). It includes relevant information to assess progress towards the implementation of this target. A link to the report can be found in the relevant websites, web links, and files section.

Implementation of NAWMP, an international action plan to conserve waterfowl throughout Canada, United States of America and Mexico, continues to be the cornerstone of wetland and waterfowl conservation in Canada. Working with private landowners and governments, NAWMP has helped reduce the rate of loss and degradation since 1986 by protecting and restoring wetlands, establishing conservation agreements, and influencing stewardship activities of landowners, farmers, land managers and conservation agencies. Between 1986 and March 31, 2017, 8.5 million hectares of wetlands and associated uplands have been retained in Canada under the auspices of the Plan, and 6.6 million hectares have been restored and/or managed. In particular, between January 1, 2013 and March 31, 2017, over 550,000 hectares of wetlands and associated uplands were retained and over 1.7 million hectares were restored and/or managed by NAWMP partners *(*see the chart in the linked attachment in the relevant

websites, web links, and files for more information*: Cumulative area of wetlands and associated uplands conserved in Canada under the North American Waterfowl Management Plan (1986-2017).*

While, NAWMP partners in Canada cover a vast amount of land, there are still segments of the country that are left unaccounted for in this assessment. Thus, the main obstacle to achieve a complete assessment is that it is not yet possible to assess the gains and/or losses in the extent of wetlands for Canada as a whole. Studies examining wetland trends are localized and vary in scale. That being said, the ongoing development of *Extent of Canada's Wetlands Indicator* under the Canadian Environmental Sustainability Indicators program will offer a comprehensive national wetland inventory.

A few examples of other recent key accomplishments

New and improved policies and legislation continue to guide wetland conservation in Canada. For example, A Wetland Conservation Strategy for Ontario 2017-2030 is a framework to guide the future of wetland conservation in the province. It includes a vision, goals and desired outcomes, and a series of actions the Ontario government has begun or will undertake by 2030. Manitoba's new Peatlands Stewardship Act (2014), which came into effect in 2015, promotes the protection and conservation of peatlands and Quebec's new Act respecting the conservation of wetlands and bodies of water (2017) reforms the legal framework in order to modernize the measures that ensure wetland conservation and their sustainable use.

In 2014, the Federal Government of Canada announced an investment of $50 million over five years to restore degraded wetlands through the delivery of the National Wetland Conservation Fund. Between September 2014 and March 2016, multiple partners invested more than $41 million in over 130 National Wetland Conservation Fund projects. These wetland restoration/enhancement and science projects restored over 1,000 hectares of wetland habitat and associated uplands, enhanced over 318,000 hectares of land, and contributed to improving water quality for fish, waterfowl, and other wildlife.

Provincially, there are many wetland securement/restoration/rehabilitation projects or programs that deliver results. For example, through the Canada-Ontario agreement, between 2007 and 2017 Ontario has invested $10.65 million in 73 individual wetland, restoration, enhancement, monitoring and assessment, evaluations and research projects in the Great Lakes basin. This funding has been leveraged by partners, community groups, individual landowners and other government agencies on the landscape. As noted in Canada's 5th National Report, Alberta issued the Alberta Wetland Policy in 2013. The policy was implemented in 2015 and has been in place since then.

Ducks Unlimited Canada, the Nature Conservancy of Canada and many other non-governmental organizations also actively contribute to wetland conservation through securement, restoration and management projects, including for example the installation of ditch plugs, to restore wetlands that have been drained for agriculture as well as the replacement of water control structures and spillways to allow for better habitat management and the implementation of modified grazing practices.

Many reclamation projects have been undertaken by or with support from industry. For example, Suncor Energy, with the collaboration of researchers from the University of Waterloo, has led pioneering fen research and the opening of a reconstructed fen at a reclamation site. In 2013, Suncor marked a milestone

in wetland reclamation – the official opening of the first Canadian reconstructed fen planned to emulate the properties of a natural fen. This fen connects wetland conservation with an Indigenous community.

In 2016, Environment and Climate Change Canada developed a new indicator, "Extent of Canada's Wetlands", under the Canadian Environmental Sustainability Indicators program. Canada has about 1.29 million km^2 of wetlands, covering 13% of Canada's terrestrial area. The indicator provides a baseline (circa 2000) from which change can be measured in the future.

Indicators used in this assessment

1. Habitat area retained, managed, and restored under the North American Waterfowl Management Plan.

Please describe any other tools or means used for assessing progress

Canada's 2018 National Report to the Ramsar Convention was submitted to the Ramsar Secretariat in February 2018. The report was prepared by Environment and Climate Change Canada with input from other federal departments, provinces and territories, non-governmental organizations, universities and industry. The report presents Canada's progress against the Ramsar Strategic Plan over the last 3 years (2014-2017). It includes relevant information to assess progress towards the implementation of the target.

Relevant websites, web links and files

- Canadian Habitat Matters - NAWMP Annual Reports: http://nawmp.wetlandnetwork.ca/publications/
- Extent of Canada's wetlands: https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/extent-wetlands.html
- Canada's National Reports to Ramsar Convention: https://www.ramsar.org/search?f[2]=type%3Adocument&f[0]=field_tag_countries%3A173&f[1]=field_document_type%3A532
- Linked attachment: Cumulative area of wetlands and associated uplands conserved in Canada under the North American Waterfowl Management Plan (1986-2017): http://twk.pm/n43xgcq1zh

Level of confidence of the above assessment

☐ Based on comprehensive evidence
☒ Based on partial evidence
☐ Based on limited evidence

Please provide an explanation for the level of confidence indicated above

Interest in wetland conservation is increasing in Canada, as demonstrated by the development of new policies and programs. The North American Waterfowl Management Plan continues to be very successful in Canada and gains for wetlands conservation are made each year. However, it is not yet possible to assess objectively gains and/or losses in the extent of wetlands for Canada as a whole.

Adequacy of monitoring information to support assessment

☐ Monitoring related to this target is adequate
☒ Monitoring related to this target is partial (e.g. only covering part of the area or issue)
☐ No monitoring system in place

☐ Monitoring is not needed

Please describe how the target is monitored and indicate whether there is a monitoring system in place

In addition to the triennial reporting to the Ramsar Convention that provides evidence of key achievements regarding wetlands conservation and sustainable use, the North American Waterfowl Management Plan National Tracking System tracks the contributions, expenditures, and accomplishments of the Canadian program. It is used to develop annual program reports (Habitat Matters). Tracked accomplishments for all partners in Canada include habitat retained, habitat restored and habitat managed.

In the future, Canada's new Extent of Canada's Wetlands Indicator under the Canadian Environmental Sustainability Indicators program can be used to measure changes in Canada's wetland coverage.

There are also subnational monitoring systems in place for parts of the country. For example, the *State of Ontario's Biodiversity* report (2015) includes an Extent of Wetland Cover and Wetland Lost indicator that assesses changes in wetland extent in southern Ontario from 2000-2002 to 2011 based on updated land cover information.

Relevant websites, web links and files

- Canadian Habitat Matters - NAWMP Annual Reports: http://nawmp.wetlandnetwork.ca/publications/
- Extent of Canada's wetlands: https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/extent-wetlands.html
- State of Ontario's Biodiversity Report 2015: Extent of Wetland Cover and Wetland Lost: http://sobr.ca/_biosite/wp-content/uploads/Indicator-Extent-of-Wetland-Cover-and-Wetland-Loss-_May-19-2015.pdf

Progress assessment: Canada Target 4

By 2020, biodiversity considerations are integrated into municipal planning and activities of major municipalities across Canada.

Category of progress towards the implementation of the selected target

☐ On track to exceed target
☒ On track to achieve target
☐ Progress towards target but at an insufficient rate
☐ No significant change
☐ Moving away from target
☐ Unknown

Date the assessment was done

March 31, 2018

Additional information

Biodiversity considerations continue to be integrated into municipal planning and activities of major municipalities across Canada and therefore Canada is on track to achieve this target.

In late 2017, ICLEI Canada undertook a survey of Canadian municipalities to gather data to report on this target. The Survey on Canadian Municipal Action on Biodiversity was administered by the Canadian Office of ICLEI – Local Governments for Sustainability. Municipal representatives were asked to complete a short survey to demonstrate how their municipality engages in biodiversity conservation. The survey builds on a similar survey of Canadian municipalities that was conducted in 2014, with some slight modifications to the questions to enable more precise analysis of the data.

The indicators associated with this target focus on medium and large population centres, which in Canada are municipalities with populations of 30,000 to 99,999 and 100,000 or more, respectively. In total, 54 Canadian municipalities responded to the voluntary survey. The total number of respondents from large and medium municipalities is 46, consisting of 34 large and 12 medium sized population centres. The remaining respondents were small municipalities with populations less than 30,000. As of the most recent census, in 2016, Canada had 3 large population centres, 57 medium population centres, and 918 small population centres.

Twenty-three municipalities (representing 51% of the 46 medium and large sized municipalities that responded to the 2017 survey) indicated that they either have a dedicated biodiversity policy or strategy (14 municipalities) or have one in development (9 municipalities). 22 municipalities (or 49% of respondents) indicated they did not have one in place. One municipality did not provide a response. In 2014, 4 of the 16 medium and large sized municipalities (25%) that responded to the survey reported that they had a dedicated biodiversity policy or strategy.

Forty-two municipalities (representing 91% of the 46 medium and large sized municipalities that responded to the 2017 survey) indicated they have biodiversity objectives in municipal planning documents. A full report presenting the findings of the 2017 survey and a number of relevant case studies is provided as a linked attachment, in the relevant websites, web links, and files for more information. Changes in the survey methodology make it impossible to compare this with results from 2014.

Indicators used in this assessment

1. The number of medium and large population centres that have developed biodiversity conservation strategies.
2. The number of medium and large population centres that have biodiversity objectives in municipal planning documents.

Note:

- Medium (30,000 - 99,999 population)
- Large (>= 100,000 population)

Please describe any other tools or means used for assessing progress

In addition to medium and large population centres, the 2017 survey gathered data from some small Canadian municipalities (population of 1,000 – 29,999). Results for these small municipalities are included in the report provided as a linked attachment in the relevant websites, web links, and files.

ICLEI Canada's survey analysis report includes a number of case studies demonstrating how Canadian municipalities are integrating biodiversity considerations into municipal planning and activities.

Relevant websites, web links and files

- Linked attachment: Analysis Report: Survey on Canadian Municipal Action on Biodiversity: http://twk.pm/46c5e4i3h4

Level of confidence of the above assessment

☐ Based on comprehensive evidence
☒ Based on partial evidence
☐ Based on limited evidence

Please provide an explanation for the level of confidence indicated above

There are some limitations to the survey method. Survey responses were gathered using a targeted list, on a voluntary basis, over a limited time period, and the results represent many but not all major municipalities. Further, survey responses were based upon the professional knowledge of the individuals responding to the survey, and therefore may be limited to their scope of awareness and knowledge. As well, since municipalities across Canada are very diverse, there may be inconsistencies in the interpretation, and the application, of biodiversity practices and considerations in the context of municipal operations. Finally, the 2014 and 2017 surveys utilize comparable, but not identical, methodologies making direct comparisons of results for both indicators impossible.

Adequacy of monitoring information to support assessment

☐ Monitoring related to this target is adequate
☒ Monitoring related to this target is partial (e.g. only covering part of the area or issue)
☐ No monitoring system in place
☐ Monitoring is not needed

Please describe how the target is monitored and indicate whether there is a monitoring system in place

The Canadian Office of ICLEI – Local Governments for Sustainability has been working since 2009 with Canadian municipalities to raise their awareness of biodiversity issues, profile the champions and stewards of biodiversity, and to create a platform for sharing ideas. ICLEI supported the monitoring of

this target by administering a survey on Canadian Municipal Action on Biodiversity. The survey was conducted in 2014 and 2017 upon request from Environment and Climate Change Canada.

Relevant websites, web links and files

- ICLEI Canada's work on biodiversity can be found here: http://icleicanada.org/programs/biodiversity

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Progress assessment: Canada Target 5

By 2020, the ability of Canadian ecological systems to adapt to climate change is better understood, and priority adaptation measures are underway

Category of progress towards the implementation of the selected target

☐ On track to exceed target
☒ On track to achieve target
☐ Progress towards target but at an insufficient rate
☐ No significant change
☐ Moving away from target
☐ Unknown

Date the assessment was done

February 28, 2018

Additional information

Canada is on-track to achieve Target 5. Following are examples of work underway to support achieving this target.

Government of Canada – Reports and Assessments

Four Large Aquatic Basin Risk Assessments covering the Pacific, Arctic, Atlantic Oceans and Canada's inland waters to analyze climate trends and projections to support climate-sensitive decisions about aquatic ecosystem resource management activities.

Canada in a Changing Climate: Sector Perspectives on Impacts and Adaptation: a national-scale scientific assessment on the impacts of climate change in Canada was published by the Government of Canada in 2014; which includes a chapter on biodiversity and protected areas and natural resources (e.g., forestry).

Canada's Marine Coasts in a Changing Climate: a sectoral assessment published by the Government of Canada on the impacts of climate change on Canada's coasts, including challenges and opportunities for coastal ecosystems. The assessment highlights the adaptation measures that are being adopted in different coastal regions (e.g., use of natural infrastructure as an alternative to hard coastal protection measures to reduce climate risks) and adapting to ensuring the continued health and biodiversity of Canada's coastal ecosystems and the services that they provide.

Government of Canada – Plan/Management/Land Use Plans

The *Pan-Canadian Framework on Clean Growth and Climate Change* is the federal, provincial, and territorial governments plan to reduce emissions, grow the economy and build climate resilience. It underscores the significant risks that climate change impacts pose to the natural environment and identifies areas to take action to improve access to climate science and information that supports adaptation decision-making, including related to protecting, and enhancing ecosystems and biodiversity from the impacts of climate change. As part of the Pan-Canadian Framework on Clean Growth and Climate Change, the Working Group Report on Adaptation and Climate Resilience presents options to

build climate resilience in Canada, and includes a priority area for action on promoting healthy ecosystems and healthy people by advancing ecosystem resilience as an adaptation solution, and integrating climate change considerations into natural resource management and biodiversity conservation decisions.

Funding Programs

Indigenous Community-Based Climate Monitoring Program: A climate change funding opportunity to support Indigenous peoples in monitoring the effects of climate change in their communities. Projects under the program will need to consider key climate indicators related to ecosystem health and biodiversity, such as wildlife and vegetation including population, distribution, health and seasonal timing of plants and animals; habitat quality; species at risk; and invasive species. This program was developed as part of the Pan-Canadian Framework on Clean Growth and Climate Change.

Coasts: *Atlantic Ecosystems Initiative* (AEI): With funding from the Government of Canada, a total of $1.3 million was awarded to eight projects that focus on water quality, habitat and biodiversity, and the impact of climate change. The AEI aims to improve the health, productivity and long-term sustainability of ecosystems throughout Atlantic Canada.

The Gulf of Maine Initiative (GMI): Projects funded through the GMI support decision making and/or actions that encourage responsible development by increasing the understanding and monitoring of ecosystem health, identifying and reducing key stressors to ecosystem health, and implementing activities that contribute to a healthy ecosystem.

Green Climate Fund (GCF): The Government of Canada has pledged $300 million to the Green Climate Fund. By supporting the GCF, Canada helps to promote climate-resilient development pathways by providing support to developing countries. The resilience of ecosystems and the services that they provide for adaptation is one of the eight strategic results areas of the GCF.

Decision-Support Tools

Adaptation: *Canada's Climate Change Adaptation Platform*: This includes representatives from federal, provincial, and territorial governments, industry, Indigenous, professional, and not-for-profit organizations, and has working groups that are advancing work towards reaching biodiversity and protected areas targets including related to forestry, biodiversity, and coastal management. *Biodiversity Adaptation Working Group,* co-chaired by the Government of Canada and Government of Saskatchewan, to advance climate change and biodiversity conservation and adaptation; and has built a network and share information including adaptation best practices and efforts to mainstream adaptation into biodiversity conservation activities.

Agriculture and Agri-Food: Providing timely information on weather and climate data relevant to the agricultural sector in Canada (e.g., *Drought Watch* and projected future *agro-climate information*); conducts and supports research to better understand climate change impacts on agricultural production and inform adaptation options; delivers the *AgriRisk Initiatives* program supporting research and development, as well as the implementation and administration of new risk management tools for use in the agriculture sector to inform adaptation planning; supports a suite of business risk management

programs providing producers with coverage to manage income risks (e.g. income losses from weather, pest/disease, etc.) and helps producers recover from extreme weather events; and cost-shares with provincial and territorial governments on programs that assess on-farm environmental risks and provide incentives to adopt beneficial practices to address these risks and improve climate resiliency.

Forests: Forest scientists have developed, and are continuing to develop, a range of tools for assessing and managing climate-related risks and adaptation options, for example: an extensive reference list of adaptation resources; updates to Canada's plant hardiness zones showing changes in the hardiness zones consistent with climate change; and the development of frameworks, guidebooks (e.g., *Guidebook on Assessing Vulnerability and Mainstreaming Adaptation into Decision Making*) and tools to help forest management practitioners better understand sources of vulnerability and potential ways to adapt. The adaptation framework in the Guidebook is being piloted in several case studies across the country. In addition, industry is exploring new markets for beetle-killed wood, and some forest companies have started using high-flotation tires to navigate wet areas, allowing them to extend their operating season. Scientists are also incorporating climate conditions into research and planning tools. An additional key tool is *Canada's National Forest Inventory (NFI)* for modeling forest change. The *Forestry Adaptation Community of Practice (FACoP*) is an online community for sharing information and best practices on climate change vulnerability and adaptation in Canada's forest sector, and the *Forestry Adaptation Working Group,* which is chaired by the the Government of Canada and includes provinces, territories, industry and academia, has the objective to share knowledge and information on climate change adaptation to support resilient forest ecosystems.

Parks and Protected Areas: The Government of Canada is working with partner organizations and specialists to develop tools and approaches to better understand and support climate change adaptation in parks and protected areas in Canada. For example, a series of regional reports was produced, summarizing the evolution of climate conditions at Parks Canada heritage places and the potential impacts that forecasted changes may cause. The Canadian Parks Council Climate Change Working Group, co-chaired by the Government of Canada and Government of Northwest Territories, provides a forum for cross-jurisdictional sharing of tools, information and best practices for mainstreaming climate change decision-making into park and protected area management planning and operations, and promoting the concept of parks and protected areas as natural solutions through new approaches, tools, and communication opportunities.

Coasts: *Argo* is an (international) array of over 4000 free-drifting floats that collect data on ocean temperature and salinity. Argo data are publically available for free and is used for a variety of purposes such as assessing climate change, improving weather forecasts, and developing ocean models. *Oceanographic Activities:* The Government of Canada is supporting the observation of ocean and fresh water physical, chemical and biological conditions (e.g. tides, ocean currents, pH, salinity, temperature, ocean colour, phytoplankton, etc.) to advance understanding of Canada's oceans and waterways and in generating models to assist in responding to emergencies (oil spills) and in evaluating the status of ecosystems. *Aquatic Climate Change Adaptation Program* is monitoring and studying the effects that changing ocean conditions is having on Canada's fisheries, aquatic ecosystems, and coastlines. The *Coastal Management Working Group* aims to advance the understanding of climate change impacts on

coastal ecosystems (and ecosystem services) and the role that these ecosystems can play in long-term coastal resilience.

Wildlife: Canada supports a broad range of biodiversity monitoring programs, and aims to make these data publicly available to support modelling of impacts of climate change (and other stressors) on distribution and abundance of wildlife species. For example:

- The longest running monitoring and research programs are for bird populations, many supported by Environment and Climate Change Canada (ECCC), often in partnership with other organizations such as non-government organizations, provinces and territories, universities and other countries, particularly the United States. Some of the longest running surveys include the North American Breeding Bird Survey (since 1966) and Christmas Bird Count (since 1900), both relying heavily on Citizen Scientists, and the joint U.S. Fish and Wildlife Service / Canadian Wildlife Service breeding waterfowl surveys (since 1955).
- Many other surveys and research programs fill specific geographic and taxonomic gaps, such as shorebird migration surveys, the Canadian Migration Monitoring Network, seabird colony surveys and helicopter-based surveys of Arctic-nesting shorebirds. These data are used for monitoring population status and for understanding drivers of population change, and have been analyzed for hundreds of scientific publications, many relevant to climate change. Many of these data sets are already openly available, and efforts are underway to enhance the tools available for their analysis to support decision making. In addition, the provinces and territories, through their respective Conservation Data Centres and the NatureServe Canada network, maintain databases on current and historic distributions of many other wildlife species, including both plants and animals, with an emphasis on Species at Risk. These data can help to support evaluations of the likely impacts of climate change on Species at Risk.

- In addition to biodiversity monitoring, ECCC implements research programs to develop Earth Observation tools to assess the impacts of climate change on wildlife habitat.

Caribou

Environment and Climate Change Canada is conducting research to better understand the potential impacts of climate change on boreal caribou and the species' ability to adjust and adapt to future environmental changes. For example, ECCC is:

- Building models that examine how caribou respond to future changes in landscape, estimating changes in vegetation communities, human and natural disturbance, and climate condition.
- Simulating effects of climate change on fire regime and implications for boreal caribou and land bird communities in the Northwest Territories
- Organizing a workshop to discuss potential impacts of climate change on caribou at the 17th North American Caribou Workshop, in 2018.

Native bees

Environment and Climate Change Canada (ECCC) recognizes that native bee species are a key component of global biodiversity and provide a critical ecosystem service through pollination of

agricultural crops and wild plant species, including many native wildflower species. Several species are currently recognized as at risk under the Species at Risk Act.

ECCC is undertaking research to assess causes of declines of native bees including how habitat loss and climate change are directly affecting native bee species and their effects on foraging and nesting habitats. Other research is focused on improving Canada's understanding of the vulnerability of native bee species to climate change. Filling in these knowledge gaps will help to identify evidence-based management strategies to address pollinator declines and manage for resilient pollinator communities.

Provinces and Territories – Reports and Assessments

Alberta: *Tree Species Adaptation Risk Management Project: Final Report* describes the project activities and outcomes, and their linkage to provincial forest management policy. In addition, Tree Improvement Alberta has compiled reports to be submitted to the owners of the tree improvement programs to allow them to integrate project results into their future program planning and management.

Alberta: *Climate change and Alberta's forests: an information and discussion paper of predicted implications* examines the impacts of climate change on forests and forest ecosystems, with relevance to Alberta (e.g., Impacts to tree species distributions; ecosystems and biodiversity; wetland areas; growth and productivity; disturbance events; genetics, invasive species).

Northwest Territories: is undertaking climate change vulnerability analyses for all valued species and species at risk to inform better wildlife management decisions; completing vulnerability assessments for aquatic ecosystems and to measure potential impacts from climate change; updated the 2006 NWT Biodiversity Action Plan with a new gap analysis to ensure actions for maintaining biodiversity in light of a changing climate are in place; and manage invasive alien species, which can pose a threat to biodiversity.

Nunavut: *Frobisher Bay Long-Term Ecology and Habitat Mapping Study:* Nunavut Department of Environment is conducting research to examine the impacts of human development and changing climate on seabed habitats in the Arctic.

Nunavut: *Linking Changes in the Arctic Marine Ecosystem to the Provisioning of Ecosystem Services and Inuit Well-Being* study will assess the importance of the services provided by the marine ecosystem to the community; determine how environmental conditions influence the provisioning of Arctic char fisheries; evaluate how climate-induced changes will alter the socio-ecological relationship between the community and the marine ecosystem. This study will combine diverse but complementary methods to study the Arctic marine ecosystem and its interconnectedness with Inuit communities in the context of a changing Arctic.

Provinces and Territories – Plans/Management/Land Use

Plans

British Columbia**:** *Climate Change Strategy 2015 – 2020* outlines how British Columbia's Ministry of Forests, Lands, Natural Resource Operations and Rural Development will integrate climate change

adaptation and mitigation into all ministry program areas, operations, resource management decisions, and actions.

New Brunswick: *Transitioning to a Low-Carbon Economy: New Brunswick's Climate Change Action Plan includes* commitments to: recognize the importance of ecosystems (e.g., wetlands, forests, soil, dunes, coastal salt marshes) in buffering the impacts of climate change, and integrate ecosystem services (e.g., temperature control, maintaining air quality, erosion control, water quality improvement, flood reduction) into land-use planning; and while balancing the economy and the environment, identify and focus on the most climate-vulnerable species, habitats, and landscapes as targets for adaptation action and manage for landscape connectivity to allow for species migration.

Newfoundland and Labrador: *Coastal and Ocean Management Strategy and Policy Framework* is the Government of Newfoundland and Labrador's long-term vision for planning and management, and conservation and sustainable use of the province's coastal and ocean areas and resources including: ensuring that coastal ecosystems, particularly areas of significant ecological importance, are protected, maintained, and restored where possible; and that coastal activities and development do not result in irreversible damage or harm coastal and ocean areas and resources.

Northwest Territories: *Northwest Territories Climate Change Strategic Framework (NWT CCSF)*: Released in Spring 2018, outlines the long-term approach for a strong, healthy economy that is less dependent on fossil fuels, with a focus on improving knowledge of climate change impacts occurring in the Northwest Territories while building resilience and adapting to a changing climate. The next step is to develop an Action Plan to implement the NWT CCSF will incorporate climate change considerations based on the best science, traditional and local knowledge into conservation network planning, and will support the establishment of existing candidate areas and new areas, as per the *Healthy Land, Healthy People: GNWT Priorities for Advancement of Conservation Network Planning 2016-2021.*

Northwest Territories: Indigenous governments are consulted on policy and legislative initiatives related to conservation of biodiversity in the NWT. (e.g., Indigenous governments provided key input to the recently completed Wildlife Act; and Indigenous governments are participating in technical working groups to develop new legislation for the establishment of conserved and protected areas as the designation of areas may impact Indigenous or treaty rights. This is an important collaborative process. Land use plans are noted as an important policy tool to respond to climate change. Climate change considerations can be incorporated into the vision and objectives of a land use plan and built into legally binding conformity requirements, which can help with climate change adaptation on a regional level.

Northwest Territories: *The GNWT Land Use and Sustainability Framework (2014)* climate change adaptation and mitigation is one of the land use and sustainability objectives that will be elaborated upon as the Land Use and Sustainability Framework is implemented.

Ontario: *Ontario's Biodiversity Strategy* includes commitments to report on the State of Ontario's Biodiversity and on progress in achieving *Ontario's 15 Biodiversity Targets* every 5 years. Their reporting site includes indicators that summarize data from monitoring programs to evaluate progress in achieving

each of the 15 Targets and status and trends in three biodiversity theme areas: pressures on biodiversity; state of ecosystem, species and genetic diversity; and, conservation and sustainable use.

Québec : Le gouvernement du Québec travaille actuellement à la mise en place d'un réseau de suivi québécois de la biodiversité en vue de détecter et suivre les changements de l'état de certains écosystèmes, communautés et populations dans le temps, afin d'analyser les tendances dans un contexte de changements climatiques. En vue de mettre en place le réseau de suivi de la biodiversité, une première sélection d'indicateurs a été faite par un comité d'experts (2013-2016). La validation de ces indicateurs est en cours. Un portrait de la biodiversité du Québec est en cours de réalisation. Cette initiative fait partie du *Plan d'action sur les changements climatiques 2013-2020 du Québec*, lequel intègre tous les principes du développement durable.

Decision-Support Tools

Alberta: *Biodiversity Management and Climate Change Adaptation project* provides knowledge and tools to support the management of Alberta's biodiversity in a changing climate (e.g., forecasting shifts in natural subregions; anticipating impacts to Alberta's species and ecosystems; a climate vulnerability assessment of natural species; development of species-specific recovery plans; trialling on the ground management techniques such as assisted migration; recommendations for incorporating information on impacts into decision making; and tools for communities to increase their resilience to climate change impacts).

Alberta: The Climate Change and Emissions Management Corporation has supported projects for climate change impacts throughout the province to enhance Alberta's ability to respond appropriately: the *South Saskatchewan River Basin Adaptation to Climate Variability* project helps communities explore possible impacts of climate variability and identifies opportunities for environmental and economic improvement in water storage, infrastructure, and alternative timing of withdrawals, releases, and flows; the *Tree Species Adaptation Risk Management Project* builds resilience to climate stressors; and the *Biodiversity Management and Climate Change Adaptation Project* estimates impacts on native species and ecosystems, including response of invasive plants to climate change, as well as tools to support sensitive species at risk. Alberta has also been contributing to natural infrastructure measures to enhance resiliency to flood and drought through the *Watershed Resiliency and Restoration Program*. To date, 600 hectares of wetlands and riparian areas have been restored.

British Columbia: Tools for adapting natural resource management so that British Columbia forests and other resources can remain resilient to climate change, variability and other stressors. For example:

- Climate Change Tools – Comprehensive List: an Excel sheet provides a list of known climate change adaptation tools that are relevant for use by BC natural resources professionals, government staff and First Nations.
- Fish & Wildlife: *Climate Change Vulnerability of B.C.'s Fish & Wildlife Species – First Approximation* provides an approach for assessing vulnerability, including a database and ratings for 130 species.
- Forest Health: Stand establishment decision aids (SEDA) are extension notes that synthesize the latest information on silvicultural tools and practice.

- Impact & Vulnerability Assessments: Climate change assessments can assist in identifying risks and opportunities. Includes a guide can help resource managers in B.C. understand different types of assessments as a step toward integrating climate change into business processes.
- NR & CC Applied Science: Scientific research is being undertaken in British Columbia in order to adapt the provincial natural resource sector to a changing climate, reduce carbon emissions and increase carbon sinks. Listed by research topic; topics include vulnerability assessments and planning; natural disturbance impacts and risks; economics and community; water and aquatic ecosystems; baseline data, monitoring and classification; timber supply, forests and range productivity; spatial climate data.
- Climate-Based Seed Transfer: B.C.'s seed transfer system will help ensure that B.C.'s planted forests will be adapted to their climatic environment.

Prince Edward Island: *Prince Edward Island Climate Change Adaptation: Recommendations Report* a study on the impacts of climate change on several sectors including Agriculture, Fish and Aquaculture, Forestry and Biodiversity, and Water.

<u>Municipalities – Plans/Management/Land Use</u>

There is a breadth of initiatives underway in municipalities across Canada to better understand and adapt ecological systems to the impacts of climate change. These range from technical reports to strategic plans. A few demonstrative examples are provided below**.**

Plans

Town of Gibsons: *Towards an Eco-Asset Strategy for the Town of Gibsons*: this report presents promising practices from the community of Gibsons in exploring managing the natural capital in their community (i.e., green space, aquifers, foreshore area and creeks) and the ecosystem services that it provides, at the core of the Town's municipal infrastructure system.

The City of Surrey: released the *Shade Tree Management Plan* in 2016, which outlines how the city's urban forest will remain resilient by increasing species diversity, choosing species and planting stock for future climates, and providing more favourable growth conditions.

The City of Vancouver: *Vancouver Park Board's Biodiversity Strategy* presents a goal, target, objectives, and actions for supporting biodiversity in parks, and on other public and private lands. Together with the *Urban Forest Strategy*, the *Rewilding Action Plan*, and the *Vancouver Bird Strategy*, it provides a foundation for protecting and restoring natural areas, species, and ecological processes, and for improving access to nature.

Decision-Support Tools

ICLEI Canada and the Toronto and Region Conservation: launched a resource on biodiversity, *biodiverCities: A Primer on Nature in Cities*, as a companion document to an urban biodiversity management guidebook, which operationalizes the theme within the Primer and presents practical and action-orientated steps or "milestones" that municipalities can follow as they pursue a biodiversity plan.

The Don Mouth Naturalization and Port Lands Flood Protection Project (DMNP) will transform the existing mouth of the Don River, including the Keating Channel, into a healthier, more naturalized river outlet, while simultaneously providing critical flood protection to 240 hectares of Toronto's eastern waterfront.

Ouranos develops decision-making tools to facilitate adaptation and promote its integration into the conservation of biodiversity, and environmental management and planning; improving knowledge of climate change impacts on biodiversity and assess vulnerabilities of species and communities, habitats and ecosystems; sharing new knowledge about the impacts of climate change and the role of ecosystem services to engage all citizens in adaptation.

The *Municipal Natural Assets Initiative* provides local governments with tools to identify and account for natural assets at the community level, as well as the best practice guidelines to assist governments in saving costs while also delivering services more efficiently and adapting to climate change.

Indicators used in this assessment

1. Completion of assessments of the vulnerability of ecological systems and biodiversity to climate change sectors and regions across Canada that identify priority areas and species of greatest concern.
2. The number and extent of management, land use and development plans completed and implemented that integrate explicit consideration of adaptation to facilitate or enhance resilience and sustainable use of species and areas of greatest concern.

Relevant websites, web links and files

- Pacific Large Aquatic Basin Risk-based Assessment 2013/016: http://www.dfo-mpo.gc.ca/csas-sccs/Publications/ScR-RS/2013/2013_016-eng.html
- Arctic Large Aquatic Basin Risk-based Assessment 2012/042: http://www.dfo-mpo.gc.ca/csas-sccs/Publications/ScR-RS/2012/2012_042-eng.html
- Atlantic Large Aquatic Basin Risk-based Assessment 2012/044: http://www.dfo-mpo.gc.ca/csas-sccs/Publications/ScR-RS/2012/2012_044-eng.html
- Freshwater Large Aquatic Basin Risk-based Assessment 2013/016: http://www.dfo-mpo.gc.ca/csas-sccs/Publications/ScR-RS/2013/2013_011-eng.html
- Canada in a Changing Climate: http://www.nrcan.gc.ca/sites/www.nrcan.gc.ca/files/earthsciences/pdf/assess/2014/pdf/Full-Report_Eng.pdf
- Canada's Marine Coasts in a Changing Climate: http://www.nrcan.gc.ca/environment/resources/publications/impacts-adaptation/reports/assessments/2016/18388
- Pan-Canadian Framework on Clean Growth and Climate Change: https://www.canada.ca/en/services/environment/weather/climatechange/pan-canadian-framework.html
- Indigenous Community-Based Climate Monitoring Program: http://www.aadnc-aandc.gc.ca/eng/1100100034249/1100100034253
- Atlantic Ecosystems Initiative (AEI): https://www.canada.ca/en/environment-climate-change/news/2016/08/the-atlantic-ecosystems-initiatives.html

- The Gulf of Maine Initiative (GMI): https://www.canada.ca/en/environment-climate-change/news/2016/08/the-gulf-of-maine-initiative.html
- Canada's Climate Change Adaptation Platform: https://www.nrcan.gc.ca/environment/impacts-adaptation/adaptation-platform/10027
- Adaptation Platform Working Groups: http://www.nrcan.gc.ca/environment/impacts-adaptation/adaptation-platform/17176
- Drought Watch: http://www.agr.gc.ca/eng/programs-and-services/list-of-programs-and-services/drought-watch/?id=1461263317515
- Agro-climate Projected Scenarios: http://www.agr.gc.ca/eng/science-and-innovation/agricultural-practices/agriculture-and-climate/future-outlook/climate-change-scenarios/?id=1362684401064
- Impact of climate change on Canadian agriculture: http://www.agr.gc.ca/eng/science-and-innovation/agricultural-practices/agriculture-and-climate/future-outlook/impact-of-climate-change-on-canadian-agriculture/?id=1329321987305
- AgriRisk Initiative: https://www.canada.ca/en/news/archive/2015/03/agririsk-initiative-alberta-federation-agriculture.html?_ga=2.58828589.1887162469.1528140400-8364142.1528140400
- Business Risk Management programs: http://www.agr.gc.ca/eng/programs-and-services/agricultural-business-management/business-risk-management-programs/?id=1490812852619
- Forest Change adaptation tools: http://www.nrcan.gc.ca/forests/climate-change/tools-resources/17770
- Forests adaptation Options: http://cfs.nrcan.gc.ca/adaptation-options
- Plant Hardiness Zones: http://planthardiness.gc.ca/
- CCFM Review of Assisted Tree Migration: http://www.ccfm.org/pdf/CCFM Assisted Tree Migration November 2014 English FINAL.pdf
- Canada's National Forest Inventory (NFI): https://nfi.nfis.org/en/
- Forestry Adaptation Community of Practice (FACoP): https://www.ccadaptation.ca/en/facop
- Argo: http://www.dfo-mpo.gc.ca/science/Publications/multimedia/argo/video-eng.html
- Oceanographic Activities: http://www.dfo-mpo.gc.ca/science/oceanography-oceanographie/activities/index-eng.html
- Aquatic Climate Change Adaptation Services Program (ACCASP): http://www.dfo-mpo.gc.ca/science/rp-pr/accasp-psaccma/index-eng.html
- Tree Species Adaptation Risk Management Project: Final Report: https://friresearch.ca/resource/tree-species-adaptation-risk-management-project-final-report
- Climate change and Alberta's forests: https://open.alberta.ca/publications/climate-change-and-alberta-s-forests-an-information-and-discussion-paper-of-predicted-implications
- Frobisher Bay Long-Term Ecology and Habitat Mapping Study: https://climatechangenunavut.ca/en/project/frobisher-bay-long-term-ecology-and-habitat-mapping-study
- Linking Changes in the Arctic Marine Ecosystem to the Provisioning of Ecosystem Services and Inuit Well-Being: https://climatechangenunavut.ca/en/project/linking-changes-arctic-marine-ecosystem-provisioning-ecosystem-services-and-inuit-wellbeing
- FLNR Climate Change Strategy 2015-2020: https://www2.gov.bc.ca/assets/gov/environment/natural-resource-stewardship/nrs-climate-change/climate_change_strat_2015-20.pdf

- Transitioning to a Low-Carbon Economy: New Brunswick's Climate Change Action Plan: http://www2.gnb.ca/content/dam/gnb/Departments/env/pdf/Climate-Climatiques/TransitioningToALowCarbonEconomy.pdf
- Coastal and Ocean Management Strategy and Policy Framework: http://www.fishaq.gov.nl.ca/publications/pdf/CoastalStrategy_2011.pdf
- Northwest Territories Climate Change Strategic Framework (NWT CCSF): http://www.enr.gov.nt.ca/en/services/climate-change/have-your-say-draft-climate-change-strategic-framework
- Healthy Land, Healthy People: http://www.enr.gov.nt.ca/en/services/conservation-network-planning/healthy-land-healthy-people
- The GNWT Land Use and Sustainability Framework (2014): http://www.lands.gov.nt.ca/sites/lands/files/resources/land_use_and_sustainability_framework_updated_email.pdf
- Ontario's Biodiversity Strategy: http://sobr.ca/
- Ontario's Biodiversity Targets: http://sobr.ca/_biosite/wp-content/uploads/OBS_Targets.pdf
- Plan d'action sur les changements climatiques 2013-2020 du Québec: http://www.mddelcc.gouv.qc.ca/changementsclimatiques/plan-action-fonds-vert.asp
- Biodiversity Management and Climate Change Adaptation project: http://www.abmi.ca/home/biodiversity/biodiversity-climate-change.html
- South Saskatchewan River Basin Adaptation to Climate Variability: http://eralberta.ca/projects/details/south-saskatchewan-river-basin-ssrb-adaptation-climate-variability-project/
- Tree Species Adaptation Risk Management Project: http://eralberta.ca/projects/details/tree-species-adaptation-risk-management-project/
- Biodiversity Management and Climate Change Adaptation: http://eralberta.ca/projects/details/biodiversity-management-climate-change-adaptation/
- Watershed Resiliency and Restoration Program: http://aep.alberta.ca/water/programs-and-services/watershed-resiliency-and-restoration-program/default.aspx
- British Columbia Natural Resource Management Tools: https://www2.gov.bc.ca/gov/content/environment/natural-resource-stewardship/natural-resources-climate-change/natural-resources-climate-change-adaptation/tools
- Climate-Based Seed Transfer (CBST) Project: https://www2.gov.bc.ca/gov/content/industry/forestry/managing-our-forest-resources/tree-seed/seed-planning-use/climate-based-seed-transfer/climate-based-seed-transfer-project
- Prince Edward Island Climate Change Adaptation: Recommendations Report: https://www.princeedwardisland.ca/en/information/communities-land-and-environment/climate-change-adaptation-recommendations-report
- Towards an Eco-Asset Strategy for the Town of Gibsons: http://gibsons.ca/wp-content/uploads/2017/12/Eco-Asset-Strategy.pdf
- Shade Tree Management Plan: http://www.surrey.ca/files/Shade Tree Management Plan final.pdf
- Vancouver Park Board's Biodiversity Strategy: http://vancouver.ca/news-calendar/park-board-wants-nature-in-the-city-not-an-urban-jungle.aspx
- Urban Forest Strategy: http://vancouver.ca/home-property-development/urban-forest-strategy.aspx
- Rewilding Action Plan: http://vancouver.ca/files/cov/enviromental-education-stewardship-action-plan.pdf

- Vancouver Bird Strategy: http://vancouver.ca/parks-recreation-culture/vancouver-bird-strategy.aspx
- BiodiverCities: A Primer on Nature in Cities: http://www.icleicanada.org/images/icleicanada/pdfs/biodiverCities_A Primer on Nature in Cities.pdf
- The Don Mouth Naturalization and Port Lands Flood Protection Project (DMNP): https://trca.ca/conservation/green-infrastructure/don-mouth-naturalization-port-lands-flood-protection-project/
- Ouranos: https://www.ouranos.ca/en/program/ecosystems-biodiversity/
- Municipal Natural Assets Initiative: http://institute.smartprosperity.ca/content/municipal-natural-assets-initiative

- Additional supporting evidence and resources can be found in the following linked attachment http://twk.pm/ghjbv74k1u

Level of confidence of the above assessment

☐ Based on comprehensive evidence
☒ Based on partial evidence
☐ Based on limited evidence

Please provide an explanation for the level of confidence indicated above

Evidence was collected broadly and across a multitude of jurisdictions, sectors and fields. For example, evidence was informed by *Canada's 7th National Communication* under the UNFCCC; input collected through the Pan-Canadian Framework on Clean Growth and Climate Change, under which First Ministers directed federal, provincial, and territorial governments to report annually to Canadians and First Ministers on progress achieved, including efforts to advance adaptation across the country; and through targeted discussions with multiple stakeholders responsible for the ecological systems and adaptation. These reporting mechanisms are reflective of the federal, provincial and territorial evidence base and partial at the municipal and local-level. In future, a national monitoring system could assist in informing an in-depth coordinated communication of progress at the local-level that would assist in building the evidence towards achieving the target.

Adequacy of monitoring information to support assessment

☐ Monitoring related to this target is adequate
☒ Monitoring related to this target is partial (e.g. only covering part of the area or issue)
☐ No monitoring system in place
☐ Monitoring is not needed

Please describe how the target is monitored and indicate whether there is a monitoring system in place

Most jurisdictions in Canada are monitoring and tracking progress towards meeting this target. Some reporting on biodiversity and ecosystems is covered through an annual national reporting process under the Pan-Canadian Framework on Clean Growth and Climate Change, however a formalized national monitoring system could assist in monitoring and communicating national progress towards achieving the target.

Relevant websites, web links and files

The following jurisdictions are provided as examples for monitoring systems that are in place to measure progress for adaptation and biodiversity:

- Pan-Canadian Framework on Clean Growth and Climate Change – First annual report : adaptation and climate resilience: https://www.canada.ca/en/services/environment/weather/climatechange/pan-canadian-framework/first-annual-report/adaptation-climate-resilience.html
- Canada's 7th National Communication under the UNFCCC: https://www.canada.ca/en/environment-climate-change/services/climate-change/greenhouse-gas-emissions/seventh-national-communication-third-biennial-report.html
- State of Ontario's Biodiversity: http://sobr.ca/
- Plan d'action sur les changements climatiques 2013-2020 du Québec: http://www.mddelcc.gouv.qc.ca/changementsclimatiques/plan-action-fonds-vert.asp

Progress assessment: Canada Target 6

By 2020, continued progress is made on the sustainable management of Canada's forests

Category of progress towards the implementation of the selected target

☐ On track to exceed target
☒ On track to achieve target
☐ Progress towards target but at an insufficient rate
☐ No significant change
☐ Moving away from target
☐ Unknown

Date the assessment was done

December 20, 2017

Additional information

Sustainable forest management based on scientific research and participatory planning processes, combined with robust legislative and regulatory tools, is fundamental to the protection, restoration and sustainable use of terrestrial ecosystems, including biodiversity. Canada is on track to achieve continued progress towards the sustainable management of Canada's forests. Sustainable forest management practices incorporate disturbance events such as fires and other stand mortality events into forest management plans. The federal government has invested significantly in programs, which lay the groundwork for a greener and more sustainable future for the forest sector, and will continue to support the emergence of transformative technologies. Provinces and territories, which are largely responsible for managing Canada's forests, including harvesting and renewal, are taking ongoing steps to strengthen management practices, policies and regulations, which contribute to biodiversity conservation. Each province and territory sets an annual allowable cut based on the sustainable growth rate of a forest area, while considering economic, social and ecological factors including biodiversity. The federal government and others will continue to provide science-based knowledge to manage the risks and minimize the impact of forest resource development, including through the production of the National Forest Inventory, which incorporates new economic and biophysical information on Canada's forests.

Indicator selection

In the last CBD report, Canada used the Canadian Council of Forest Ministers' criteria and indicators to measure progress towards Target 6. Since the publication of that report, the international community has developed a Global Core Set of Forest Indicators, as well as the Sustainable Development Goals (SDGs), which report on sustainable forest management (SFM) in SDG 15. In light of this, the following nine indicators, which align with internationally agreed criteria and indicators of SFM as well as with other internationally agreed forest reporting requirements, were selected for reporting.

Canada has based its summary assessment of progress toward Target 6 on its national reporting on SFM, as reported in its annual State of Canada's Forests report. The State of Canada's Forests report uses a series of indicators based on the Montréal Process criteria and indicators, and this report provides a more fulsome assessment of SFM in Canada. The Montréal Process criteria and indicators are aligned with The

Canadian Council of Forest Ministers Criteria and Indicators; the Global Forest Resource Assessment; the United Nation's Sustainable Development Goals; and the newly developed Global Core Set of Forest-related Indicators from the Food and Agriculture Organization of the United Nations. This ensures that Canada's assessment is based on an internationally agreed understanding of SFM, that consistent data are used among reporting fora, and that reporting is supported by a well-established data collection and reporting framework. Shrinking forest cover has the potential to reduce biodiversity, affect soil and water quality, and impact wildlife habitat. Canada's overall deforestation rate is expected to decline further over time.

Forest area and forest area change

Sustainable Forest Management is a way of using and caring for forests so as to maintain their environmental, social and economic values over time. Canada has approximately 347 million hectares of forest land, representing roughly 9% of the world's forests. The area of forest within Canada is quite stable, decreasing by less than half a percent since 2011. The small reduction in forest area over the 2011 - 2015 period is attributed to the clearing of forest land for new, non-forest land uses (for example, agriculture, oil and gas extraction, roads, and hydroelectric developments). Although deforestation (the conversion of forest to non-forest land uses due to human activity) is occurring within Canada, the rate of deforestation has declined by 13% since the last reporting period, from 41,600 hectares per year of deforestation in 2011, to 36,000 hectares per year in 2015. A decline in the amount of deforestation indicates that Canada is on track to achieve Target 6. Additionally, the annual rate of deforestation has been decreasing since 1990, and conversion of forest to agricultural land uses has remained, and will likely remain, the largest cause of deforestation in Canada. The level of deforestation is small relative to the overall size of Canada's forests. Afforestation (the conversion of non-forest land to forest through active management) initiatives are underway in many regions of Canada, however, the level of afforestation has been very small relative to the total forest area in the country and is therefore no longer tracked at the national level.

Area under a long-term management plan

Of Canada's total forest area, 226 million hectares are considered to be managed, while the remaining 35% of Canada's forest land is considered unmanaged. There is little human activity and no commercial harvesting within Canada's unmanaged forests. Over 91%, or 206 million hectares, of Canada's managed forests have a long term management plan in place. Trend data are not available at this time, but are expected to be available for the United Nations' Food and Agriculture Organization's next Global Forest Resource Assessment in 2020.

Area certified

The area of forest land in Canada that is covered by an independently verified certification scheme increased by 11% from 2011 to 2016. In 2011, 150,567,044 hectares or 43% of Canada's total forest area, was covered by a certification scheme. In 2016, 167,797,442 hectares, or 48% of Canada's total forest area was covered. In Canada, managed forests account for 65% of the total forest land; 66% of that managed forest land was covered by a certification scheme in 2011, which increased to 74% of managed forest land in 2016. While an increase in the total area certified is considered positive, it is important to note that independently verified forest management certification schemes complement Canada's comprehensive and rigorous forest management laws and regulations. This provides added assurance that

a forest company is operating legally, sustainably, and in compliance with world-recognized standards for SFM. It does not mean that non-certified forests are unsustainably managed.

Area Harvested

The area of forest harvested each year is monitored to ensure that the level of industrial activity in Canada's forests is sustainable over the long term. In 2015, 779,577 hectares of forest were harvested. This represents a 13% increase from the area harvested in 2011. Most of this increase was due to a rise in the area of public land being harvested, although the area of private land harvested also increased. The increase in area harvested since 2011 can largely be attributed to an increase in the demand for forest products as the global economy continues to improve from the 2008 recession. Both steady growth in U.S. housing starts and steady demand for wood products in China affected the area of forest harvested in Canada. Although it has been slowly increasing since 2009, the area harvested remains well below the pre 2008 recession levels, and harvested lands represent less than one-half of one percent of Canada's 347 million hectares of forest land. Provincial laws in Canada ensure that the area of forest harvested each year remains within sustainable limits; these laws help to ensure that Canada is able to continue to make progress towards the sustainable management of its forests.

Volume harvested relative to the sustainable wood supply

Canada's SFM regime ensures that the country's forests remain healthy and continue to provide a steady stream of benefits for Canadians. With strong laws, oversight and management, wood supply in Canada is sustainable. Across Canada, timber is being harvested at rates more than 30% below the wood supply considered to mark the sustainable limit. Between 2011 and 2015, the total harvest volume on all land types (provincial, territorial, federal, and private) averaged just over 149 million cubic meters (m^3) per year, well below the average sustainable wood supply of 226 million m^3 per year. Over this same period, softwood harvest on all land types averaged 124 million m^3 per year, more than 25% below the estimated softwood wood supply of approximately 171 million m^3 per year. Hardwood harvests on all land types averaged 25 million m^3 per year between 2011 and 2015, a harvest that is 55% below the estimated hardwood wood supply of 56 million m^3 for the period of 2011 to 2015. The volume of wood harvested has increased steadily from 2011 to 2015, increasing from 146.1 million m^3 to 154.3 million m^3; despite this, the volume of wood harvested has remained well below the sustainable wood supply level in Canada. In many years, actual harvest levels are well below the wood supply level because of market conditions or business decisions. As the global demand for Canadian forest products increases, the volume of timber harvested can be expected to increase, narrowing the gap between harvest and sustainable wood supply levels. Yet, annual harvest levels are expected to remain below the annual sustainable wood supply, given the robust provincial and territorial regulatory regimes in place. Despite the increase in forest harvesting since 2011, Canada is on track to achieve Target 6 because the harvest levels have remained well below the sustainable limit.

Regeneration

Under provincial law, all areas harvested on provincial Crown lands are required to be successfully regenerated. Standards and regulations for achieving successful regeneration vary by province, but commonly address: species composition; density and distribution; age and height of the regenerating trees; and distribution of various forest types and age classes across the landscape. Successful regeneration of harvest areas ensures that forest lands remain productive for wood fibre and continue to

provide key ecosystem services such as storing carbon, regulating water quality and quantity, and providing wildlife habitat and recreation opportunities. When natural regeneration is insufficient to re-establish a forest, artificial means, such as planting or seeding, are employed to ensure standards and regulations are met.

In 2015, 574 million seedlings were planted on 413,400 hectares of provincial forest lands in Canada. Seeding was used to establish an additional 13,000 hectares. The area of forest land regenerated through both planting and seeding has steadily increased since 2011, and 11% more forested land was planted and seeded in 2015 compared to 2011. Most regeneration activities occur on harvested lands, so regeneration rates are linked to harvest levels. In turn, harvest levels are influenced by market conditions for forest products. The proportion of natural and artificial regeneration is unlikely to deviate from recent trends. Provincial and territorial laws in Canada ensure that harvested lands in Canada are successfully regenerated; these laws help to ensure that Canada is able to continue to make progress towards the sustainable management of its forests.

Proportion of forest area located within a legally established protected area

Approximately 11.5 %, or 23.66 million hectares, of Canada's managed forest lands fall within a legally protected area (as defined by the International Union for Conservation of Nature (IUCN) categories I – IV). This represents 6.8% of Canada's total forest lands. Data on change in protected forest areas is not available yet, however the trend in protected terrestrial area in Canada is positive, which indicates progress towards Target 6.

In addition to these protected and managed forests, approximately 35% of Canada's forests fall into the unmanaged category. Unmanaged areas are a key contributor to forest biodiversity in Canada: these forests have no commercial forestry and are often very remote with little human activity.

Total aboveground biomass stock in forests

Canada's managed forests contained 98 tonnes hectare^{-1} of aboveground biomass in 2010; this is a decline of approximately 1 tonne hectare^{-1} from 2005 levels. Natural losses are the primary cause of biomass loss in Canada, including a mountain pine beetle epidemic of historically unprecedented scale. More recent trend data are not available at this time, but are expected to be available for the United Nations' Food and Agriculture Organization's next Global Forest Resource Assessment in 2020. This data will allow a longer term trend to be evident thus leading to a better assessment of the indicator.

Changes in the above-ground biomass stock in forests indicate the balance between gains in biomass stock due to forest growth and losses due to wood removals, natural losses, fire, wind, insects and diseases. At a country level and over a longer period, SFM would imply a stable or increasing biomass stock per hectare, while a long-term reduction of biomass stock per hectare would imply either unsustainable management of the forests and degradation or unexpected losses due to fire, wind, insects or disease.

Communities and Employment

Canada's forests are rich ecosystems that provide many renewable resources. They offer significant environmental benefits, social and cultural opportunities, and opportunities for sustainable economic

development. Because forests are essential to the well-being of Canada's environment, communities, citizens, and economy, Canadians have a deep commitment to sustainably managing the country's forest resources. The forest sector is an important part of the lives of many Canadians. Close to one-third of Canadians live in or adjacent to forested areas, and the forest sector directly accounts for 20% or more of the economic base for over 170 communities across Canada.

In 2016, total direct employment in the Canadian forest industry accounted for 211,075 jobs; direct employment in the forest industry has remained relatively stable since 2011, with an overall increase in jobs of less than 1% since 2011. Over 70% of Indigenous people in Canada live in or near forests. The forest sector is one of the largest employers of Indigenous people in the country, and according to the 2016 Census, the forest sector employed 11,565 Indigenous people.

The forest industry outperformed the overall Canadian economy in 2016, growing by 2.4% from 2015, while the Canadian economy grew by 1.4%. The forest industry accounted for over 23 billion dollars of nominal GDP in 2016. Real GDP increased by a little over 11% from 2011 to 2016; and has steadily increased for each intervening year. Steady rates of employment and contribution to GDP in the forest industry indicate steady socioeconomic benefits for people and communities, which indicates progress towards Target 6.

Indicators used in this assessment

The indicators used in this report were chosen to reflect Canada's national and international reporting obligations, and to reflect indicators of SFM that have been developed since the last CBD report. Canada's report includes indicators from the Montréal Process (MP), Canadian Council of Forest Ministers (CCFM), The Food and Agriculture Organization of the United Nation's Global Core Set of Forest-related Indicators (GCS), the Food and Agriculture Organization of the United Nations 2015 Global Forest Resource Assessment (GFRA), and the Sustainable Development Goals (SDGs). Note that there is overlap between the indicators from the different fora.

Forest area and forest area change: coincides with MP indicators 1.1.a, 3.b.; CCFM indicator 2.2; GCS indicators 1 and 15; GFRA indicator 1, SDG 15.2.1, sub-indicator 1

Forest area under an independently verified forest management certification scheme: coincides with GSC indicator 10, GFRA indicator 16, and SDG 15.2.1 sub-indicator 5

Proportion of forest area under a long-term forest management plan: coincides with MP indicator 1.1; GCS indicator 9; GFRA indicator 14, SDG 15.2.1 sub-indicator 4

Area harvested: coincides with CCFM indicator 2.3; GFRA indicator 4

Volume harvested relative to the sustainable wood supply: coincides with MP indicators 2.b and 2.d; CCFM indicator 5.3.1; GCS indicator 12

Forest regeneration: coincides with CCFM indicator 2.5; GFRA indicator 2

Proportion of forest area located within legally established protected areas: coincides with MP indicator 1.1.b; CCFM indicator 1.1.2; GCS indicator 2; GFRA indicator 6; SDG indicator 15.2.1 sub-indicator 3

Total aboveground biomass stock in forests: coincides with MP indicator 2.5; GCS indicator 3; GFRA indicator 3; SDG 15.2.1 sub-indicator 2

Communities and employment: coincides with MP indicators 6.3.a, 6.3.c; CCFM indicators 5.1.1, 5.3.5; GCS indicators 5, 16; GFRA indicators 19, 20

Additional information about the criteria and indicators used in this assessment can be found in the linked attachment in the relevant websites, web links, and files titled: *Canada Target 6 Criteria and Indicators Table*

Relevant websites, web links and files

Country data for each indicator can be found in the State of Canada's Forests, Annual reports 2012-2018

- 2018: http://cfs.nrcan.gc.ca/pubwarehouse/pdfs/39336.pdf
- 2017: http://cfs.nrcan.gc.ca/pubwarehouse/pdfs/38871.pdf
- 2016: http://cfs.nrcan.gc.ca/pubwarehouse/pdfs/37265.pdf
- 2015: http://cfs.nrcan.gc.ca/pubwarehouse/pdfs/36553.pdf
- 2014: http://cfs.nrcan.gc.ca/pubwarehouse/pdfs/35713.pdf
- 2013: http://cfs.nrcan.gc.ca/pubwarehouse/pdfs/35191.pdf
- 2012: http://cfs.nrcan.gc.ca/pubwarehouse/pdfs/34055.pdf

Associated graphs for each indicator can be found in The State of Canada's Forests Annual Report, 2017 (SOF 2017) on the pages listed below.

- Volume harvested relative to the sustainable wood supply: page 33, Table: Annual harvest versus supply deemed sustainable for harvest, 2005-2015
- Forest area and forest area change: pages 27, Table: Estimated area (millions of hectares) of forest in Canada; and 28, Table: Estimates area (hectares) of annual deforestation in Canada, by industrial sector, 1990-2015
- Forest regeneration: page 32, Table: Area artificially regenerated and number of seedlings planted on provincial Crown lands in Canada, 2005-2015
- Area harvested: page 31, Table: Forest area harvested on private and Crown lands in Canada, 2005-2015
- Communities and employment: page 45, Table: Forest industry direct employment, 2006-2016; and page 51, Table. Canadian forest industry's GDP, 2006-2016
- Proportion of forest area located within legally established protected areas, page 60, Section. Forest Management

- The following two indicators are not reported in SOF 2017, and their sources are reported below:
- Proportion of forest area under a long-term forest management plan: Questionnaire prepared by the Canadian Forest Service to provincial and territorial governments, as reported in Global Forest Resources Assessment 2015 - Country Report, Canada (2015) Forest Resources Assessment Program Table 14a: Forest plan type.
- Total aboveground biomass stock in forests: The National Forest Carbon Monitoring, Accounting and Reporting System (NFCMARS), as reported in Global Forest Resources Assessment 2015 - Country Report, Canada (2015) Section 3.2.3: Managed Forest Biomass Stocks.

There is no rate of change for the indicator "proportion of forest area under a long-term forest management plan" because 2010 was the first time this indicator was reported on. Data were collected for this indicator through a questionnaire prepared by the Canadian Forest Service to Provincial and Territorial governments; more information on this process can be found in the Global Forest Resources

Assessment 2015 - Country Report, Canada (2015) Forest Resources Assessment Program Table 14a: Forest plan type.

The data for the indicator "total aboveground biomass stock in forests" is based on the latest data for Canada's forests, which is from 2010; data from 2005 is used to indicate a trend in this indicator. The biomass reporting here is for Canada's managed forest area only, consistent with the national greenhouse gas inventory reporting to the United Nations Framework Convention on Climate Change. The latest data are reported in the Global Forest Resources Assessment 2015 - Country Report, Canada (2015); Section 3 of that document - and particularly Section 3.2.1: Data Sources - Additional Comments; and 3.2.3: Original Data, Biomass Stock - provide detailed information on original data, sources and estimation.

The relevant tables and figures for this assessment can be found in the linked attachments below titled: *CanadaTarget6ChartsFR.pdf* and *CanadaTarget6ChartsEN.pdf*.

- Linked attachment: *Canada Target 6 Criteria and Indicators Table* http://twk.pm/jsrb3ecu8d
- Linked attachment: *Canada Target 6 Charts FR* http://twk.pm/mu16znglzr
- Linked attachment: *Canada Target 6 Charts EN* http://twk.pm/shm6oemfxj

Level of confidence of the above assessment

☐ Based on comprehensive evidence
☒ Based on partial evidence
☐ Based on limited evidence

Please provide an explanation for the level of confidence indicated above

The assessment is based on a subset of all criteria and indicators of SFM that Canada reports on. This limits the assessment and dictates that the confidence in the report is based on only partial evidence. For a more comprehensive assessment of SFM, the Montréal Process criteria and indicators, as reported in Canada's Annual State of the Forests Report, should be consulted.

Adequacy of monitoring information to support assessment

☐ Monitoring related to this target is adequate
☒ Monitoring related to this target is partial (e.g. only covering part of the area or issue)
☐ No monitoring system in place
☐ Monitoring is not needed

Please describe how the target is monitored and indicate whether there is a monitoring system in place

Canada monitors its progress on Target 6 through a number of different national databases: The National Forest Inventory (NFI), the National Forestry Database, The National Forest Carbon Monitoring, Accounting and Reporting System (NFCMARS), Canada's National Deforestation Monitoring System (NDMS), and the Conservation Area Reporting and Tracking System (CARTS) mapping database, which is run by the Canadian Council on Ecological Areas.

Canada's National Forest Inventory (NFI) uses a remote sensing survey consisting of 2 x 2 km plots located on a systematic 20 x 20 km national grid, with reduced sampling in remote northern ecozones (40

x 40 km), to monitor Canada's forests. In total, there are 13,158 remote sensing plots. These are monitored using a combination of stereo air photo and very high spatial resolution satellite data, which are manually interpreted by forest inventory professionals. Permanent ground plots are maintained at a randomly selected subset of these plots. NFI remote sensing and field plots were established during 2000-2006 and first re-measurement occurred during 2008-2017. Processing of first re-measurement data is currently in progress. The second re-measurement will commence in 2018.

The principal role of the National Forestry Database (NFD) is to collect and compile national forest data and forest management statistics. The NFD serves as Canada's credible, accurate, and reliable source of national information on forest management and its impact on the forest resource. Mandated through the Canadian Council of Forest Ministers (CCFM) - a partnership composed of fourteen federal, provincial and territorial ministers - the Government of Canada and updates and maintains the NFD database and has responsibility for disseminating national forestry statistics. With the guiding support of CCFM members, the CFS collects data from provincial or territorial resource management organizations. Federal land data are provided by the responsible federal departments and compiled by the CFS.

Aboveground biomass data (tonnes) are for the "managed forest" only, which are a 2.3 million km^2 subset of the 3.5 million km^2 total forest area in Canada, as reported in the 2015 Global Forest Resource Assessment. Aboveground biomass data are from the National Forest Carbon Monitoring, Accounting and Reporting System (NFCMARS), as reported in the 2015 Global Forest Resource Assessment. NFCMARS information is from the version used by Canada for the 2013 national GHG inventory report to the UNFCCC (Environment Canada, 2013).

Canada's National Deforestation Monitoring System (NDMS) uses deforestation mapped in sample areas across the country to produce information about the amount of deforestation and where, when and why it occurred. Unlike other satellite-based monitoring systems, the NDMS distinguishes deforestation from other forest cover losses across the country. Specialized analysts locate and map individual deforestation events using satellite imagery, as well as additional information such as high resolution imagery, forest inventory, and industrial databases. Mapping may also use records-based information and expert knowledge.

Canada's system of protected areas includes parks and reserves established by federal, provincial, territorial, municipal and Indigenous governments. The Canadian Council of Ecological Areas maintains a national Conservation Areas Reporting and Tracking System (CARTS), which provides tracking and reporting on the status of Canada's protected areas in a consistent, standardized and reliable manner. CARTS reports and datasets (including GIS files) are available online. Forest protection status is assessed using CARTS in combination with data from Canada's National Forest Inventory.

Canada uses a variety of data sources to report on social and economic aspects of forests and forestry. As Canada's central statistical office (and member of the United Nations Statistical Commission), Statistics Canada produces most of Canada's key socio-economic statistics, including trends on employment, exports, imports, wages and salaries, and forestry's contribution to Canada's gross domestic product. A census, conducted every five years, is a rich resource of information about how the forest industry influences community well-being.

Data for Indigenous employment in forestry is based on Canada Census 2016. Additional information on exact definitions can be found at Statistics Canada.

Relevant websites, web links and files

- The National Forest Inventory: https://nfi.nfis.org/en
- The National Forestry Database: http://nfdp.ccfm.org
- The Conservation Area Reporting and Tracking System: http://www.ccea.org/carts/
- Natural Resources Canada: https://www.nrcan.gc.ca/forests/resources/13507
- The national forest carbon monitoring, accounting and reporting system: http://www.nrcan.gc.ca/forests/climate-change/carbon-accounting/13087
- Statistics Canada Dictionary, Census of Population: http://www12.statcan.gc.ca/census-recensement/2016/ref/dict/az1-eng.cfm

Progress assessment: Canada Target 7

By 2020, agricultural working landscapes provide a stable or improved level of biodiversity and habitat capacity.

Category of progress towards the implementation of the selected target

☐ On track to exceed target
☒ On track to achieve target
☐ Progress towards target but at an insufficient rate
☐ No significant change
☐ Moving away from target
☐ Unknown

Date the assessment was done

August 21, 2017

Additional information

This target highlights the importance of the agriculture working landscape for biodiversity and the role of farmers as stewards of their land.

Measuring progress: Wildlife Habitat Capacity on Agricultural Land

The Wildlife Habitat Capacity (WHC) on Farmland Indicator provides a multi-species assessment of broad-scale trends in the capacity of the Canadian agricultural landscape to provide suitable habitat for populations of terrestrial vertebrates. Consistent with the wording of the target, the main objective for this indicator is for the majority of agricultural working landscapes to provide a stable or improved level of habitat capacity, thus avoiding further significant habitat degradation – and improvements where possible.

Agriculture and Agri-Food Canada has undertaken significant steps to better assess the relationship between agriculture and wildlife habitat availability on farmland in Canada. Specifically, AAFC is developing a national, earth observation based agri-environmental indicator (AEI) to determine potential habitat availability for terrestrial vertebrates. This AEI utilizes yearly earth observation (AAFC Annual Crop Inventory, 30 meter resolution) for quicker reporting turnover as compared to the Canadian Census of Agriculture, which occurs every 5 years. This allows better tracking of land cover (habitat) change and its potential impact on wildlife at the species, guild or multi-species level.

Between 2011 and 2017 potential wildlife habitat capacity (WHC) has remained stable on the 93.74% of the Canadian agricultural landscape with increases on 3.43% and decreases on 3.08%. In the western Prairies, increased WHC was generally associated with shifts in crop type from less to more favourable for wildlife (Cereals to Grassland/Pasture/Hayland). In the eastern Prairies, decreased WHC resulted from a decline in Grassland/Pasture/Hayland and an increase in Annual Crops (Soybean, Cereal, Oilseeds). Declining WHC in the eastern Mixed Wood Plains was related to several factors including and expanding urban footprint, the loss of Grassland/Pasture/Hayland and agricultural expansion resulting in the loss of Shrubland/Woodland. WHC decline in the western Atlantic Maritimes was associated with a slight decline in species-rich Shrubland/Woodland.

Measuring progress: Proportion of Farms with an Environmental Farm Plan

Analysis has shown that education, outreach, and extension, combined with some financial support, are generally the most effective and efficient ways to achieve desired environmental outcomes. Environmental farm planning is a voluntary, confidential self-assessment tool or process, which is designed to help farmers enhance their environmental management by increasing their knowledge and awareness of agri-environmental risks and benefits. This is accomplished through interactions with support personnel (e.g. EFP facilitator or coordinator and EFP workshop) and technical experts (e.g. provincial agricultural staff, agrologists and agricultural engineers), as well as support materials (e.g. EFP workbooks, reference manuals and factsheets). Producers use the knowledge they acquire to identify the agri-environmental risks and benefits associated with their farming operations. The culmination of this process is the creation of an EFP, which includes a list of on-farm agri-environmental risks and an action plan detailing the beneficial management practices (BMPs) required to mitigate those risks. A completed EFP is generally a requirement for obtaining federal/provincial cost-shared funding to implement eligible BMPs aimed at reducing on-farm agri-environmental risks.

As of 2018, the most recent national survey (the Farm Environmental Management Survey) looking at the proportion of farms in Canada with an EFP was conducted in 2011. The results, reported in Canada's 5th national report to the CBD, showed that 35% of farms in Canada had a formal written EFP, which accounts for 50% of the agricultural land area and represents a 7% increase in the number of farms with formal EFPs since 2006. In addition, 2% of farms were in the process of developing an environmental farm plan. Of the farms with an EFP, the majority (95%) had either fully or partially implemented the practices recommended in their EFP.

National survey data on the proportion of farms with an EFP was collected in 2018, however data analysis was not completed in time for inclusion in this report.

Indicators used in this assessment

1. Wildlife habitat capacity on farmland
2. Environmental farm planning on agricultural land

Relevant websites, web links and files

- Farm Environmental Management Survey: https://www150.statcan.gc.ca/n1/daily-quotidien/131009/dq131009a-eng.htm
- Canadian Environmental Sustainability Indicator, Wildlife habitat capacity on agricultural land: https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/wildlife-habitat-capacity-agricultural-land.html

Level of confidence of the above assessment

☐ Based on comprehensive evidence
☒ Based on partial evidence
☐ Based on limited evidence

Please provide an explanation for the level of confidence indicated above

The indicators used to assess progress on this target (WHC and EFP) examine the capacity of the agricultural land to support biodiversity and the uptake of an initiative to increase awareness of actions that can benefit on-farm biodiversity capacity. Both are national in scope with known representativeness. However certain limitations associated with the WHC warrant the assessment above. Namely:

- WHC does not directly assess population status
- Grouping of some land cover types makes the indicator a more conservative estimate (see 'Obstacles and scientific and technical needs related to the measure taken' in Section II)
- WHC is not currently anchored to agri-environmental or biological thresholds – for example, how much habitat is sufficient to support sustainable populations

Adequacy of monitoring information to support assessment

☐ Monitoring related to this target is adequate
☒ Monitoring related to this target is partial (e.g. only covering part of the area or issue)
☐ No monitoring system in place
☐ Monitoring is not needed

Please describe how the target is monitored and indicate whether there is a monitoring system in place

The main source of data for Environmental Farm Planning on agricultural land is derived from the *Farm Environmental Management Survey* (and the *Farm Management Survey* from 2018). This is collected by the Canadian federal government's central statistical office, Statistics Canada on a five year cycle.

The main source of data for the Wildlife Habitat Capacity on farmland is the Annual Cropland Indicator on land cover data as found on the Government of Canada's *Open Data* portal. This is land cover data based on satellite observations. Full details of these data sources are available in the relevant websites, web links, and files for more information.

Relevant websites, web links and files

- Farm Environmental Management Survey: https://www150.statcan.gc.ca/n1/daily-quotidien/131009/dq131009a-eng.htm
- Agriculture and Agri-Food Canada Annual Cropland Inventory Earth Observation data: (https://open.canada.ca/data/en/dataset/ba2645d5-4458-414d-b196-6303ac06c1c9

Progress assessment: Canada Target 8

By 2020, all aquaculture in Canada is managed under a science-based regime that promotes the sustainable use of aquatic resources (including marine, freshwater and land based) in ways that conserve biodiversity.

Category of progress towards the implementation of the selected target

☐ On track to exceed target
☒ On track to achieve target
☐ Progress towards target but at an insufficient rate
☐ No significant change
☐ Moving away from target
☐ Unknown

Date the assessment was done

December 29, 2017

Additional information

Canada's approach to moving towards a science-based aquaculture regime by 2020 consists of establishing a regulatory framework that is supported by the best available science advice. With this in mind, in 2013 Canada renewed the Sustainable Aquaculture Program, continuing the commitment by allocating $54 million over five years for ongoing regulatory reforms and aquaculture science research. Of this new investment, 60% was provided to aquaculture science to produce new knowledge and science advice to help inform management decisions. In 2018, Canada is renewing the funding again at $22 million over two years in order to continue its progress towards a science-based Aquaculture Management regime by 2020.

With the investment in 2013, scientific research was conducted under the Program for Aquaculture Regulatory Research (PARR) to support aquaculture regulatory decision-making in the areas of fish health, the interactions between wild and farmed fish, the release of organic matter and cumulative effects of aquaculture on the environment. For example, to respond to concerns about the impact of aquaculture on the abundance and diversity of wild Fraser River Sockeye Salmon in the southwest of the province of British Columbia, a series of risk assessments has been planned to determine specific risks to this wild population from a known pathogen including one undertaken to determine the risk from the transfer of infectious hematopoietic necrosis virus. The assessment has revealed that the impact is minimal, and the finding will be integrated into the management decision regarding aquaculture operations in that region. Each risk assessment and scientific analysis generated through the process is peer reviewed through Canadian Science Advisory Secretariat of Canada's Department of Fisheries and Oceans. Another example is the science advice provided on the shellfish production capacity in Prince Edward Island that has informed decision-making for lease applications. These two examples show some of the range of ways that scientific information and advice is used for regulatory decision making.

Science advice was also used in developing the first national regulations for aquaculture. Known as the *Aquaculture Activities Regulations* (AAR), these regulations under the federal *Fisheries Act* contain provisions that support pollution prevention and are intended to minimize incidental harm to fish and fish

habitat from aquaculture activities. Based on science advice, a monitoring standard has been developed to guide aquaculture operators to comply with the regulations in managing drugs, pesticides and pollutant organic material (biochemical oxygen-demanding matter). In order to make the standard adaptive to changes of technology and environmental conditions, a three-year science review is planned. Once the peer reviewed scientific analysis becomes available, Canada will use the information to inform changes to the regulations and monitoring standard.

Canada has also funded regulatory science research projects under the Program for Aquaculture Regulatory Research. Priorities for these projects are developed after aligning management questions with scientific knowledge gaps and are destined to support more scientifically-based regulatory and policy decisions. To date, the priority research areas in which projects have been funded include fish pest and pathogen management and treatment; interactions between farmed and wild fish; release of organic matter; and cumulative environmental effects and ecosystems management.

The regulations and standards developed for aquaculture are enforced mainly through aquaculture license conditions. An operator is required to implement farm management plans that include, among other things, management of diseases and parasites, the prevention of farmed fish escapes into the environment, environmental monitoring, and the deposit of deleterious substance into fish bearing waters. Compliance data generated by the Canada's Compliance and Enforcement team for fisheries and aquaculture indicates an increase in compliance rate from 98% in 2011-16 to 100% in 2017-18 (see relevant links for more information). Although an indirect measure, this high compliance rate with regulations over the years does demonstrate a discernible progress towards the target. Many of these conditions are also monitored under separate provincial regulations (see relevant links for more information).

Canada's commitment to promoting the sustainable use of aquatic resources and biodiversity conservation is also maintained through the *National Code on Introductions and Transfers* (2017). The Code is used to regulate intentional movement of live aquatic organisms (i.e. fish, shellfish and plants) from one waterbody to another, including aquaculture facilities, to minimize the potential ecological, disease and genetic risks associated with the intentional movement. The foundation of the Code remains the utilization of science-based, objective risk assessment frameworks. The risk assessment process of the Code enables to minimize the risks of unintentionally spreading diseases or pests, altering the genetic makeup of native species, or otherwise negatively impacting surrounding ecosystems. The use of this Code conforms with the Strategic Directions for aquatic areas, as outlined in the Canadian Biodiversity Strategy, that commits to reducing "to acceptable levels, or eliminate, adverse impacts of species introductions on aquatic biodiversity from aquaculture projects…".

An inherent challenge involved in translating scientific knowledge into management action relates to the long-term processes required for completing aquaculture research and scientific peer-review before it can be incorporated into regulatory or legislative changes.

Indicators used in this assessment

1. The extent to which aquaculture is managed under a science-based environmental regulatory framework. The specific metric used for this indicator is the percentage of compliance with federal aquaculture regulations.

Please describe any other tools or means used for assessing progress

A committee called the Strategic Management Committee led by the Canadian Council of Fisheries and Aquaculture Ministers meets quarterly to discuss the issues of national interest related to aquaculture management and science.

Relevant websites, web links and files

- Canadian Environmental and Sustainability Indicators: https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/management-canadian-aquaculture.html
- Provincial and Territorial Acts and Regulations: http://www.dfo-mpo.gc.ca/aquaculture/management-gestion/regs-eng.htm
- Regulating and monitoring British Columbia's marine finfish aquaculture facilities 2015–2016: http://www.dfo-mpo.gc.ca/aquaculture/management-gestion/mar-rep-rap-2015-2016/index-eng.html
- Aquaculture - Environmental management and reporting: http://www.dfo-mpo.gc.ca/aquaculture/environment-environnement-eng.html
- National Code on Introductions and Transfers of Aquatic Organisms: http://www.dfo-mpo.gc.ca/aquaculture/management-gestion/it-code-eng.htm#foreword
- Program for Aquaculture Regulatory Research: http://www.dfo-mpo.gc.ca/aquaculture/parr-prra/index-eng.html
- Canadian Council of Fisheries and Aquaculture Ministers Aquaculture Development Strategy 2016-2019: http://www.dfo-mpo.gc.ca/aquaculture/collaboration/ccfam-eng.html

Level of confidence of the above assessment

☒ Based on comprehensive evidence
☐ Based on partial evidence
☐ Based on limited evidence

Please provide an explanation for the level of confidence indicated above

Over the past years, Canada's regulatory approach has become more streamlined and this process of streamlining has increasingly incorporated science inputs. This process suggests that aquaculture management is evolving to deepen and expand its science-based regulatory framework. The introduction of national regulations to prevent pollution and harm to fish habitat, science initiatives to update the regulations' monitoring standards, and the use of a science-based risk assessment of introductions and transfers to prevent unintentional alteration of genetic make-up of native species, all provide favourable evidence to support the assessment that Canada is on track to achieve the target. In addition, a number of targeted science projects are expected to be completed and will produce new knowledge before 2020 about the impact of aquaculture on the ecosystem. This new knowledge is expected to help further improve many existing management practices and standards, reinforcing the science orientation of the management regime.

Adequacy of monitoring information to support assessment

☒ Monitoring related to this target is adequate
☐ Monitoring related to this target is partial (e.g. only covering part of the area or issue)
☐ No monitoring system in place
☐ Monitoring is not needed

Please describe how the target is monitored and indicate whether there is a monitoring system in place

The data that were used for assessing the target include the percentage of compliance with aquaculture regulations under Section 35 and 36 of the *Fisheries Act*. Federal fishery officers assess compliance for all national and regional regulations under the *Fisheries Act* that apply to aquaculture, including the *Aquaculture Activities Regulations,* and in British Columbia, the *Pacific Aquaculture Regulations.* Fishery officers conduct inspections to validate license reporting, and to determine whether there is compliance with aquaculture licenses, conditions of license, and other applicable legislation. When necessary, fishery officers respond to complaints and conduct investigations.A compliance report is generated every quarter based on the compliance data maintained in Canada's violation database. Ensuring that aquaculture operators meet environmental protection standards helps to protect Canada's aquatic environment and keep marine resources productive and available for the benefit of future generations.

Progress assessment: Canada Target 9

By 2020, all fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem-based approaches.

Category of progress towards the implementation of the selected target

☐ On track to exceed target
☐ On track to achieve target
☒ Progress towards target but at an insufficient rate
☐ No significant change
☐ Moving away from target
☐ Unknown

Date the assessment was done

November 20, 2017

Additional information

Canada has two indicators to track progress to achieve the target: the status of major fish stocks and the status of sustainable fish harvest, which reports whether the annual harvests of the major fish stocks are considered sustainable (see relevant links for more information). Much of the information on the status of the major stocks comes from Stock Assessment Reports and Research Documents which are peer reviewed. The two indicators provide evidence that for the major fish stocks Canada is generally on track to achieve the target. In addition to these two indicators, Canada has made considerable progress recently in implementing area-based measures to protect and conserve sensitive benthic areas from bottom-contact fishing gear.

However, there has been slower progress to achieve other aspects of the target. While catch data are generally comprehensive for target stocks and sound evidence exists to report on the sustainability of annual harvest levels on these stocks, information on the fishing-related mortality to bycatch species is not comprehensive and thus the full risk to these species from fisheries may not be well understood in some cases. Further, the Sustainable Fisheries Framework policies focus primarily on managing risks at the single fishery level and not on managing risks from all fisheries and stocks within a defined ecosystem-area. To date, Canada has not articulated a methodology to manage fisheries and stocks within an ecosystem area context. A related gap is that a consistent method has yet to be developed to take account of the role of forage species in an ecosystem when setting the allowable catch on a forage fish population.

Indicators used in this assessment

1. Status of major fish stocks
2. Sustainable fish harvest

Please describe any other tools or means used for assessing progress

The primary source of evidence for the assessment is the annual Sustainability Survey for Fisheries. The survey collects information on the status of the major stocks, whether their harvests are considered sustainable and the progress to apply the Precautionary Approach Policy and progress to apply the

Bycatch Policy to manage bycatch in the fisheries on these major stocks. The information provided in the survey is sourced from Stock Assessment Reports and Research Documents published by the Canadian Science Advisory Secretariat and Integrated Fisheries Management Plans.

Relevant websites, web links and files

- Sustainability Survey for Fisheries: http://www.dfo-mpo.gc.ca/reports-rapports/regs/sff-cpd/survey-sondage/index-en.html
- CESI indicators for Sustainable Fish Harvest: https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/sustainable-fish-harvest.html
- CESI indicators for Status of Major Fish Stocks: https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/status-major-fish-stocks.html
- Sustainable Fisheries Framework suite of policies: http://www.dfo-mpo.gc.ca/reports-rapports/regs/sff-cpd/overview-cadre-eng.htm
- Stock Assessment Reports and Research Documents published by CSAS: http://www.isdm-gdsi.gc.ca/csas-sccs/applications/Publications/index-eng.asp
- Integrated Fisheries Management Plans: http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/ifmp-gmp/index-eng.htm

Level of confidence of the above assessment

☒ Based on comprehensive evidence
☐ Based on partial evidence
☐ Based on limited evidence

Please provide an explanation for the level of confidence indicated above

The assessment is based on comprehensive evidence. Since 2010, Canada has been tracking on an annual basis the status of its major fish stocks and whether the harvests on those stocks are considered sustainable. Since 2014, the survey has tracked progress to apply Canada's Bycatch policy. In 2016, the survey assessed progress to apply Canada policy on forage species. In addition, Canada has completed a survey of the catch reporting and monitoring tools used in all its major fisheries.

Adequacy of monitoring information to support assessment

☐ Monitoring related to this target is adequate
☒ Monitoring related to this target is partial (e.g. only covering part of the area or issue)
☐ No monitoring system in place
☐ Monitoring is not needed

Information on how the target is monitored and whether there is a monitoring system in place

Two indicators are used to track progress to achieve the target: the status of major fish stocks and the status of sustainable fish harvest, which reports whether the annual harvests of the major fish stocks are considered sustainable (see relevant links for more information). Much of the information on the status of the major stocks comes from Stock Assessment Reports and Research Documents which are peer reviewed. The two indicators provide evidence that Canada is generally on track to achieve the target. Currently the two indicators track results for 170 major fish stocks. The annual survey includes a process to validate the results.

Monitoring related to this target is considered partial for the following reasons:

1. The two indicators report on 170 of the major fish stocks, primarily marine, managed by Canada. These are all major stocks, or stocks that are intercepted as bycatch.
2. There is a lack of data on the total fishing mortality on some bycatch species intercepted in multiple fisheries.
3. The indicators do not report on the application of an ecosystem approach to managing fisheries, for example, accounting for the food needs of predators when setting fishery harvest levels for forage fish species.
4. Canada has made substantial progress in recent years to manage fishery impacts on sensitive benthic habitat areas through fisheries area closures, many of which have been identified as other effective area-based conservation measures contributing to Canada Target 1/Aichi Target 11, however fisheries area closures are not included as an indicator under Canada's Target 9.
5. The indicators do not report on the harvest of marine plants although there are limited harvests in Canada.

Relevant websites, web links and files

- Sustainability Survey for Fisheries: http://www.dfo-mpo.gc.ca/reports-rapports/regs/sff-cpd/survey-sondage/index-en.html
- CESI indicators for Sustainable Fish Harvest: https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/sustainable-fish-harvest.html
- CESI indicators for Status of Major Fish Stocks: https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/status-major-fish-stocks.html
- Sustainable Fisheries Framework suite of policies: http://www.dfo-mpo.gc.ca/reports-rapports/regs/sff-cpd/overview-cadre-eng.htm
- Stock Assessment Reports and Research Documents published by CSAS: http://www.isdm-gdsi.gc.ca/csas-sccs/applications/Publications/index-eng.asp

Progress assessment: Canada Target 10

By 2020, pollution levels in Canadian waters, including pollution from excess nutrients, are reduced or maintained at levels that support healthy aquatic ecosystems.

Category of progress towards the implementation of the selected target

☐ On track to exceed target
☐ On track to achieve target
☒ Progress towards target but at an insufficient rate
☐ No significant change
☐ Moving away from target
☐ Unknown

Date the assessment was done

January 5, 2018

Additional information

Canada is making progress on this target, but at an insufficient rate. A summary of status of water quality using a variety of indicators follows, and is supported by an accompanying table. The principle indicators including the national water quality indicator reflect limited progress. Considering all of the indicators together, there are more showing improvement than deterioration but most cases show no change.

For the analysis of change in the national freshwater quality indicator through time, 82% of sites are within fair-good-excellent categories. Change in freshwater quality was detected for few sites, with nearly equal numbers of sites improving and decreasing in quality. A similar outcome is seen when looking at this indicator from a regional perspective as there are mixed results for phosphorus levels in the Great Lakes: Lake Erie levels are too high but decreasing; Lake Superior levels are good and stable; in Lake Huron, Lake Ontario and Georgian Bay phosphorus levels are too low and depleting. The detected change in both directions is for a long time period (1972 to 2013) and no trends can be detected from 2010 to 2013. Phosphorous and nitrogen levels in the St. Lawrence River were mostly too high during the 2012-2014 period. One improving trend is detected but most stations show no change. A number of other indicators for different substances and regional assessments were examined. Most are rated as either poor or fair with no change and some showing improvement. Deterioration was only evident for the agri-environmental performance indices for water quality although the status is generally good. See appended Table, *Nutrients in the St. Lawrence River*, for specific nutrient source assessments.

Indicators used in this assessment

1. Phosphorus levels in the Great Lakes
2. Phosphorous levels in the St. Lawrence River
3. Regional freshwater quality in Canadian rivers
4. Change in the national freshwater quality indicator through time.

These indicators are reported regularly as part of the Canadian Environmental Sustainability Indicators (CESI). Other indicators in CESI related to water were also consulted.

Please describe any other tools or means used for assessing progress

The Canadian Aquatic Biomonitoring Network (CABIN) preliminary results were considered as context. Regional reports on water were consulted, including *State of the Great Lakes 2017*, *Overview of the State of the St. Lawrence*, *State of Lake Winnipeg* report, *Health of the Salish Sea Ecosystem* report, *Gulf of Maine Ecosystem Indicators*, as was the World Wildlife Fund Canada - Watershed reports: *A national assessment of Canada's freshwater.*

Relevant websites, web links and files

- Phosphorus levels in the offshore waters of the Great Lakes (updated May 2017): https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/phosphorus-levels-off-shore-great-lakes.html
- Nutrients in the St. Lawrence River (updated September 2016): https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/nutrients-st-lawrence-river.html
- Water quality in Canadian rivers (pre-release January 2018): https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/water-quality-canadian-rivers.html
- Polybrominated diphenyl ethers (PBDEs) in fish and sediment (updated January 2015): https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/polybrominated-diphenyl-ethers-fish-sediment.html
- Perfluorooctane sulfonate (PFOS) in fish and water (updated November 2016): https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/perfluorooctane-sulfonate-fish-water.html
- Nutrients in Lake Winnipeg (updated November 2016): https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/nutrients-in-lake-winnipeg.html
- Household use of chemical pesticides and fertilizers (updated October 2017): https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/household-use-chemical-pesticides-fertilizers.html
- Risk to soil and water quality from agriculture (updated August 2016): https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/risk-soil-water-quality-agriculture.html
- Releases of harmful substances to water (updated October 2017): https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/releases-harmful-substances-water.html
- Restoring the Great Lakes Areas of Concern (updated October 2017): https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/restoring-great-lakes-areas-concern.html
- Canadian Aquatic Biomonitoring Network (CABIN): https://www.canada.ca/en/environment-climate-change/services/canadian-aquatic-biomonitoring-network.html
- State of the Great Lakes 2017: https://binational.net/2017/06/19/sogl-edgl-2017/
- Overview of the State of the St. Lawrence: http://planstlaurent.qc.ca/en/state_monitoring/overview_of_the_state_of_the_st_lawrence_2014.html

- State of Lake Winnipeg Report: http://gov.mb.ca/waterstewardship/water_quality/state_lk_winnipeg_report/index.html
- Health of the Salish Sea Ecosystem Report: https://www.epa.gov/salish-sea
- Gulf of Maine Ecosystem Indicators: http://www.gulfofmaine.org/2/esip-homepage/
- World Wildlife Fund Canada - Watershed Reports: A national assessment of Canada's freshwater: http://watershedreports.wwf.ca/

Level of confidence of the above assessment

☐ Based on comprehensive evidence
☒ Based on partial evidence
☐ Based on limited evidence

Please provide an explanation for the level of confidence indicated above

While the evidence regarding trends in water quality is characterised as partial, one should consider that the amount of information is relatively good given that Canada is a very large yet sparsely populated country. There are limitations and the need for improvements and innovations to manage the assessment challenges mentioned above is evident. For example the tracking of PBDE in fish involves limited sampling and challenging logistics such that sampling locations within a given drainage region can change from one year to the next. This can be managed by grouping multiple years of samples but change detection is slow. Data from CABIN is still not comprehensive across the country. The impact of hydrology (water quantity and flow) is also an issue on interpreting water quality at certain locations, and the influence of climate change on the water regime will need to be accounted for in the future.

There are some difficult challenges in making the assessment of the target.

1. It is difficult to define pollution "levels that support healthy aquatic ecosystems." Despite this challenge, Canada has made significant headway by developing and using the Water Quality Index and Water Quality Guidelines that allow the incorporation of expert knowledge and site-specific context in determining threshold levels. This is the basis for the water quality in Canadian rivers indicator.
2. Not all types of water pollution are adequately assessed. Many newer harmful substances can enter waters and accumulate in wildlife tissue. Data collection is still very resource intensive and comprehensive data are difficult to maintain. The more recent research and study of micro-plastic pollution in water, for example, is not yet comprehensive. The multi-jurisdictional governance context over water resource management in Canada also requires strong coordination to harmonize methods, optimize monitoring networks, and ensure comparability of data.
3. Regional and local variation within such a large area as Canada can lead to overgeneralized results that mask important differences. Improvements are evident in some places but deterioration is detected in other places. An assumption is made that if there are more instances of improvement compared to deterioration the overall assessment is a weak positive.
4. There is uncertainty over synergistic effects of multiple harmful substances. There is also uncertainty over emerging issues such as nanoparticles, micro-plastics, certain pesticides, pharmaceuticals, etc.

Adequacy of monitoring information to support assessment

☐ Monitoring related to this target is adequate
☒ Monitoring related to this target is partial (e.g. only covering part of the area or issue)
☐ No monitoring system in place
☐ Monitoring is not needed

Please describe how the target is monitored and indicate whether there is a monitoring system in place

Environmental monitoring programs support the indicators used for the assessment. One-time or periodic studies are also referenced in support of the assessment. There are multiple environmental monitoring systems and monitoring for water quality is relatively good for a large country that is sparsely populated, thanks to long-standing federal networks and reliable partnerships with Provincial and Territorial water authorities. However, there are some gaps in environmental monitoring and improvements and innovations are needed to establish a full picture. In some cases, it is a matter of continued monitoring to collect a sufficiently long time series to allow for a more sensitive determination of trends, in others, a matter of harmonizing sampling and analytical methods and data interpretation from one monitoring program to another.

Relevant websites, web links and files

- Environment and Climate Change Canada – Water Monitoring and Surveillance: https://www.canada.ca/en/environment-climate-change/services/freshwater-quality-monitoring/overview.html
- Great Lakes Surveillance Program: http://ec.gc.ca/scitech/default.asp?lang=en&n=3F61CB56-
- State of the St. Lawrence Monitoring Program: http://planstlaurent.qc.ca/en/home/about_us/background/st_lawrence_action_plan_2011_2016/five_year_report_2011_2016/state_of_the_st_lawrence_monitoring_program.html
- CMP Environmental Monitoring and Surveillance Program: https://www.canada.ca/en/environment-climate-change/services/science-technology/programs/monitoring-surveillance-chemicals-management.html#toc3
- Water Quality Index: https://www.ccme.ca/en/resources/water/water_quality.html
- Water quality in Canadian rivers: https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/water-quality-canadian-rivers.html
- Linked attachment: Table: Target 10 Nutrient Assessment: http://twk.pm/bhbrfbgr1x

Progress assessment: Canada Target 11

By 2020, pathways of invasive alien species introductions are identified, and risk-based intervention or management plans are in place for priority pathways and species.

Category of progress towards the implementation of the selected target

☐ On track to exceed target
☒ On track to achieve target
☐ Progress towards target but at an insufficient rate
☐ No significant change
☐ Moving away from target
☐ Unknown

Date the assessment was done

March 8, 2018

Additional information

National initiatives

Pathways for invasive alien species introductions (IAS) in Canada are generally well understood. Many pathways are regulated and/or are partially regulated, including aquaculture, packing/packaging materials, invasive plants, agriculture, crops, horticulture, plant products, and forestry and forest products. Risk assessments and management plans have been completed for high-risk pathways including ballast water, recreational boating, and wood packaging material. However, knowledge gaps remain in some key areas, such as emerging animal diseases, pet trade, cross-border dispersal from the United States, and e-trade, and work is ongoing to address priority gaps. High priority pathways that have been identified include: horticulture, aquarium and pet trade, live bait fish, containers in commercial transport, wood products, potentially injurious organisms, road construction, and recreational pathways like recreational boating and off-road ATV use. Intervention and management plans are currently under development for live bait and live food, agricultural crop pests, invasive plants, aquatic invasive species and for sea containers and in-transit shipments.

Canada is continually improving its national regulatory framework. Legislative and regulatory tools to prevent and control invasive species have been strengthened since 2014 at both the national and sub-national levels. For example, the Aquatic Invasive Species Regulations have been established to provide a suite of regulatory tools under the Fisheries Act to prevent the introduction of aquatic invasive species into Canadian waters and to control and manage their establishment and spread, once introduced. These regulations complement existing federal and provincial authorities and will be updated regularly. In 2017, twenty-eight new pests were added to the List of Pests Regulated by Canada under the *Plant Protection Act* including *Arundo donax* (giant reed) and *Lycorma delicatula* (spotted lanternfly). A risk management document for *Arundo donax* was developed and consulted by stakeholders that resulted in the regulation of this invasive plant under the Plant Protection Act in February 2018.

Canada has identified ballast water as a priority pathway for addressing the introduction of aquatic invasive species, and has a robust ballast water regulatory regime in place since 2006 that sets standards for ballast water exchange and ballast water treatment. In 2010, Canada acceded to the *International*

Convention for the Control and Management of Ships' Ballast Water and Sediments 2004 (the Convention). The Convention, which will significantly reduce the risk posed by the ballast water pathways of greatest concern, entered into force on September 8, 2017. Canada is now developing amendments to its ballast regulations as a consequence of the Convention's entry into force.

National plans and/or sub-national plans have been developed and are being advanced for priority species including Asian carps, emerald ash borer, zebra and quagga mussels, Asian gypsy moth, and *Batrachochytrium salamandrivorans* (Bsal - a disease-causing fungus that can affect salamanders), dog strangling vine, Japanese knotweed, toadflax, Phragmites, Spartina as well as other agriculturally important invasive alien species. In addition, research is conducted to help address IAS. For example, Agriculture and Agri-Food Canada partners with the Center for Agricultural and Biosciences International (CABI) to develop biological control strategies for established invasive alien species.

Provincial, territorial and regional initiatives

In 2012, the Government of Ontario released the *Ontario Invasive Species Strategic Plan* (OISSP) which describes how the Province would meet the national goals established in *An Invasive Alien Species Strategy for Canada*. In 2016, the Ontario *Invasive Species Act, 2015* (ISA), along with its first suite of regulations (20 regulated invasive species), came into force. The goal of the ISA is to support the prevention, early detection, response to and eradication of invasive species in Ontario. The regulations enable a number of prohibitions with respect to listed IAS such as possession, transport (into and within the province), release, propagation or activities related to the trade of the listed species. The Invasive Species Act also enables regulations with respect to carriers (pathways) for IAS, restricting activities which may lead to introduction or spread.

The Government of Manitoba has developed aquatic invasive species legislation under *The Water Protection Act* (2015) and *Aquatic Invasive Species* (2015) regulations which in addition to prohibitions includes instructions and specific provisions to prevent the spread of IAS in Manitoba by watercrafts, float planes, off-road vehicles and other water-related crafts. The general cleaning provisions ensure that conveyances (watercraft, water-related equipment, motor vehicles, and air-craft) are free of any aquatic invasive species or aquatic plants, free of any standing water, and are properly dry. There are also provisions targeting the commercial harvesting and sale of live bait and requiring mandatory reporting of IAS when found. Provisions further address the ability to issue decontamination and control orders and the establishment of control zones to implement activities or measures aimed at preventing the introduction into or spread out of these areas. Finally, they provide the mechanism to certify third party service provides to decontaminate watercraft and water related equipment.

The Government of British Columbia released an Invasive Species Strategic Plan (2015) and an Early Detection, Rapid Response Plan (2015), and has made updates to the *Controlled Alien Species Regulation* (2017). The province established an Invasive Mussel Defence Program in 2015 and published a *Zebra and Quagga Mussel Early Detection Rapid Response Plan* (2015). The Program consists of mandatory watercraft inspection stations, early detection monitoring and public outreach and education. The government of British Columbia also has a "*Clean Drain Dry*" campaign focused on aquatic recreation that also consists of mandatory watercraft inspection stations. Developed in collaboration with a wide range of stakeholders, the province released an updated Invasive Species Strategy for BC in 2018. The

Ministry of Transportation and infrastructure also updated their contracting expectations to include clear roles on how contractors can reduce the spread of invasive plants.

The Government of Alberta amended the *Fisheries (Alberta) Act* in 2015 and the *Fisheries (Ministerial) Regulation* in 2016 to strengthen protection against Aquatic Invasive Species including mandatory stopping at watercraft inspection stations, increased authorities for officers as it relates to aquatic invasive species, and the creation of a prohibited species list. Mandatory watercraft inspection stations are now located along provincial boarders and partner with the Canadian Border Services Agency and other bordering jurisdictions have increased watercraft inspections on an annual basis. Several educational awareness campaigns have been initiated in Alberta (which is modelled after partnering jurisdictions), focused on "*Clean Drain Dry"*, targeting boaters taking personal action to curb the spread of invaders, and "*Don't Let It Loose*" targeting anglers and pet/aquarium industry on the intentional release of aquatic organisms. A more recent campaign of "*Pull the Plug"* focuses on ensuring alignment with legislative requirements to drain boats prior to transport. Alberta also has put into practice an Early Detection and Rapid response program with a component of lake monitoring, and control efforts when aquatic invasive species are detected (which has included eradication of Ameiurus melas (Black Bullhead) in Alberta in 2015).

In addition to these above noted initiatives, other provinces have developed regulations that contribute in preventing the spread of IAS in Canada such as Québec's *Règlement sur l'aquaculture et la vente du poisson* (2012).

The Western Inter-Provincial-Territorial Agreement for Coordinated Regional Defense Against Invasive Species was signed by British Columbia, Alberta, Saskatchewan, Manitoba and Yukon in 2016. This agreement provides a framework to broaden existing collaborative work among Western Provinces to stop the spread of invasive species.

In 2013, the Conference of Great Lakes St. Lawrence Governors and Premiers' (8 U.S. states, and Ontario and Quebec) committed to work together to address the threat of aquatic invasive species, and prioritized a "least wanted list" for prevention and management. In 2014, the Governors and Premiers also established a "mutual aid" agreement to respond to shared threats to the Basin. In 2017, these commitments were enhanced through establishment of a regional enforcement memorandum of understanding to support cross-border enforcement actions, and expansion of the "least wanted" list to a total of 21 species. Since 2013, the jurisdictions have taken more than 40 separate regulatory actions to address the "least wanted" list. In 2012, Canada and the United States updated the Great Lakes Water Quality Agreement (GLWQA) to restore and protect the waters of the Great Lakes. New provisions in the agreement address aquatic invasive species, and include commitments for an early detection and rapid response initiative, ballast water discharge programs, and risk assessments to identify high risk species. The Canada Ontario Agreement on Great Lakes Water Quality and Ecosystem Health helps support implementation of Canada's commitments under the GLWQA.

Many programs at the provincial, territorial and municipal level in addition to non-governmental organisations also support the prevention and control of invasive species in Canada. For example, there

are programs dealing with goldfish, flowering rush, whirling disease, Phragmites, pale yellow iris, invasive mussels, Spartina, knotweeds and giant hogweed, to name just a few.

Collaboration and coordination in the fight against IAS

National-level cooperation on IAS prevention, early detection and rapid response, and management remains strong, but continued effort is necessary to advance collaboration between federal departments, provincial and territorial governments and other stakeholders to prevent the introduction of new species and diseases in Canada. In addition to national level cooperation, sub-regional collaboration exists across Canada through independent councils and committees.

Action on IAS remains a shared priority amongst federal-provincial-territorial governments. In 2015, the Federal-Provincial-Territorial (FPT) Ministers responsible for conservation, wildlife and biodiversity renewed their commitment to work toward the strategic goals of *An Invasive Alien Species Strategy for Canada* and agreed to establish a representative task force to support future collaborative efforts to fight IAS in Canada. In 2017, the FPT Ministers responsible for Conservation, Wildlife and Biodiversity approved the establishment of a permanent FPT Invasive Alien Species Committee (the National Committee on IAS). The National Committee on IAS will work towards advancing objectives based upon the three primary recommendations as outlined in the 2017 report on the Recommendations to Improve Invasive Alien Species Prevention and Management in Canada (See Section 2 of this report). Multi-sectoral and multi-stakeholder invasive species councils and committees are now established in 9 provinces and territories, in addition to Canadian Council on Invasive Species that has been key in increasing national and regional outreach and education on invasive alien species. The Canadian Council on Invasive Species along with the provincial and territorial councils, has initiated work on a number of national campaigns to change behavior and close pathways to prevent the spread of invasive species including but not limited to, "*Clean Drain Dry"* (targeting aquatic invasive species), "*Play Clean Go"* (targeting terrestrial invasive species), "*Don't Move Firewood* "(targeting forest pests and diseases), "*Don't Let it Loose*" (targeting the pet trade, cultural release and aquatic invasive species) and "*PlantWise"* (targeting invasive ornamental plants). The Canadian Council on Invasive Species also initiated a 2018 survey to obtain a baseline of Canadians knowledge on invasive species related to outdoor recreation, to assist in developing effective invasive species campaigns.

However, more work is needed to prevent the spread of established IAS within Canada to parts of the country where these species are currently absent. While there is effective overall management of IAS in Canada, invasive alien species remain a serious threat to Canada's biodiversity, economy and human health. Sustained and enhanced efforts are needed to improve surveillance and diagnostics, emergency response, fully implement intervention and management plans, and to address emerging pathways such as e-commerce and preparedness for cross-border dispersal from the United States and Mexico.

Indicators used in this assessment

1. Number of known new invasive alien species in Canada, by Federal Regulatory Status
2. Percent of federally regulated foreign invasive alien species not established in Canada
3. Number of intervention or management plans in place

Currently, 254 species are being federally regulated to prevent their establishment in Canada, including 23 that have been regulated for the first time since January 2012, the baseline date. None of these species have been found to have established in Canada since the baseline date. However, new introductions of species that may become invasive continue to be identified. It should be noted that active field searches for new invasive alien species are not made, although surveillance is undertaken for some species. These indicators also do not consider the spread of invasive species or diseases currently found in the country to other parts of Canada.

The Canadian Council on Invasive Species (CCIS) conducted a survey to update information on the number of management and intervention plans in place. Between 2009 and 2014, at least 47 intervention plans were developed by governments or in partnership with non-governmental organizations to address the threat of IAS. In 2016, it was reported that there were 31 intervention and management plans in place where 50% or more of the investment came from government sources, of which 24 are currently still being implemented. As of May 2018, there is a total of 73 such intervention and management plans. In addition to those plans, 21 intervention and management plans were developed independently by municipalities and NGOs, or in partnership where less than 50% of the investment came from government funding. This shows an important increasing trend in the number of intervention or management plans in place to address IAS in Canada.

Relevant websites, web links and files

- Invasive Species Act (2015): https://www.ontario.ca/laws/statute/15i22?search=invasive
- Aquatic Invasive Species – Strategies and Action Plans: http://www.dfo-mpo.gc.ca/science/environmental-environnement/ais-eae/strategies-eng.html
- Invasive Alien Species: http://biodivcanada.ca/default.asp?lang=En&n=81BC7F85-1
- Plant Pests and Invasive Species: http://www.inspection.gc.ca/plants/plant-pests-invasive-species/eng/1299168913252/1299168989280
- Plant Protection Act: http://laws-lois.justice.gc.ca/eng/acts/P-14.8/
- Regulations Amending the Wild Animal and Plant Trade Regulations: http://canadagazette.gc.ca/rp-pr/p2/2017/2017-05-31/html/sor-dors86-eng.html
- Canadian Council on Invasive Species: http://canadainvasives.ca/
- Invasive Species Center: http://www.invasivespeciescentre.ca/
- Invasive Alien Species Strategy for Canada: https://www.canada.ca/en/environment-climate-change/services/biodiversity/invasive-alien-species-strategy.html
- Aquatic Invasive Species Regulations: http://laws-lois.justice.gc.ca/PDF/SOR-2015-121.pdf
- Invasive Species Act: https://www.ontario.ca/laws/regulation/r16354
- International Maritime Organization, International Convention for the Control and Management of Ships' Ballast Water and Sediments (2004): http://www.imo.org/en/About/Conventions/ListOfConventions/Pages/International-Convention-for-the-Control-and-Management-of-Ships%27-Ballast-Water-and-Sediments-(BWM).aspx
- Regulation respecting aquaculture and the sale of fish: http://legisquebec.gouv.qc.ca/en/ShowDoc/cr/C-61.1
- Ontario Invasive Species Strategic Plan (OISSP): https://www.ontario.ca/document/invasive-species-strategic-plan-2012
- Controlled Alien Species Regulation (2017): https://www2.gov.bc.ca/gov/content/environment/plants-animals-ecosystems/invasive-species/controlled-alien-species-regulation
- Invasive Mussel Defence Program (2015): https://www2.gov.bc.ca/gov/content/invasive-mussels/invasive-mussel-defence-program

- Great Lakes Protection Act (2015): https://www.ontario.ca/laws/statute/15g24
- Manitoba Legislation and Regulations on Invasive Species: http://www.gov.mb.ca/waterstewardship/stopais/legislation.html
- Zebra and Quagga Mussel Early Detection Rapid Response Plan (2015): https://www.for.gov.bc.ca/hra/invasive-species/Publications/Prov_ZQM_EDRR_Plan.pdf
- State of Ontario's Biodiversity: http://sobr.ca/indicators/indicators-by-target/
- 2017 State of the Great Lakes Technical Report: https://binational.net/wp-content/uploads/2017/09/SOGL_2017_Technical_Report-EN.pdf
- Environ. Sci. Technol. 45, 2554-2561 "Evaluating Efficacy of an Environmental Policy to Prevent a Biological Invasion": https://pubs.acs.org/doi/ipdf/10.1021/es102655j
- 2013 DFO National Risk Assessment: http://www.dfo-mpo.gc.ca/Library/352598.pdf
- Bill 37, Invasive Species Act (2015): https://www.ola.org/en/legislative-business/bills/parliament-41/session-1/bill-37
- Great Lakes St. Lawrence Governors & Premiers Aquatic Invasive Species: www.gsgp.org/projects/aquatic-invasive-species/
- Alberta Environment and Parks' Invasive Species web page: http://aep.alberta.ca/fish-wildlife/invasive-species/default.aspx

Level of confidence of the above assessment

☐ Based on comprehensive evidence
☒ Based on partial evidence
☐ Based on limited evidence

Please provide an explanation for the level of confidence indicated above

A summary analysis of activities, priorities and pathways was conducted at the national level in 2015-16 as part of the work of the FPT Invasive Alien Species Task Force. Members of the Task Force were invited to identify key actions that are national in scope; relevant and beneficial to more than one jurisdiction; strengthen the IAS policy framework in Canada; encourage collaboration; and are cost effective and sustainable over the long term. In light of this, the Task Force developed recommendations in three strategic focus areas to support future collaborative work on IAS. Those recommendations are described in Section 2. The information contained in this section was reviewed and updated in 2018 by members of the National Committee on Invasive Alien Species.

Adequacy of monitoring information to support assessment

☐ Monitoring related to this target is adequate
☒ Monitoring related to this target is partial (e.g. only covering part of the area or issue)
☐ No monitoring system in place
☐ Monitoring is not needed

Please describe how the target is monitored and indicate whether there is a monitoring system in place

The indicator related to establishment of invasive species includes species that are discovered during normal business and determined to have established since the baseline year. In general, active field searches for new invasive alien species are not made although surveillance is undertaken for some species. Find additional information on the methodology in the relevant websites, web links, and files for more information.

Information on intervention and management plans is gathered periodically by, or on behalf of, Environment and Climate Change Canada from federal and provincial agencies with responsibility for invasive alien species management, as well as national and provincial/territorial partners through invasive species councils.

Relevant websites, web links and files

- Canadian Environmental Sustainability Indicators (CESI): https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/invasive-alien-species.html

Progress assessment: Canada Target 12

By 2020, customary use by Aboriginal [Indigenous] peoples of biological resources is maintained, compatible with their conservation and sustainable use.

Note: *The terms 'Traditional Knowledge' (TK), 'Aboriginal Traditional Knowledge' (ATK), and 'Indigenous Knowledge' (IK) are used interchangeably throughout this report. The terms TK and ATK were formally used in the Canadian context, and the government of Canada is now turning to the use of the terms 'Indigenous' and 'Indigenous Knowledge'. The terminology in the target text above was officially adopted in 2015, and the new terminology is shown in square brackets.*

Category of progress towards the implementation of the selected target

☐ On track to exceed target
☐ On track to achieve target
☐ Progress towards target but at an insufficient rate
☐ No significant change
☐ Moving away from target
☒ Unknown

Date the assessment was done

July 31, 2018

Additional information

There is limited up-to-date governmental data available to assess clear progress on this target since Canada's last report to the CBD – for example, *the Aboriginal Peoples Survey* (Statistics Canada), a key source of information for the type of data required to report on some of Canada's targets, will not be available during the timeframe for this exercise. However, information from sources such as the First Nations Information Governance Centre, the Centre for Indigenous Environmental Resources, the Nuluaq Project, and the Manitoba Métis Federation, demonstrates that First Nations, Inuit, and Métis people currently do make use of biological resources as a means of artistic and cultural expression, and that they hunt, fish and gather in order to avail themselves of important sources of traditional foods and medicine. Indigenous peoples value these activities, and accordingly, undertake initiatives which promote and facilitate the use of traditional practices and stewardship of the land. This includes a range of activities, from fruit picking, drumming, singing, instruction on canoe-building and bison hide tanning, to collaborative efforts with government on land and ecosystem management.

Progress on this target is evaluated using three indicators, summarized below, and detailed information is included in the linked attachment: Canada Target 12 Detailed Report.

Indicator 1: Number of households participating in traditional activities

There are limited data available to assess activity according to this indicator. *The Aboriginal Peoples Survey* (Statistics Canada), is a key data source for information on household participation on traditional activities, and is completed once every five years. Results from the most recent survey will not be available until late 2018.

Data from private sources provides some information on recent trends. For example, new data from the First Nations Regional Health Survey (FNRHS), conducted by the First Nations Information Governance Centre, suggests that there has been a slight decline in the rate of participation of on-reserve First Nations in traditional activities since 2010. For instance, 18.3% of survey participants reported hunting or trapping in the three months prior to the survey, compared to 22.1% in 2008-2010. Similarly, 16.8% of survey participants reported berry picking or other food gathering, compared to 28.3% in the previous survey, and 22.5% of adults reported fishing in comparison with 32.2% in 2008-2010. 8.3% of adults reported canoeing or kayaking in 2008-2010, vs. 5.7% in the most recent survey.

The First Nations Food, Nutrition, and Environment Study (University of Ottawa, Université de Montréal, and the Assembly of First Nations) shows that on average, across several provinces over the course of the last decade, 65% of on-reserve First Nations households participate in traditional harvesting activities.

Data on the participation of Inuit in traditional activities is not currently available, and it was not possible to identify data specific to Métis peoples.

There is a large volume of anecdotal information concerning current efforts, on behalf of governments and Indigenous peoples, to encourage and support the customary use of biological resources. For example, Indigenous-led Guardians programs promote environmental stewardship and land management, land-based food security initiatives, and projects aimed at reviving northern farming (see Section II of this report for information about the Indigenous Guardians Program).

Indicator 2: Consumption of Traditional Foods

The availability of data to assess activity related to this indicator is currently limited for First Nations and Inuit, and it was not possible to identify data specific to Métis peoples.

The First Nations Information Governance Centre recently released new data from the First Nations Regional Health Survey (FNRHS) indicating that on-reserve First Nations are increasingly consuming traditional foods. In the most recent survey, 96.7% of adults reported having consumed traditional foods often or at least a few times in the past year, compared to 85% in 2008-2010. Data from the First Nations Food, Nutrition, and Environment Study (led by the Assembly of First Nations, in partnership with the University of Ottawa and Université de Montréal) suggests similar trends.

According to the FNRHS, large land-based animals (moose, caribou, bear, deer, bison, etc.) were the most commonly reported protein-based traditional food often consumed in the past 12 months (30.4%, compared to 26.4% in 2008-2010) by First Nations adults, followed by: freshwater fish (24.8% compared to 22.3% in 2008-2010), game birds such as goose or duck (10.9%), small game such as rabbit or muskrat (9.9%), and saltwater fish (8.3%). In addition, First Nations adults are consuming other types of traditional foods such as bannock or fry bread (42.6%), and 26.2% reported often eating berries or other wild vegetation (compared to 18.6% in 2008-2010).

Furthermore, the FNRHS suggests there is an increase in the proportion of on-reserve youth and children reporting consumption of some traditional foods in this survey compared to the 2008-2010 survey.

New and important data should become available in the near future for Inuit. The Nunavik Health Survey (led by the Nunavik Regional Board of Health and Social Services' (NRBHSS) Public Health Department in partnership with the *Institut national de santé publique du Québec)* and the Inuit Health Survey (led by the Centre for Indigenous Peoples' Nutrition and Environment at McGill University) will provide information on traditional food consumption in Inuit regions in the near future.

Indicator 3: Case studies illustrating customary use of biological resources
As demonstrated by 10 case studies featured in this report, First Nations, Inuit, and Métis across the country continue to think of traditional, modern and creative ways of using water and land-based resources to meet their physical, social, cultural, and spiritual needs.

The harvesting of traditional foods for health and subsistence purposes is an example of the ways in which biological resources are used for customary purposes. The Centre for Indigenous Environmental Resources (CIER) has developed a food strategy centered on food security and assisting First Nation communities in the development of thriving food economies and empowerment to manage their own food systems. The food strategy is meant to increase access to traditional and healthy foods to improve health, well-being, and prosperity in First Nations. Similarly, in the North, the Nuluaq Project addresses the Inuit food insecurity crisis by promoting community-based initiatives like food banks, land-based programs, and community kitchens, all of which support the consumption of food derived from the land. These initiatives employ a range of approaches from supporting nutritional needs, teaching traditional skills, and strengthening social connections around food.

Indigenous peoples also use biological resources with the aim of celebrating culture and passing down teachings in an effort to maintain or revive ancient cultural practices. In Nova Scotia, apprentices from First Nations across the province can learn how to build a traditional birch bark Mik'maq canoe over a six-week long course at Milbrook's Cultural Centre. In Manitoba, the Manitoba Métis Federation contributes to the customary use of biological resources through various initiatives like flower beadwork circles and bison hide tanning workshops, whereby Métis citizens come together to build wooden frames to stretch raw bison hides, and clean them before smoking them for conservation. Another example is the Strawberry Teaching, which is taught to young Indigenous women and links the heart-like berry to womanhood and bringing life into the world.

There are also numerous examples of collaboration between the government and Indigenous peoples for the protection and conservation of species and the environment; for instance the restoration of the boreal forest through harvesting of moose in Nova Scotia.

Furthermore, the management of land and resources is an important consideration to support the customary use of biological resources. Through Indigenous-led Guardians programs and other initiatives like the restoration of clam gardens by the Coast Salish peoples, Indigenous peoples continue their important work as stewards of the land through ecological and cultural monitoring, protection of sensitive areas and species, etc.

Indicators used in this assessment

1. Number of households participating in traditional activities
2. Consumption of traditional foods
3. Case studies illustrating customary use of biological resources

Please describe any other tools or means used for assessing progress

Online research, literature review, interview. Please see the submission from the Native Women's Association of Canada entitled "*Indigenous Women and Girls, Traditional Knowledge, and Environmental Biodiversity Protection*". The submission pertains to biodiversity conservation over-all and more specifically to Canada Targets 12 and 15. The document is included as a linked attachment in the in the relevant websites, web links, and files for more information.

Relevant websites, web links and files

- Linked attachment: Canada Target 12 Detailed Report: http://twk.pm/h9wsv8x8m8
- Linked attachment: NWAC: Indigenous Women and Girls, Traditional Knowledge, and Environmental Biodiversity Protection : http://twk.pm/2ffqkqthns

Level of confidence of the above assessment

☐ Based on comprehensive evidence
☒ Based on partial evidence
☒ Based on limited evidence

Please provide an explanation for the level of confidence indicated above

It is difficult to monitor progress as much of the data used in the previous national report has not been updated in the interim. New data will be available later in 2018. Additionally, information on the customary use of biological resources for off-reserve First Nations, Inuit, and Métis is not generally readily available for national-scale analysis.

Adequacy of monitoring information to support assessment

☐ Monitoring related to this target is adequate
☒ Monitoring related to this target is partial (e.g. only covering part of the area or issue)
☐ No monitoring system in place
☐ Monitoring is not needed

Please describe how the target is monitored and indicate whether there is a monitoring system in place

The target is partially monitored through government statistics, but this does not cover all relevant information, and is not timed for monitoring progress according to CBD reporting. For instance, as noted above, there is updated information related to on-reserve First Nations is available, but there was very little about available information about off-reserve First Nations, Inuit, and Métis. This data will only become available after the reporting process. Other information may only partially address the target, is gathered sporadically, and may be held privately (i.e., gathered by organizations outside of government) and therefore not be readily available for reporting on this target.

Relevant websites, web links and files

- First Nations Information Governance Centre: https://fnigc.ca/
- First Nations Information Governance Centre, *First Nations Regional Health Survey*, Phase 3, Volume 2: http://fnigc.ca/sites/default/files/docs/fnigc_rhs_phase_3_volume_two_en_final_screen.pdf
- Statistics Canada, Aboriginal Peoples Survey (2017): https://www.statcan.gc.ca/eng/survey/household/3250
- Centre for Indigenous Environmental Resources (CIER): http://www.yourcier.org/
- Inuit Tapiriit Kanatami, The Nuluaq Mapping Project : https://www.itk.ca/nuluaq-mapping-project/
- Manitoba Métis Federation: http://www.mmf.mb.ca/
- The First Nations Food, Nutrition, and Environment Study (2018) : http://www.fnfnes.ca/
- McGill University Centre for Indigenous Peoples' Nutrition and Environment, Inuit Health Survey: https://www.mcgill.ca/cine/resources/ihs

Progress assessment: Canada Target 13

By 2020, innovative mechanisms for fostering the conservation and sustainable use of biodiversity are developed and applied.

Category of progress towards the implementation of the selected target

☐ On track to exceed target
☒ On track to achieve target
☐ Progress towards target but at an insufficient rate
☐ No significant change
☐ Moving away from target
☐ Unknown

Date the assessment was done

March 31, 2018

Additional information

There are a number of tools available nationally and regionally to achieve biodiversity outcomes. Outcomes can be achieved through standards, guidelines and regulations; permits and approvals; Indigenous peoples' traditional laws; commitments to voluntary agreements; economic incentives; environmental monitoring; conservation strategies; sector specific/habitat specific/ species management plans; recovery strategies; restoration, and spatial tools such as protected areas.

A 2018 report (see linked attachment in the relevant websites, web links, and files for more information) provides examples from Canada illustrating a range of innovative mechanisms to support the conservation of biodiversity and the sustainable use of its components that fall into the following categories:

- Revenue generation mechanisms
- Conservation offsets
- Tax instruments
- Planning tools
- Voluntary initiatives/multi-stakeholder initiatives
- Other policies and programs

The examples cover a range of scales from local to national, and include mechanisms that have been/are being used at all levels of government and across economic sectors. Examples have been drawn from federal, provincial, territorial, municipal, and Indigenous governments and their agencies, as well as from industry organizations and non-government organizations.

Indicators used in this assessment

Case studies which showcase the conservation and/or sustainable use of biodiversity through innovative mechanisms, in sectors and regions across Canada

Please describe any other tools or means used for assessing progress

Research and analysis

Relevant websites, web links and files

- Linked attachment: Target 13 Case Studies http://twk.pm/9xksah1uo4

Level of confidence of the above assessment

☐ Based on comprehensive evidence
☒ Based on partial evidence
☐ Based on limited evidence

Please provide an explanation for the level of confidence indicated above

The target and indicator are not finite variables – it is theoretically impossible to be aware of all innovative mechanisms - so comprehensive evidence not realistic. Expert researchers in the field have conducted a review to identify, describe and assess a number of examples that illustrate progress in the development and application of innovative approaches.

Adequacy of monitoring information to support assessment

☐ Monitoring related to this target is adequate
☐ Monitoring related to this target is partial (e.g. only covering part of the area or issue)
☒ No monitoring system in place
☐ Monitoring is not needed

Please describe how the target is monitored and indicate whether there is a monitoring system in place

There is no ongoing monitoring of this target. Information is gathered as need for reporting.

Relevant websites, web links and files

- Smart Prosperity Institute: http://institute.smartprosperity.ca/

Progress assessment: Canada Target 14

By 2020, the science base for biodiversity is enhanced and knowledge of biodiversity is better integrated and more accessible.

Category of progress towards the implementation of the selected target

☐ On track to exceed target
☐ On track to achieve target
☒ Progress towards target but at an insufficient rate
☐ No significant change
☐ Moving away from target
☐ Unknown

Date the assessment was done

February 28, 2018

Additional information

Overall, there is considerable evidence that the science base for biodiversity has been enhanced since 2011, based on publications of relevant scientific literature, enhancement of biodiversity databases, and increasing availability of data online.

There are many examples of scientific activities which help advance progress toward the target. For example, the Government of Canada conducted a review of more than 4000 scientific articles and studies and published 11 papers summarizing the current state of scientific knowledge about the boreal zone and its ecosystems in order to make this information available to those responsible for managing boreal ecosystems and natural resource development. The Government of Canada has also produced a Biodiversity Atlas in the province of Ontario which maps and identifies High Value Biodiversity Areas to support conservation policy and decision making. In order to make the data broadly accessible, it is available on the Government of Canada Open Data portal. Further details on these two examples can be found in Section II of this report.

The Government of Canada's open data portal consolidates data from across government departments and agencies and makes it available to the public through a single and searchable window, providing access to data that is produced, collected and used by departments and agencies across the federal government. This includes, for example, water quality and ecosystem health data, biological sampling information, geospatial data, maps, and more.

In its Action Plan for the Woodland Caribou (Rangifer tarandus caribou), Boreal Population, the Government of Canada initiated the creation of a new National Boreal Caribou Knowledge Consortium to enable governments, Indigenous peoples, and stakeholders to address key knowledge gaps, regularly share information and lessons learned, and to undertake studies to support boreal caribou recovery. In addition, the federal government is leading several research projects in collaboration with key partners. For example, research is being undertaken to improve our understanding of the effects of different types of disturbances on populations to support planning. More scientific work will also be done to better understand the impact of a changing climate on boreal caribou survival. The goal of this science is to

increase the chances of survival and recovery of the species in Canada through better knowledge about the species and its habitat.

BioSpace—Biodiversity monitoring with earth observation data—is a joint project of the Canadian Forest Service and the Canadian Space Agency. It uses remote sensing technology to observe the landscape, gather data on biodiversity and monitor changes. BioSpace gathers data on topography, productivity, land cover, and disturbance. The data in all four of these areas are helpful to scientists and land managers because shifts in these areas can signal shifts in biodiversity.

The EcoBiomics Project, part of the Genomics Research Development Initiative (GRDI) is a 5-year meta-genomics project launched in April 2016. It is comprised of 64 scientists from seven federal departments and agencies (Agriculture and Agri-Food Canada, Canadian Food Inspection Agency, Environment and Climate Change Canada, Fisheries and Oceans Canada, National Research Council, Natural Resources Canada, and the Public Health Agency of Canada). EcoBiomics uses genomics-based tools to better understand and promote biodiversity in a vast array of ecosystems across Canada. Agriculture and Agri-Food Canada is involved in several research/development projects within the EcoBiomics pillar that deploy genomics tools to amplify use of practices that promote; i) in-field biodiversity (for example, cover cropping, reduced tillage), and ii) landscape biodiversity resulting from a more healthy balance between natural features and arable land in agroecosystems (for example, conservation land uses such as wetland, riparian zones, and treelines).

Canadian governments partner with universities across the country to advance biodiversity science and research. One among several partnerships is the Centre for Wildlife Ecology which is a collaboration between Simon Fraser University and Environment and Climate Change Canada. Its mission is to foster high quality, graduate training and research, to conduct basic and applied research in wildlife ecology, and to provide knowledge and personnel that will help Environment and Climate Change Canada and other agencies meet the challenges of conservation in the 21st century.

The overall assessment of progress is based on the analysis and indicators below. Further work is required to complete an assessment of science required to address policy needs, and to evaluate the extent to which recent efforts are meeting those needs. Additional effort is also needed to make more information readily available, and to develop tools to better integrate data in more accessible ways especially into decision making frameworks.

1. **Completion of a national assessment of biodiversity science required to address policy needs;** A draft scoping paper on a process to identify biodiversity science needs has been prepared, through a joint federal/provincial/territorial working group. This paper includes an annex with a draft list of potential science needs and gaps related to Canada's biodiversity goals and targets. Efforts are now needed to bring together key stakeholders to complete the assessment and identify approaches to address those science needs.

2. **The number of reports written by 2020 which contribute to addressing key biodiversity science needs.**

A Web of Science search on the key words “biodiversity” and “Canada” for the time period 2011-2018 indicated 3,685 published scientific papers or related documents in the domain of “Science and Technology” among all of the data bases indexed by Web of Science (accessed on 2018-02-22). This assessment may be incomplete, as additional papers may have been published that did not use the keyword “biodiversity.”

This indicates that there have been major contributions to biodiversity science in Canada since 2011, but an assessment of the extent to which these are helping to address the key biodiversity policy needs, cannot be undertaken until after the prioritization of science needs has been completed.

3. The number of biodiversity monitoring programs contributing information to a national or provincial web portal.

The largest international web portal related to biodiversity information is the Global Biodiversity Information Facility (GBIF) with nearly 1 billion records globally. As of February 2018, this included 44.4 million records related to biodiversity in Canada, drawn from more than 1000 difference sources or programs. Only some of these observations relate to formally designed monitoring programs. More than 80% of the GBIF data are from a single program, eBird, which brings together observations from Citizen Science birders. While not a formal monitoring program, eBird provides extensive distributional and relative abundance data for birds in Canada (and globally). It can be used to map relative abundance of birds throughout many portions of Canada, and to track seasonal migration of bird populations throughout the Americas. Data from iNaturalist are also included in GBIF, though the most up-to-date are also accessible directly through the iNaturalist portal. This is another large, Citizen Science based program that gathers distribution information on a broad range of different taxa, including many groups of animals, plants and fungi. It included over 360,000 Canadian observations as of 2018-02-22. GBIF also includes museum records (see below) and some datasets from monitoring programs with formal designs to detect trends over time, although the GBIF portal does not display all of the relevant effort data needed to analyse trends.

Another Canadian biodiversity web portal is NatureCounts, managed by Bird Studies Canada. This currently includes hundreds of datasets from several biodiversity monitoring programs, predominantly for birds, but also including the Marsh Monitoring Program targeting amphibians and Renfrew County Biotabase covering a wide range of species for a single county in Ontario. NatureCounts is a node of the Avian Knowledge Network, a broad biodiversity portal for bird data that integrates data from more than 850 programs, predominantly in the Americas, with over 12 million observation records. This also includes data from some monitoring programs relevant to Canada.

All of these portals include at least some tools for visualizing data either spatially or temporally or both. The Canadian federal government has developed an online geospatial mapping platform, OpenMaps to support decision making and land-use planning. This tool currently integrates many different base layers that will be useful for biodiversity conservation. Efforts are currently underway to integrate biodiversity data with the other layers such as land cover data.

Many additional biodiversity monitoring programs exist in Canada, of which a draft preliminary inventory has been prepared, but not yet validated. For many of these programs, data are not yet available through a web portal.

4. **The number of taxonomically classified specimens in Canadian collections that are available for scientific use, and the proportion of those specimens with digital records.**

At the end of December 2017, major Canadian museum collections contained 26.23 million specimens from Canadian locations, an increase of 4.26 million relative to the total in 2013. Of these, 8.2 million (31.3%) have their specimen information digitized, an increase from 4.98 million in 2013 (22.7%). Digital data are generally available through GBIF (described above). Among the 17 collections surveyed, only 3 have their entire specimen records digitized. Detailed information can be found in the linked attachment: Canadian Specimen Collections.

Indicators used in this assessment

1. Completion of a national assessment of biodiversity science required to address policy needs;
2. The number of reports written by 2020 which contribute to addressing key biodiversity science needs;
3. The number of biodiversity monitoring programs contributing information to a national or provincial web portal;
4. The number of taxonomically classified specimens in Canadian collections that are available for scientific use, and the proportion of those specimens with digital records.

Please describe any other tools or means used for assessing progress

The assessment used several online search tools to evaluate each of the indicators for Canada Target 14, as listed below.

Relevant websites, web links and files

- Global Biodiversity Information Facility: https://www.gbif.org/
- NatureCounts: https://www.birdscanada.org/birdmon/default/main.jsp
- eBird: https://ebird.org/canada/home
- iNaturalist: inaturalist.ca
- Avian Knowledge Network: http://www.avianknowledge.net/index.php?page=home
- Open Maps: https://open.canada.ca/en/open-maps
- Web of Science: https://webofknowledge.com/
- NatureServe Canada: http://www.natureserve.org/natureserve-network/canada
- Linked attachment: Canada Target 14 Canadian Specimen Collections: http://twk.pm/igpo5whtlg
- Genomics Research Development Initiative: http://grdi-irdg.collaboration.gc.ca; https://www.canada.ca/en/national-research-council/news/2016/11/genomics-research-development-initiative.html

Level of confidence of the above assessment

☐ Based on comprehensive evidence
☒ Based on partial evidence
☐ Based on limited evidence

Please provide an explanation for the level of confidence indicated above

The assessment is based on metrics including numbers of scientific publications and quantity of observational/distributional data that are currently available publicly. This assessment does not consider the relevance of the data and publications for meeting policy needs and conservation decisions, nor does it consider information that is not publicly available, but may be available to decision makers in particular jurisdictions (e.g., unpublished or internal reports, or monitoring programs that do not make data available through public portals).

An assessment of science requirements to meet policy needs should be completed as a first step to assess the extent to which these scientific activities and data are contributing towards the highest priority information needs.

Adequacy of monitoring information to support assessment

☐ Monitoring related to this target is adequate
☒ Monitoring related to this target is partial (e.g. only covering part of the area or issue)
☐ No monitoring system in place
☐ Monitoring is not needed

Please describe how the target is monitored and indicate whether there is a monitoring system in place

This target is being monitored through metrics related to scientific publications and availability of data through public web portals. This approach is considered partial, as it does not take into account "grey" literature (e.g., unpublished or internal reports) which can nevertheless be useful to inform policy decisions. It also does not consider observational or distributional data that are not published or are only available through portals with limited or restricted access, but which may still be available to support decision making in some venues.

Relevant websites, web links and files

- Global Biodiversity Information Facility: https://www.gbif.org/
- NatureCounts: https://www.birdscanada.org/birdmon/default/main.jsp
- eBird: https://ebird.org/canada/home
- iNaturalist: inaturalist.ca
- Avian Knowledge Network: http://www.avianknowledge.net/index.php?page=home
- Open Maps: https://open.canada.ca/en/open-maps
- Web of Science: https://webofknowledge.com/
- NatureServe Canada: http://www.natureserve.org/natureserve-network/canada

Progress assessment: Canada Target 15

By 2020, Aboriginal Traditional Knowledge [Indigenous Knowledge] is respected, promoted, and, where made available by Aboriginal [Indigenous] peoples, regularly, meaningfully, and effectively informing biodiversity conservation and management decision-making.

Note: *The terms 'Traditional Knowledge' (TK), 'Aboriginal Traditional Knowledge' (ATK), and 'Indigenous Knowledge' (IK) are used interchangeably throughout this report. The terms TK and ATK were formally used in the Canadian context, and the government of Canada is now turning to the use of the term 'Indigenous' and 'Indigenous Knowledge'. The terminology in the target text above was officially adopted in 2015, and the new terminology is shown in square brackets.*

Category of progress towards the implementation of the selected target

☐ On track to exceed target
☐ On track to achieve target
☒ Progress towards target but at an insufficient rate
☐ No significant change
☐ Moving away from target
☐ Unknown

Date the assessment was done

July 31, 2018

Additional information

As Canada's first inhabitants, Indigenous peoples have a unique relationship with its ecosystems, species, and resources. They possess valuable knowledge of flora and fauna, gained from long-term close interaction with ecosystems, and which they apply in their ongoing customary use of biological resources.

There is limited data to support a complete assessment of progress on Target 15. Efforts are underway however, to move forward on this target. While more work could be done, the incorporation of Indigenous knowledge (IK) is already a valuable contributor to the effectiveness of Canada's various biodiversity initiatives, providing information regarding the sustainable use of plants and animals, as well as the relationships and current stresses in ecosystems.

Environment and Climate Change Canada (ECCC) initiated steps to maintain information on federal and provincial/territorial mechanisms in place across the country that allow for IK to inform government decision-making; however, this work is in its early stages and data available for this assessment is inconclusive. Information on Indigenous languages (important repositories of IK) is collected regularly by Statistics Canada; however, the most comprehensive data to demonstrate trends in linguistic diversity will not be available until after the Sixth National Reports are submitted to the CBD Secretariat. Regardless, available data, as well as anecdotal information from case studies, allows for an account of some level of evaluation since the last report and can provide a basic portrait of current activity related to this target.

Progress on Target 15 is evaluated using four indicators, summarized below, and detailed information is included in the linked attachment: Canada Target 15 Detailed Report.

Indicator 1: Number of mechanisms in place for Aboriginal Traditional Knowledge (Indigenous Knowledge, or IK) to inform decision-making

In 2014 ECCC began to compile information about federal, provincial, territorial, and Indigenous governments' mechanisms in Canada that allow for IK to inform government decision-making. In this context "mechanisms" represent all procedures and means existing within a governance structure to have IK inform biodiversity conservation, management, and decision-making.

The current assessment found that new mechanisms have been created since 2014. The total number of mechanisms found is 147, in comparison to 113 mechanisms reported in 2014. Of the 34 new mechanisms reported, 30 were created prior to 2014 and 4 are new. This suggests that there has been limited progress in the creation of new mechanisms relevant to this target, but the means for collecting this information is not comprehensive and results are considered indicative.

Examples of mechanisms in place for IK to inform decision-making include wildlife management boards, species assessment and recovery strategies, as well as environmental impact assessment, legislation, policies and processes. A recent example is the creation of the Indigenous Circle of Experts, a group formed to provide advice from Indigenous peoples on the concept of Indigenous Protected and Conserved Areas in light of Canada Target 1, informed by Indigenous knowledge and experience in Indigenous-led conservation. See description "Making progress toward achieving Canada Target 1" in Section II of this report. Another important recent example is that the Federal Climate Change Science Plan explicitly recognizes the importance of integrating Indigenous knowledge alongside scientific research (see "Making progress towards Canada Target 5" in Section II of this report for more information on the Plan).

It is important to note that IK is based on culturally sensitive information. Any action taken by governments to use IK must be done with the consent of, and in partnership with, Indigenous custodian communities.

Indicator 2: Case studies assessing effectiveness of established mechanisms for IK to inform decision-making

ECCC conducted a scoping study in 2014 in an effort to enable the assessment of mechanisms and governance structures in place in Canada through which IK can inform biodiversity conservation and management decision-making.

As part of this study, four critical case studies were conducted to better understand the effectiveness of structures or mechanisms in place in Canada through which IK has successfully informed biodiversity conservation and management practices. Notable examples include the IK Subcommittee on the Status of Endangered Wildlife in Canada (COSEWIC), whereby the subcommittee assisted in the acquisition and integration of IK into the COSEWIC status assessment process, and the Nunavut Wildlife Management Board, whereby partners work together to combine the knowledge and understanding of wildlife managers, users, and the public to make decisions concerning the management of wildlife in Nunavut.

These case studies were assessed to measure progress on this indicator as well as progress on Target 15 in general. They show concrete examples of efforts being made to build robust structures for a better inclusion of IK in conservation decision-making.

COSEWIC works closely with Indigenous peoples to decide how Indigenous knowledge will be incorporated into the process of assessing species at risk through the Indigenous Knowledge Subcommittee. Incorporating this knowledge into COSEWIC's assessment of species at risk improves the process, and therefore the quality of designations made by COSEWIC, by bringing information and perspectives on wildlife species that are not available in published scientific literature.

Indicator 3: Case studies illustrating best practices in promoting IK or having it inform decision-making

The case studies assessed in relation to this indicator show concrete examples of the promotion of IK in decision-making processes, suggesting that Canada is increasingly developing methods to respectfully include IK in conservation decision-making, both at the policy and institutional level. These include examples of scientists and government officials collaborating with Indigenous knowledge holders on research projects and conservation initiatives, as well as examples of IK considerations in the context of conservation agreements.

Indigenous reviewers have noted that further opportunities could be explored to use IK in a way that is more inclusive of Indigenous perspectives and that allows for increased participation of knowledge holders in decision-making processes. The case studies related to this indicator are however, a sign of progress.

Indicator 4: Trends in linguistic diversity and number of speakers of Aboriginal (Indigenous) languages

According to the 2016 Canada Census, there has been an increase, in absolute terms, in the number of speakers of Indigenous languages among Indigenous identity populations (First Nations, Métis, and Inuit) since 2011. However, this increase has not kept pace with the increase in population sizes. Thus, there is a decrease in the percentage of Indigenous peoples able to speak Indigenous languages, suggesting a downward trend.

Based on data provided by the 21st edition of the *Ethnologue*, a global tool that measures trends in linguistic diversity around the world, the number of Indigenous languages, as well as their status, has not shifted significantly since 2014. In absolute terms, over 60% of Indigenous languages are either threatened, moribund, nearly extinct, or dormant.

Paired with a decrease in the percentage of Indigenous populations able to speak an Indigenous language, this suggests a downward trend in linguistic diversity.

It should be noted that these conclusions are solely based on evidence provided by the 2016 *Canada Census* and the *Ethnologue*. A more comprehensive source of information on Indigenous languages, the *Aboriginal Peoples Survey*, is expected to be released at the end of 2018, and will paint a more fulsome picture of trends in linguistic diversity in Canada.

There are notable examples concerning current initiatives where efforts are being made to preserve and promote the use of Indigenous languages. For example, the Aboriginal Languages Initiative at the

Department of Canadian Heritage supported the direct participation of 5,137 people in Indigenous language activities in 2016-2017. These included projects such as language instruction for pre-school children, digital presentation of languages, and language immersion programs and resources.

Since the submission of Canada's 5th National Report to the CBD, the Government of Canada has committed to taking significant action to support preservation and revitalization of Indigenous languages. For example, in 2016, the Government of Canada announced that it will enact an *Indigenous Languages Act*, co-developed with Indigenous peoples, with the goal of ensuring the preservation, promotion, and revitalization of First Nations, Métis, and Inuit languages in Canada. On June 15, 2017, the Department of Canadian Heritage, the Assembly of First Nations, Inuit Tapiriit Kanatami and the Métis Nation Council launched the co-development of Indigenous languages legislation and agreed on a collaborative engagement process.

In 2017 the Government of Canada also committed to invest $89.9 million to support Indigenous languages and cultures. This investment is in addition to existing program funding provided by the Department of Canadian Heritage, and will support community-based projects that facilitate communication in, and revitalization of, Indigenous languages. Funding will also be provided to support the digitization of Indigenous languages and oral histories.

Indicators used in this assessment

1. Number of IK mechanisms in place to inform decision-making
2. Case studies assessing effectiveness of IK mechanisms
3. Case studies illustrating best practices in incorporating IK or having it inform decision-making
4. Trends in linguistic diversity

Please describe any other tools or means used for assessing progress

Peer-reviewed articles, stories, discussions with Indigenous governments, other data. Please see the submission from the Native Women's Association of Canada entitled "*Indigenous Women and Girls, Traditional Knowledge, and Environmental Biodiversity Protection*". The submission pertains to biodiversity conservation over-all and more specifically to Canada Targets 12 and 15. The document is included as a linked attachment in the relevant websites, web links, and files for more information.

Relevant websites, web links and files

- Linked attachment: Canada Target 15 Detailed Report: http://twk.pm/ml9hcfhoq3
- Linked attachment: Canada Target 15 Baseline Report: http://twk.pm/m9chuiklvu
- Linked attachment: Canada Target 15 Table of IK Decision Mechanisms: http://twk.pm/keolk7elry
- Linked attachment: NWAC: Indigenous Women and Girls, Traditional Knowledge, and Environmental Biodiversity Protection http://twk.pm/2ffqkqthns
- Indigenous Circle of Experts for Pathway to Canada Target 1: http://www.conservation2020canada.ca/the-pathway/
- COSEWIC Indigenous Knowledge Subcommittee: https://www.canada.ca/en/environment-climate-change/services/committee-status-endangered-wildlife/aboriginal-traditional-knowledge-subcommittee.html

Additional links are provided in the Canada Target 15 Detailed Report.

Level of confidence of the above assessment

☐ Based on comprehensive evidence
☒ Based on partial evidence
☐ Based on limited evidence

Please provide an explanation for the level of confidence indicated above

Data currently available on linguistic trends is only partial. Information on IK mechanisms is also partial, and the quality of information could be improved. This assessment is based on partial evidence, but there is full confidence that the data that was used is accurate.

Adequacy of monitoring information to support assessment

☐ Monitoring related to this target is adequate
☒ Monitoring related to this target is partial (e.g. only covering part of the area or issue)
☐ No monitoring system in place
☐ Monitoring is not needed

Please describe how the target is monitored and indicate whether there is a monitoring system in place

Canada Target 15 is partially monitored through ongoing government statistics programs. Their release is not timed to inform progress on all indicators every four years to coincide with Canada's National Reports to the CBD. Other indicators are not systematically monitored, thus a complete picture of progress on this target is not readily available.

Relevant websites, web links and files

- Statistics Canada: 2016 Census of Population: Aboriginal Peoples: http://www12.statcan.gc.ca/census-recensement/2016/ref/98-501/98-501-x2016009-eng.cfm
- Statistics Canada: National Household Survey: Aboriginal Peoples: https://www150.statcan.gc.ca/n1/en/catalogue/99-011-X
- Statistics Canada: Aboriginal Peoples Survey: http://www23.statcan.gc.ca/imdb/p2SV.pl?Function=getSurvey&SDDS=3250

Progress assessment: Canada Target 16

By 2020, Canada has a comprehensive inventory of protected spaces that includes private conservation areas.

Category of progress towards the implementation of the selected target

☐ On track to exceed target
☐ On track to achieve target
☒ Progress towards target but at an insufficient rate
☐ No significant change
☐ Moving away from target
☐ Unknown

Date the assessment was done

January 31, 2018

Additional information

Conservation Areas Reporting and Tracking System

The Conservation Areas Reporting and Tracking System (CARTS) is a database containing authoritative and up-to-date protected areas data from the federal, provincial, and territorial government protected areas agencies (with the exception of Indigenous governments; see *Current discussions and potential future changes* below for details). The database makes use of the International Union for Conservation of Nature protected area definition, management categories and governance types as its standardized framework for reporting and mapping, allowing inter-organisational comparisons and national protected areas reporting and mapping. Federal, provincial, and territorial government protected areas agencies currently submit yearly updates to keep data current.

New methods incorporated into Canada's protected spaces tracking and reporting system

Two updates were made to the methods used for reporting and tracking protected and conserved areas:

1. In 2014 the ecological framework for Canada, which divides Canada into ecological zones, was updated based on new information about the boundaries between ecosystems. The updated ecological framework enables better analysis and reporting of the percent of each ecozone that is protected, which is an important indicator of the status of Canada's protected areas network.
2. In 2015 the official area of Canada's ocean estate was also updated. This revision has resulted in a better estimate of the percent of Canada's coastal and marine areas conserved and therefore Canada's progress toward the 10% target.

New elements incorporated into Canada's protected spaces tracking and reporting system

Since the previous version of this report, the CARTS database as well as the corresponding procedural manual and database schema have been updated. This was done to allow for more precise reporting and in preparation for potential upcoming changes to how protected and conserved areas are defined in Canada. Four new fields were added to the database: other effective area-based conservation measures (OECM), delisted date, management regime and sub-surface right status.

Other effective area-based conservation measures
This field was added in order to allow the inclusion of OECM in the database. A national definition and criteria for terrestrial OECM is currently in development through a joint national-subnational initiative (Pathway to Canada Target 1) and is expected in 2018. For more information please see "Making progress toward achieving Canada Target 1", in Section II of this report.

National operational guidance for identifying and reporting on marine OECMs has been developed and released. This guidance was informed by discussions taking place through the International Union for Conservation of Nature (IUCN) Task Group on OECMs, the CBD's Subsidiary Body on Scientific, Technical and Technological Advice, and the Canadian Council of Ecological Areas.

De-listed date: This field was created to display the year of termination of protected and conserved areas. This allows for the preservation of information on previously existing (delisted) areas as well as the analysis of historical trends.

Management regime: This field was added to allow the recognition and distinction of areas as being either privately governed, under shared governance, governed by Indigenous peoples or governed by governments.

Sub-surface right status: This field contains the name of the agencies, organizations and/or individuals who hold ownership of the sub-surface rights for exploration and exploitation, including oil and gas, of the protected or conserved area.

Technical issues and barriers related to the inclusion of private protected areas (and OECM and Indigenous Protected and Conserved Areas (IPCA)) have been removed through improvements to CARTS. However, Canada has not yet overcome the procedural barriers related to the inclusion of this data in the national tracking system. Data acquisition has, up to 2018, been largely led by national and subnational governments. To comprehensively track private protected areas, OECM, and IPCA the data acquisition process will have to be modified.

Current discussions and potential future changes
A jointly-led national and sub-national initiative working to determine how Canada Target 1 can be achieved (known as the Pathway to Canada Target 1) is currently examining Canada's approach to the recognition of protected and conserved areas. This includes exploring ways that Canada can track and report privately protected and conserved areas as well as IPCAs more equitably while ensuring that data are accurate, up to date and commensurate with national guidance. Under the Pathway process, Canada is working with Indigenous organizations, land trust organizations, and municipalities to create a reporting process. Significant progress is expected to be made by 2020 to have more comprehensive inventory of protected and conserved areas, however it is unlikely that all privately protected and conserved areas will be accounted for by then. This process will continue beyond 2020.

Indicators used in this assessment

1. The establishment of a centralized comprehensive inventory
2. The number and/or nature of new elements and/or methods that are incorporated into Canada's protected spaces tracking and reporting system

Please describe any other tools or means used for assessing progress

The Canadian national government produces an annual summary report on the status of protected areas in the country using data from the CARTS database (see Canadian Environmental Sustainability Indicators under Relevant websites, web links and files). A more in-depth report, the Canadian Protected Areas Status Report, is produced every five years. The next report will cover the period from 2016 to 2020. CARTS data are also used to track and report on progress towards both the Canadian and international biodiversity targets (Canada Target 1 and Aichi Target 11).

Relevant websites, web links and files

- CARTS data are available on the Canadian Council on Ecological Areas' website: http://www.ccea.org/carts/
- National annual summary on Canadian Environmental Sustainability Indicators – Canada's Protected Areas: https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/conserved-areas.html
- Five year report - Canadian Protected Areas Status Report 2012 – 2015: https://www.canada.ca/en/environment-climate-change/services/wildlife-habitat/publications/protected-areas-report-2012-2015.html

Level of confidence of the above assessment

☒ Based on comprehensive evidence
☐ Based on partial evidence
☐ Based on limited evidence

Please provide an explanation for the level of confidence indicated above

Yearly updates to the CARTS database and regular use of the data for reporting as well as regular review and adaptive management of the database by a community of practice.

Adequacy of monitoring information to support assessment

☒ Monitoring related to this target is adequate
☐ Monitoring related to this target is partial (e.g. only covering part of the area or issue)
☐ No monitoring system in place
☐ Monitoring is not needed

Please describe how the target is monitored and indicate whether there is a monitoring system in place

The CARTS data can be queried to identify changes in the dataset year-over-year. The database is actively maintained and routinely updated. Modifications to the database structure or methods used to report are documented. The community of practice involved in the evolution of the database continually reviews and discusses modifications.

Progress assessment: Canada Target 17

By 2020, measures of natural capital related to biodiversity and ecosystem services are developed on a national scale, and progress is made in integrating them into Canada's national statistical system.

Category of progress towards the implementation of the selected target

☐ On track to exceed target
☒ On track to achieve target
☐ Progress towards target but at an insufficient rate
☐ No significant change
☐ Moving away from target
☐ Unknown

Date the assessment was done

December 29, 2017

Additional information

Since the last report, Statistics Canada has continued to work on incorporating an increasing body of ecosystem-related data and elements of natural capital within the national statistics system. This includes releasing data through the online database, as well as publishing tables, charts, maps and analysis in the annual report, *Human Activity and the Environment* (HAE). This report has remained among the agency's most frequently downloaded or viewed publications and continues to generate significant downloads and page views, with an annual average of 23,050 downloads and 171,700 page hits from 2012 to 2018.

Recent relevant releases of HAE have focused on 1) landscape change in and around Canadian census metropolitan areas; 2) freshwater supply, use, and condition of freshwater ecosystems; 3) agriculture in Canada; and 4) forests in Canada.

1. Landscape change in and around Canadian census metropolitan areas (CMAs): In 2015, Statistics Canada measured urban expansion and densification for Canada's 33 CMAs, mapping and analyzing land cover/land use data for a newly defined area, the census metropolitan area-ecosystem (CMA-E). This CMA-E is a spatial unit that combines CMAs with an environmental geography—the Soil Landscapes of Canada (SLC).

   Although it is not meant to delineate ecosystems as such, the CMA-E allows the analysis of metropolitan areas from an ecosystem perspective. It recognizes that cities, with their politically and administratively defined boundaries, depend on natural surroundings to provide ecosystem goods and services, as well as the physical space for urban expansion. Use of this unit allows for the development of a fuller picture of land use change and urban expansion around CMAs since these often occur on environmental assets including land located outside existing city boundaries. In other words, the spatial expansion of the built-up area results in the loss of ecosystem assets and of ecosystem services. This publication included maps and digital spatial datasets for each CMA, which were also made available through the Federal Geospatial Platform (FGP), for example the *Built-up area of Kingston's census metropolitan area and census metropolitan area-ecosystem* and data released on *land cover and land use for selected geographical areas.*

2. *Freshwater supply, use, and condition*: In 2017, Statistics Canada updated data and analysis on freshwater supply and use that had previously been released in the 2010 publication of *Human*

Activity and the Environment and the 2003 publication of *Human Activity and the Environment*. In addition, this new release added data on anthropogenic pressures on aquatic ecosystems and provided condition indicators for each of Canada's 25 drainage regions, presented as drainage region profiles. Freshwater supply was mapped and spatial datasets are provided in the publication and through the FGP, for example the *Freshwater resource files*, data on *annual water yield for selected drainage regions and Southern Canada*, and *median, maximum and minimum monthly water yield for selected drainage regions.*

3. *Agriculture in Canada:* In 2014, Statistics Canada provided analysis and data tables on agriculture from an ecosystems perspective. It provided data and analysis on the amount of high quality agricultural land lost to settled area by ecozone, as well as the provision of selected ecosystem services associated with agricultural land.

4. *Forests in Canada*: Further measures of natural capital related to biodiversity and ecosystem services were made available in March 2018. This release, focusing on forests, expands on ecosystems data holdings (and other environmental data) in accordance to the data framework developed during the 2011-2013 project titled Measuring Ecosystem Goods and Services project (Statistics Canada, 2013, "*Measuring ecosystem goods and services in Canada*," *Human Activity and the Environment*, Catalogue no. 16-201-X), where information is compiled, presented and analysed for each of the following categories: ecological infrastructure, ecosystem services, beneficiaries, and environmental management.

Indicators used in this assessment

1. The number of individual elements of natural capital for which Statistics Canada has published national-scale data tables
2. The number and extent of individual elements of natural capital for which Statistics Canada has published national-scale map layers
3. The number of ecosystem services for which there is national-scale data

Please describe any other tools or means used for assessing progress

Count of downloads and page views for the publication Human Activity and the Environment since 2012-13.

Relevant websites, web links and files

- Statistics Canada, 2010: *Human Activity and the Environment*: https://www150.statcan.gc.ca/n1/pub/16-201-x/2010000/part-partie1-eng.htm
- Statistics Canada, 2003: *Human Activity and the Environment*: https://www150.statcan.gc.ca/n1/pub/16-201-x/16-201-x2003000-eng.pdf
- Statistics Canada, 2013, "*Measuring ecosystem goods and services in Canada*," Human Activity and the Environment 2013, Catalogue no. 16-201-X. https://www150.statcan.gc.ca/n1/pub/16-201-x/16-201-x2013000-eng.htm
- Statistics Canada, 2014, "*What is the value of an ecosystem? Teacher's Kit for Human Activity and the Environment 2013: Measuring ecosystem goods and services in Canada,"* Human Activity and the Environment – Teacher's kit, Catalogue no. 16-507-X. https://www150.statcan.gc.ca/n1/pub/16-507-x/16-507-x2014001-eng.htm

- Statistics Canada, 2014, "*Agriculture in Canada,"* Human Activity and the Environment 2014, Catalogue no. 16-201-X. https://www150.statcan.gc.ca/n1/pub/16-201-x/16-201-x2014000-eng.htm
- Statistics Canada, 2015, "*The changing landscape of Canadian metropolitan areas*," Human Activity and the Environment 2015, Catalogue no. 16-201-X. https://www150.statcan.gc.ca/n1/pub/16-201-x/16-201-x2016000-eng.htm
- Statistics Canada, 2016, *"Freshwater in Canada,"* Human Activity and the Environment 2016, Catalogue no. 16-201-X. https://www150.statcan.gc.ca/n1/pub/16-201-x/16-201-x2017000-eng.htm
- Statistics Canada, 2017, "*Forests in Canada,"* Human Activity and the Environment 2017, Catalogue no. 16-201-X. https://www150.statcan.gc.ca/n1/pub/16-201-x/16-201-x2018001-eng.htm
- Statistics Canada Map 3.11: *Built-up area of Kingston's census metropolitan area and census metropolitan area-ecosystem*: https://www150.statcan.gc.ca/n1/pub/16-201-x/2016000/m-c/map3.11-eng.htm
- Statistics Canada, *Land cover and land use for selected geographical areas*: https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=3810028001
- Statistics Canada, Section 3: Drainage region profiles: Freshwater supply, use, and condition: https://www150.statcan.gc.ca/n1/pub/16-201-x/2017000/sec-3-eng.htm
- Freshwater resource files: http://www.statcan.gc.ca/eng/mgeo/freshwater
- Statistics Canada, *Annual water yield for selected drainage regions and Southern Canada*: https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=3810028301
- Statistics Canada, *Median, maximum and minimum monthly water yield for selected drainage regions:* https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=3810000301

Level of confidence of the above assessment

☒ Based on comprehensive evidence
☐ Based on partial evidence
☐ Based on limited evidence

Please provide an explanation for the level of confidence indicated above

Every new dataset is carefully researched, developed, peer-reviewed by federal authorities, published as national statistics and widely consulted.

Adequacy of monitoring information to support assessment

☐ Monitoring related to this target is adequate
☐ Monitoring related to this target is partial (e.g. only covering part of the area or issue)
☐ No monitoring system in place
☒ Monitoring is not needed

Progress assessment: Canada Target 18

By 2020, biodiversity is integrated into the elementary and secondary school curricula.

Category of progress towards the implementation of the selected target

☐ On track to exceed target
☒ On track to achieve target
☐ Progress towards target but at an insufficient rate
☐ No significant change
☐ Moving away from target
☐ Unknown

Date the assessment was done

February 28, 2018

Additional information

In a 2014 scan of provincial and territorial governments, of the five provinces and territories reporting, all indicated that biodiversity had been integrated in the elementary and secondary school curricula and all indicated that biodiversity is a specific unit or theme within the curriculum. In the 2018 scan, of the ten provinces and territories reporting, all indicated that biodiversity has been integrated into the curriculum. The majority of jurisdictions also reported that key concepts and terms related to biodiversity understanding and awareness are taught across all grade levels (grades 1-12). Topics and concepts include: the science of the diversity of life (e.g., habitats and communities); the role of living things within ecosystems (e.g., food webs); human impacts on biodiversity (e.g., invasive species and habitat loss); economic and technological utility of biodiversity (e.g., ecosystem services); socio-cultural perspectives and the role of governments (intrinsic and inherent value, conservation and protection). Teaching about biodiversity cuts across subject areas with primary focus in science and geography, and it also forms part of learning content in social studies and career and technology studies. In some jurisdictions, biodiversity is an element within mandatory courses that all students must complete at the elementary and secondary levels. The results of the 2018 questionnaire can be found in the linked attachment in the relevant websites, web links, and files for more information.

Indicators used in this assessment

1. The number of Canadian jurisdictions that have integrated biodiversity into elementary and secondary curricula. [***Note:*** Under Canada's Constitution, education is a matter of exclusive provincial jurisdiction. Additionally, Canada's territories -- Northwest Territories, Nunavut and Yukon -- have received legislative authority from the federal government over public education.]

Please describe any other tools or means used for assessing progress

Information about the integration of biodiversity into the elementary and secondary school curricula was provided by Canada's provinces and territories in a questionnaire distributed to the jurisdictions. The questionnaire asked whether biodiversity was a specific unit or theme taught in schools and at what grade level and subject area. Additionally, jurisdictions were asked what specific biodiversity topics or concepts were contained within the curriculum. The selection of topics and concepts was generated from a review of papers published by the Biodiversity Education and Awareness Network (Ontario), Learning for a

Sustainable Future (Canada) and the Education Committee of the Society for Conservation Biology (international) that outlined key foundational learning elements. While curriculum may not contain discrete units on biodiversity, this question helps assess whether the equivalent of foundational understanding of key biodiversity topics and concepts is taught in schools. The questionnaire asked about environmental education policies as well as outdoor and experiential learning, important components to support the understanding and awareness of biodiversity.

Supporting the teaching about biodiversity in Canadian schools, many biodiversity non-government organizations develop and make available to teachers learning modules on biodiversity for classroom or outdoor learning settings. To date, no comprehensive survey of these resources has been undertaken, though several organizations provide a clearinghouse mechanism of available modules (e.g., *Learning for a Sustainable Future*).

Relevant websites, web links and files

- Linked attachement: 2018 Questionnaire Results: http://twk.pm/r7g23vpd17
- In the *State of Ontario's Biodiversity* report, the province of Ontario reports on the integration of biodiversity in the school curricula. The report for this target is available from the referenced website: http://sobr.ca/indicators/indicators-by-target/
- Learning for a Sustainable Future: www.r4r.ca

Level of confidence of the above assessment

☐ Based on comprehensive evidence
☒ Based on partial evidence
☐ Based on limited evidence

Please provide an explanation for the level of confidence indicated above

Given not all jurisdictions completed the questionnaire, a complete assessment of the progress toward the 2020 goal of integrating biodiversity into the curricula cannot be made.

Adequacy of monitoring information to support assessment

☒ Monitoring related to this target is adequate
☐ Monitoring related to this target is partial (e.g. only covering part of the area or issue)
☐ No monitoring system in place
☐ Monitoring is not needed

Please describe how the target is monitored and indicate whether there is a monitoring system in place

The assessment for this target is based on an indicator that depends on periodic surveying of Canadian jurisdictions to gain an understanding of whether biodiversity has been integrated into the curricula of elementary and secondary schools. Provincial and territorial biodiversity contacts collaborate with education specialists in each jurisdiction to complete the questionnaire.

Relevant websites, web links and files

Selected links to provincial and territorial curriculum documents used to assess progress on this target:

- Quebec Science and Technology: http://www.education.gouv.qc.ca/fileadmin/site_web/documents/PFEQ/6c-sciencetechno.pdf
- Alberta Education: http://education.alberta.ca/teachers/program.aspx
- Northwest Territories Experimental Science: https://nwtresearch.com/sites/default/files/experiential_science10-20-30_screen.pdf
- Newfoundland Labrador Curriculum Guides: http://www.ed.gov.nl.ca/edu/k12/curriculum/guides/index.html
- New Brunswick Curriculum Development: http://www2.gnb.ca/content/gnb/en/departments/education/k12/content/anglophone_sector/curriculum_anglophone.html#1
- Ontario Curriculum Grades 9 – 12: http://www.edu.gov.on.ca/eng/curriculum/secondary/environment.html
- Ontario Curriculum Grades 1-8 : http://www.edu.gov.on.ca/eng/curriculum/elementary/environment.html

Progress assessment: Canada Target 19

Target 19. By 2020, more Canadians get out into nature and participate in biodiversity conservation activities.

Category of progress towards the implementation of the selected target

☐ On track to exceed target
☒ On track to achieve target
☐ Progress towards target but at an insufficient rate
☐ No significant change
☐ Moving away from target
☐ Unknown

Date the assessment was done

February 2, 2018

Additional information

Canada is on track to achieve Target 19. More Canadians appear to be getting out into nature and participating in biodiversity conservation activities. Progress toward this target was assessed using four indicators, drawing on data from the national *Households and the Environment Survey*, data from several biodiversity monitoring programs, visitation statistics from government parks agencies across the country, and supplementary information from several other sources (in the relevant websites, web links, and files for more information).

The *Households and Environment Survey*, which is conducted every two years, measures the environmental practices and behaviours of Canadian households (with the exception of the Territories) that relate to the condition of Canada's air, water and soils. In 2015, 17% of Canadian households reported that they took action to protect the environment by, for example, engaging in unpaid activities aimed at conserving or protecting the environment or wildlife, participating in cleaning up shorelines or other areas, monitoring or assessing wild species or natural habitats, or teaching about nature. The trend since the survey was initiated shows a slight decline: in 2011, 19% of Canadian households engaged in these activities, and in 2013 18% of Canadian households engaged in these activities.

An increasing number of Canadians participated in voluntary citizen-science monitoring programs. Information on annual participation was assessed from several major monitoring programs operating in Canada: the Breeding Bird Survey, Christmas Bird Count, eBird, and iNaturalist. The trend since 2011 shows an overall increase in participation in these programs as well as an increase in effort. The data demonstrating this trend can be seen in *Canadian participation in citizen science monitoring programs* (see linked attachment in the relevant websites, web links, and files for more information). The number of participants and levels of effort in the Breeding Bird Survey and Christmas Bird Count were stable or increased slightly over the period. The number of participants submitting checklists to eBird increased each year as did the number of checklists submitted. iNaturalist, which was launched in Canada in 2011, saw a large increase year-over-year in the number of observers submitting information about wildlife observations in Canada. The number of observations submitted to iNaturalist also increased dramatically

in 2017 thanks to a country-wide push to promote participation in bioblitzes as part of Canada's 150th anniversary celebrations.

Park visitation rates from reporting federal, provincial and territorial government parks agencies across the country show an overall increase in visitation. Over the five year period from 2012 to 2016, visitation increased in 7 out of 8 parks systems reporting and remained stable in one, as demonstrated in *Visitation summary for Canadian parks systems* (see linked attachment in the relevant websites, web links, and files for more information).

The Households and Environment Survey also asked Canadians about visits to parks and green spaces. This broad term is meant to include municipal neighbourhood parks, public gardens, riverside or forest trails or other types of outdoor areas, but could also include more formal conservation areas or federal, provincial or territorial government parks. In 2015, 87% of Canadian households reported that they live within 10 minutes of a park or green space and 87% of those, or 76% of Canadian households, reported that they had visited a nearby park or greenspace. This is up from 72% of Canadian households who reported that they had visited a nearby park or greenspace in both 2011 and 2013.

Indicators used in this assessment

1. Percentage of Canadians who report that they take definite action to protect the environment
2. Participation in volunteer-based citizen-science monitoring programs
3. Trends in park or conservation area visitation
4. Trends in the percentage of Canadians who report that they visited parks or public greenspaces

Please describe any other tools or means used for assessing progress

In addition to the trends associated with the indicators above, additional sources of information support the assessment of progress toward Canada Target 19. Canadians place a great deal of importance on spending time in nature and participating in nature-based activities. The 2012 Canadian Nature Survey found that more than two-thirds of Canadian adults (70%) choose to spend time outdoors in order to experience nature. 89% of Canadian adults participated in at least one of over 30 different nature-based activities, with the most popular being picnicking or relaxing in nature (71% nationally), followed by reading or viewing nature media (66%); hiking, climbing, horseback riding (64%); and gardening or landscaping with plants (51%). The survey found that 24% of Canadian adults participated in nature conservation activities, and 15% of Canadians participated in citizen-science.

As part of its celebration of the 150th anniversary of Confederation, the Government of Canada offered free admission to all of Canada's National Parks, National Heritage Sites and National Marine Conservation Areas. A special Canada 150 Parks Canada Discovery Pass, granting unlimited free entry to Parks Canada's places in 2017, was made available upon request. The initiative was undertaken to encourage and assist Canadians (and others) to get out and explore the country's protected places. Between online orders and local distribution (on site and via partners), more than 8 million Discovery Passes were in circulation in 2017, with possession dominated by Canadians. Visitation for the calendar year 2017 reached 27.2 million, an 11% increase over the previous year. Associated social media campaigns (e.g., #showusyourpass) had a reach of 20 million people and showcased the pride Canadians have for their protected places.

Relevant websites, web links and files

- Households and the Environment Survey (environmental engagement summary): http://www.statcan.gc.ca/daily-quotidien/170605/dq170605a-eng.htm
- Households and the Environment Survey (environmental engagement data): https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=3810002301
- Households and the Environment Survey (parks and green spaces): https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=3810002001
- Breeding Bird Survey: http://www.bsc-eoc.org/volunteer/bbs/index.jsp?lang=EN&targetpg=index
- Christmas Bird Count: http://www.birdscanada.org/volunteer/cbc/
- eBird Canada: https://ebird.org/canada/home
- iNaturalist Canada: http://inaturalist.ca/
- 2012 *Canadian Nature Survey* summary report: http://biodivcanada.ca/default.asp?lang=En&n=2A0569A9-1
- 2012 *Canadian Nature Survey* data: https://open.canada.ca/data/en/dataset/694b9da8-1f06-4ebe-ad38-1b14bdaf756e
- Linked attachment: Canadian participation in citizen science monitoring programs: http://twk.pm/uhbt1136g7
- Linked attachment: Visitation summary for Canadian parks systems: http://twk.pm/maw4tc3fyb

Level of confidence of the above assessment

☐ Based on comprehensive evidence
☒ Based on partial evidence
☐ Based on limited evidence

Please provide an explanation for the level of confidence indicated above

While generally supporting the assessment, there are some limitations to the evidence associated with each indicator. For survey data, differences in sampling methodology are known to influence results even for statistically representative surveys. The Households and the Environment Survey comprises households in Canada's provinces but not the Territories.

Overall results for parks visitation do not distinguish between Canadian visitors (both in province and out-of-province residents) and international visitors on an annual basis, so it is possible that international visitors, rather than Canadians, had some influence on the increase in visitors to parks. However, there is evidence that domestic visitors make up the large majority of visitors to Canadian parks: on average, 80% of visitors to Canada's National Parks and National Marine Conservation Areas are Canadian. Assuming the proportion is even higher in provincial and territorial park systems, the trend suggests an increase in Canadian visits. In 2017, national parks and marine areas closest to major urban areas (within 100 km; ~1 hour driving time) experienced the largest overall increase in visitation, suggesting that Canadians may have been the driver of increased visitation at these locations.

Similarly, visitation results do not distinguish repeat visits from unique visitors; however, repeat visitation can be an indication of overall interest in protected spaces. National parks and marine areas with a heavy repeat visitor base (those with more than 60% repeat use on average) saw the largest increases in total

visitation with free admission in 2017. The success of Parks Canada's Discovery Pass initiative and its associated media reach in 2017 however, supports the conclusion that Canadians are interested in exploring and spending time in Canada's natural spaces.

Adequacy of monitoring information to support assessment

☐ Monitoring related to this target is adequate
☒ Monitoring related to this target is partial (e.g. only covering part of the area or issue)
☐ No monitoring system in place
☐ Monitoring is not needed

Please describe how the target is monitored and indicate whether there is a monitoring system in place

The survey and data collection processes noted above are used to monitor progress on this target.

Section IV. Description of the national contribution to the achievement of each global Aichi Biodiversity Target

Aichi Target 1: By 2020, at the latest, people are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably

Please describe how and to what extent your country has contributed to the achievement of this Aichi Biodiversity Target and summarize the evidence used to support this description

Initiatives aimed at educating and increasing awareness of the importance of nature among the population take place across the country targeting many audiences. Online resources which provide information about the importance of biodiversity and how people can conserve and use it sustainably include Canada's national biodiversity clearing-house mechanism, www.biodivcanada.ca, federal, provincial, territorial and many non-governmental websites.

Through the integration of biodiversity into the elementary and secondary curricula in Canada's provinces and territories, Canada's youth acquire understanding and knowledge about biodiversity, the pressures acting upon it, its importance to human health and well-being, and measures that can be taken to conserve it and use natural assets more sustainably. Knowledge and awareness among Canada's youth will contribute to a Canadian society in which people are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably.

Canadians have a high degree of awareness of the importance of nature. Results of the Canadian Nature Survey published in 2014 found that in late 2012 through early 2013 three-quarters (76%) of Canadian adults had heard of the term "biodiversity", more than two-thirds (69%) had heard of "ecosystem services", and 92% had heard of "species at risk". Three quarters (77%) of Canadians were aware that biodiversity contributes to ecosystem services and provides life support and other important benefits to people, and over 90% were aware that nature can be essential for specific services like providing clean air and water, fertile soil, places for recreation, pollination and providing raw materials. This awareness may influence a number of decisions: half of Canadians chose where they live partly to have access to nature. More than half of Canadians (57%) reported that they purchase products and services that are more environmentally friendly than their competitors' products, and 45% reported that they have adjusted their lifestyle to reduce their ecological footprint. The survey found that 24% of Canadian adults – 6.4 million people – participated in voluntary nature conservation activities, including citizen science (http://www.biodivcanada.ca/default.asp?lang=En&n=2A0569A9-1).

A 2015 national public opinion poll found that 89% of Canadians agree that preventing the extinction of wild plants and animals in Canada is important. In that poll, 82% of Canadians agreed that land owners have a moral obligation to not harm endangered plants and animals on their property and 80% believe that it is necessary for government to prevent industrial development in certain areas in order to protect endangered plants and animals (https://www.ipsos.com/en-ca/news-polls/nearly-nine-canadians-consider-preventing-extinction-wild-plants-and-animals-important).

Also in 2015 a different opinion poll of Canadian children ages 8-11 found that 85% of those surveyed said it was 'very important' to do things to protect the environment, that species extinction was the environmental issue of greatest importance to them, and 84% believed that their parents have done things to protect the environment as a result of their children's activities (https://www.ipsos.com/en-ca/canadian-kids-aged-8-11-rate-animals-becoming-extinct-environmental-issue-thats-most-important-them).

The *Ontario Biodiversity Awareness Survey* (http://sobr.ca/indicators/indicators-by-target/#510), conducted in 2014 and again in 2016, revealed the following results for the province of Ontario: 64% of respondents were aware of the term biodiversity, representing a 4% increase over 2014. Of the respondents aware of biodiversity, 58% defined it correctly and another 33% chose a partial definition of the term. More than a majority of respondents agreed (78%, 22% agree and 56% strongly agreed) that biodiversity plays an important role in maintaining their health and well-being, representing a 5% increase over 2014. The survey results suggest that awareness about biodiversity and its importance to their health is approaching the 50% target outlined in *Ontario's Biodiversity Strategy*, 2011. This may be an underestimate, given that some Ontarians who live and work with the land, including many Indigenous peoples, farmers, hunters, fishers, and others, may not use the term "biodiversity" but have a strong understanding of its importance. Given the similarity in questions, Ontario results can be compared with the country results from the UEBT Biodiversity Barometer (http://www.biodiversitybarometer.org/) that measures awareness and understanding of biodiversity.

Engaging Canadian Kids in Wildlife Conservation is a 3-year federal fund launched in 2018 for organizations to develop and deliver national-scale, regionally specific programs aimed at educating and engaging children aged 6 to 12 in Canadian wildlife conservation. Overall, this funding will educate kids about protecting Canada's biodiversity for future generations and the threats, like climate change, that impact it. More specifically, the funding will support programming that achieves the following three goals:

- Increasing kids' knowledge and awareness of Canada's wildlife, including threats to wildlife and habitat, and how to conserve and recover species at risk,
- Providing kids with opportunities to get involved in activities that help conserve nature, and
- Inspiring kids to be active stewards of the natural world.

Please describe other activities contributing to the achievement of the Aichi Biodiversity Target at the global level

Canada is also playing a significant role in contributing to the achievement of Aichi Biodiversity Target 1 globally. In particular, it founded and is co-leading the global #NatureForAll initiative, which aims to build broad-based public and cross-sectoral support and action for biodiversity conservation in Canada and globally. #NatureForAll is a rapidly-growing partnership of more than 230 organizations from close to 40 countries representing all regions of the world that aims to inspire love, support, and take action for biodiversity conservation. It is grounded in the knowledge that personal experiences and connections with the natural world provide powerful benefits for individual and societal health, well-being, and resilience and are also the foundation of lifelong support of and commitment to biodiversity conservation.

#NatureForAll partners are working together to scale up the reach and impact of successful programming that raises awareness of nature and its values and facilitates opportunities for people from all walks of life to experience and connect with nature. More than 40 examples of successful programming have been shared to date. By contributing to the achievement of Aichi Biodiversity Target 1, #NatureForAll is increasing the willingness of individuals to make the necessary changes, take action, and create the "political will" for governments to act, thus greatly facilitating the implementation of the Strategic Plan for Biodiversity and the fulfillment of the other 19 Aichi Biodiversity Targets.

Aichi Target 2: By 2020, at the latest, biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting, as appropriate, and reporting systems.

Please describe how and to what extent your country has contributed to the achievement of this Aichi Biodiversity Target and summarize the evidence used to support this description

The diverse values of biodiversity and ecosystem services are increasingly recognized in Canada at the local and national levels in development and land use planning processes. Municipal activity is illustrated in this report, Section 3, Canada Target 4 and its supporting documentation. The contributions that ecosystems make in terms of natural infrastructure are recognized in the Pan-Canadian Framework on Clean Growth and Climate Change and the major infrastructure and disaster mitigation funding programs for provincial, territorial, and municipal governments to support implementation of the framework. This natural infrastructure value is also increasingly recognized at the local level, for example in the Municipal Natural Assets Initiative described in this report, Section 2, Canada Target 13. Although the practice is not universal across Canada, some Provincial governments, such as Alberta, explicitly integrate diverse values of ecosystem services in regional land use plans and policies. Canada's federal, provincial, and territorial governments collaborated to develop and publish a detailed technical guide to ecosystem services assessment to support their abilities to analyse the diverse values of ecosystem services so that they could use this information in a wide range of policy and decision contexts (Ecosystem Services Toolkit, 2017, http://biodivcanada.ca/default.asp?lang=En&n=B443A05E-1). The federal government considers ecosystem services and biodiversity values when evaluating species for listing under Species at Risk legislation.

Statistics Canada was an early adopter of national environmental and ecosystem accounting, and to this day supports the development of the United Nations System of Environmental-Economic Accounting (SEEA). This system now includes a module on ecosystems and their services, titled SEEA *Experimental Ecosystem Accounting* (EEA). Statistics Canada contributes in many ways to the development and international adoption of this conceptual framework: by being an active member of the SEEA EEA expert working group and of the editorial committee on SEEA EEA Technical Recommendations; and by providing international training, namely in South America and in Asia.

Canada also leads by example by producing data and reports on various facets of biodiversity and by reporting on ecosystems (i.e. the ecological infrastructure), ecosystem services, beneficiaries of these services, and management efforts taken to minimise ecological impacts. These data are released as official national statistics and made publicly available via the national statistical system, and to the extent possible, interpreted alongside national accounts data.

Statistics Canada also contributes to the achievement of Aichi Target 2 by participating in international efforts (e.g. Earth Observation for Ecosystem Accounting, a.k.a. EO4EA, a Group on Earth Observation initiative) and national efforts (e.g. United States Natural Capital Initiative, by the Powell Centre of the United States Geological Survey) aimed at furthering ecosystems data availability, use and application at the international, national, and sub-national scales.

Canada has numerous mechanisms for national reporting for which the significance of biodiversity is relevant, see especially this report, Section 3, Canada Targets 1, 5, 6, 7, 8 and 9, and the Canadian Environmental Sustainability Indicators reporting system (https://www.canada.ca/en/environment-climate-change/services/environmental-indicators.html). The Federal Sustainable Development Strategy is the Government of Canada's primary vehicle for sustainable development planning and reporting. It sets out sustainable development priorities, establishes goals and targets and identifies actions to achieve them (http://www.fsds-sfdd.ca/index.html#/en/goals/)

Please describe other activities contributing to the achievement of the Aichi Biodiversity Target at the global level

As mentioned above, by providing training in national environmental accounting, Canada helps countries meet their targets. The training on ecosystem accounting includes, among others, China and East-Asian countries (Beijing 2017, Shanghai 2015); Malaysia (September 2016), Chile and South-American countries (November 2014). The training is usually sponsored by United Nations agencies.

Canada also participates in the work of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. Several Canadians are among the expert scientific authors of IPBES assessments, and one is a member of the IPBES Core Group of Experts on Values and has contributed to the development of the IPBES *Guide to the diverse conceptualizations of multiple values of nature and its benefits, including biodiversity and ecosystem functions and services* (2016).

Aichi Target 3: By 2020, at the latest, incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed in order to minimize or avoid negative impacts, and positive incentives for the conservation and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socio economic conditions.

Please describe how and to what extent your country has contributed to the achievement of this Aichi Biodiversity Target and summarize the evidence used to support this description

Examples of innovative mechanisms for conservation are illustrated in this report Section 3, for Canada Target 13. In addition, Canada has several conservation incentive programs (for current programs see: https://www.canada.ca/en/services/environment/conservation/funding.html).

Some of Canada's incentive-based programs include:

The **Canada Nature Fund** has been designed to motivate and support the efforts of Canadians whose participation is critical to achieving success in nature conservation. It will make it possible to establish protected and conserved areas, secure private land, and support terrestrial- and aquatic-species protection efforts by provinces, territories, Indigenous peoples, and stakeholders. The Canada Nature Fund will provide federal funding of $500 million over five years. Through leveraged partnership support from foundations, provinces, territories, the corporate and not-for-profit sectors, and others, it is anticipated that at least another $500 million will be raised for conservation action.

The Canada Nature Fund will have two streams: Spaces and Species. The Spaces stream will provide almost $300 million over five years toward increasing the protected and conserved areas in Canada, their connectivity, and their ecological integrity to contribute to Canada's Biodiversity Target 1 (i.e., Aichi Target 11). The Species stream will provide over $200 million over five years toward the protection and recovery of terrestrial species at risk—managed by Environment and Climate Change Canada—and aquatic species at risk—managed by Fisheries and Oceans Canada—through a shift to ecosystem-based, multi-species approaches. This funding will contribute to the protection and recovery of priority species—such as caribou and some migratory fish—the protection of priority areas, and mitigate risks to species at risk associated with priority sectors—such as forestry, agriculture, and urban development.

The overall goals of the **Habitat Stewardship Program** are to "contribute to the recovery of endangered, threatened, and other species at risk, and to prevent other species from becoming a conservation concern, by engaging Canadians from all walks of life in conservation actions to benefit wildlife." Activities must take place on private lands, provincial Crown lands, Indigenous lands, or in aquatic and marine areas across Canada. Funding under the HSP is also separated into two distinct streams: the Species at Risk Stream and the Prevention Stream. The Species at Risk Stream focuses on projects addressing the recovery of species at risk listed on Schedule 1 of the federal *Species at Risk Act* (SARA). Since its inception in 2000 and the end of March 2017, the HSP Species at Risk Stream has contributed over $176.9 million in over 2,600 projects. This investment has leveraged more than $431 million from project partners and benefited, annually, on average, 440 unique species at risk. The program has also supported the legal protection of over 193,000 hectares (ha) of land and the improvement or restoration of more than 429,000 ha of land and 3,200 km of shoreline. The Prevention Stream focuses on projects addressing

other species, beyond those listed on Schedule 1 of SARA, to prevent them from becoming a conservation concern. Between its inception in 2014 and the end of March 2017, the HSP Prevention stream has invested over $8.6 million in over 220 projects. This investment has leveraged more than $18.3 million from project partners. The program has supported the legal protection of over 1,300 ha of land and the improvement or restoration of more than 7,700 ha of land and 29 km of shoreline.

The **Aboriginal Fund for Species at Risk** (AFSAR) plays an important role in the recovery of species at risk on Indigenous lands by encouraging meaningful involvement of Indigenous peoples and communities in the implementation of SARA (https://www.canada.ca/en/environment-climate-change/services/environmental-enforcement/acts-regulations/about-species-at-risk-act.html). Funds are allocated to projects that protect habitat and contribute to the recovery of species at risk, as well as to projects that prevent other species from becoming a conservation concern. Similar to HSP, funding under AFSAR is separated into two distinct streams: the Species at Risk Stream and the Prevention Stream. Between its inception in 2004 and the end of March 2017, the AFSAR Species at Risk Stream has contributed more than $36.5 million to more than 880 projects, leveraging more than $26.9 million in matching funds from project partners for a total investment of over $63.4 million. Funded projects benefited, on average, 120 unique SARA-listed species annually. The program has also supported the legal protection of over 71,700 ha of land and the improvement or restoration of more than 13,500 ha of land and 370 km of shoreline. Since its inception in 2014 and the end of March 2017, the AFSAR Prevention Stream has invested over $2.8 million to support over 70 local conservation projects and has partnered with more than 66 different Indigenous organizations and communities. Project partners have contributed more than $1.9 million to these projects. The program has also supported the improvement or restoration of more than 4,900 ha of land and 66 km of shoreline.

The **National Wetland Conservation Fund** (NWCF) launched in 2014/15 for five years with the goal of restoring degraded or lost wetlands and enhancing the ecological function of degraded wetlands. Between September, 2014 and March 31, 2017, close to $25.5 million in federal funding was expended on 198 NWCF projects. During this same timeframe, over 2,600 hectares of wetlands and associated uplands have been restored and over 340,000 hectares of wetland and associated upland habitat have been enhanced.

Canada's **Ecological Gifts Program** provides a way for Canadians with ecologically sensitive land to protect nature and leave a legacy for future generations. Made possible by the terms of the *Income Tax Act of Canada* and the *Taxation Act* in Quebec, it offers significant tax benefits to landowners who donate land or a partial interest in land to a qualified recipient. Recipients ensure that the land's biodiversity and environmental heritage are conserved in perpetuity. The Ecological Gifts Program is administered by Environment and Climate Change Canada in cooperation with dozens of partners, including other federal departments, provincial and municipal governments, and environmental non-government organizations. Thanks to this team approach and a dedication to continuously evolving and improving, the Program has become more successful each year. Since the inception of the program in 1995 and March 31, 2017, 1,300 ecological gifts valued at over $823 million have been donated across Canada, protecting almost 184,000 hectares of wildlife habitat.

The **Natural Areas Conservation Program** (NACP) is a partnership to accelerate the rate of private land conservation and protect important natural habitat across southern Canada. The Nature Conservancy of Canada (NCC) administers the program, securing ecologically significant lands —including forests, grasslands and wetlands — with the participation of Ducks Unlimited Canada and other land trusts. Under the NACP, a federal investment of $300 million, between 2007 and March 31, 2017, has resulted in over 430,000 hectares of ecologically important habitat becoming protected and $580 million in matching contributions raised by the Nature Conservancy of Canada and its partners.

The **Recreational Fisheries Conservation Partnerships Program** supports recreational fisheries habitat restoration projects led by angling/fishing groups, conservation organizations and Indigenous groups to rebuild and rehabilitate fish habitat in Canada. The Government of Canada is investing $8.6 million in recreational fisheries habitat restoration projects across the country from 2017 to 2019. The program supports multi-partner projects at the local level aimed at restoring re compromised and/or threatened recreational fisheries habitat in order to enhance the sustainability and productivity of Canada's recreational fisheries.

The **Coastal Restoration Fund** is part of the national Oceans Protection Plan, launched in 2016. The fund provides $75 million over 5 years to support projects that help to restore coastal aquatic habitats. The recent launch of the fund was a success and funded 32 projects, totaling approximately $46.9 million. All approved projects include Indigenous involvement in their planning or implementation.

The **EcoAction Community Funding Program** provides support to non-profit organizations and community groups for projects to protect, rehabilitate, enhance and sustain the natural environment. The 2018 funding is available for new projects that engage Canadians and clearly demonstrate measurable, positive environmental results related to clean water or climate change adaptation and mitigation.

Regarding the reduction or elimination of subsidies harmful to biodiversity, Canada has committed to phase out and rationalize inefficient fossil fuel subsidies by 2025. To that end, the Government is reviewing both tax and non-tax measures at the federal level to identify and analyze measures that may be considered inefficient fossil fuel subsidies. Consistent with the commitment, eight preferential tax provisions for the oil and gas and mining sectors (including coal mining) have been or are in the process of being, phased out or rationalized.

Aichi Target 4: By 2020, at the latest, governments, business and stakeholders at all levels have taken steps to achieve or have implemented plans for sustainable production and consumption and have kept the impacts of use of natural resources well within safe ecological limits.

Please describe how and to what extent your country has contributed to the achievement of this Aichi Biodiversity Target and summarize the evidence used to support this description

For additional information on this target see content provided for Canada Targets 6, 7, 8, and 9 in Sections II and III of this report.

Forestry

Through its Sustainable Forest Management (SFM) practices, Canada ensures conservation of its forests and sustainable harvesting (production) of its forest resources.

Under provincial and territorial laws, all areas harvested on public lands are required to be regenerated using natural or artificial means (i.e. planting and seeding), or a mix of the two. Successful regeneration of harvested areas ensures that forest lands remain productive for wood fibre and continue to maintain biodiversity and the ecosystem services it underpins including carbon storage, regulating water quality and quantity, and providing wildlife habitat and recreation opportunities.

Canadian provinces and territories develop and implement science-based forest management plans that include determining Annual Allowable Cuts (AACs) to ensure that harvested wood does not exceed sustainable wood supply, which is the volume of wood that can be harvested without interfering with environmental, social, cultural, or economic objectives. Forest companies are legally required to respect AAC levels.

Canada has the world's third largest forest area with approximately 74% of Canada's managed forest lands, or 48% of Canada's total forest lands (168 million hectares) covered by an independently verified forest management certification scheme. This represents 37% of the world's certified forests. In addition to Canada's laws and policies governing forest management, sustainable forest management certification provides added assurance that a forest company is operating legally, sustainably and in compliance with world-recognized standards for sustainable forest management.

Three recognized forest certification systems are used in Canada: those of the Canadian Standards Association, the Forest Stewardship Council and the Sustainable Forestry Initiative.

The Government of Canada's policy on Green Procurement (https://www.tbs-sct.gc.ca/pol/doc-eng.aspx?id=32573) seeks to advance protection of the environment and support sustainable development by integrating environmental considerations into the procurement process. It directs federal departments and agencies to incorporate environmental considerations into decision-making for all goods and services. Departments are responsible for setting green procurement targets and including environmental criteria and specifications. As a result, suppliers have a key role to play in advancing the government's environmental agenda by providing environmentally preferable goods and services. For example, the

Government of Canada recognizes forest certification systems as a means to demonstrate that paper was sourced sustainably.

Whether through use of rigorous forest laws and regulations, third-party verification or sustainability policies, Canada's consumption of raw materials and production of processed goods must meet sustainable management standards. As an example, Canadian forest companies are obliged to adopt sustainable practices and public agencies follow green procurement policies involving use of wood products from sustainable sources, directly contributing to Aichi Target 4.

Natural Resources Canada has also developed different programs and initiatives to help reduce the environmental footprint of natural resources and other industries, including:

- Using forest science expertise of the Canadian Forest Service (CFS) to improve forest land reclamation and environmental performance in Canada's oil and gas industry, (http://www.nrcan.gc.ca/forests/industry/bioproducts/17736) while also advancing the restoration of forest landscapes (http://www.nrcan.gc.ca/forests/industry/land-reclamation/17876)
- Pulp and Paper Green Transformation Program: the projects completed under the program from 2009 to 2012 enabled Canadian mills to save more than 8.5 million GJ of energy a year from energy efficiency improvements, to decrease their emissions of greenhouse gases (GHGs) by 766,000 tonnes per year, and to decrease the impact of their operations overall on the environment by reducing the amount of water use, effluent discharge and waste sent to landfills (http://www.nrcan.gc.ca/forests/federal-programs/13141)
- Development of new bioproducts and markets (Bio-pathways): this program leveraged the interest in converting forest biomass into economically profitable and environmentally friendly products. Using wood biomass for green building products, bioenergy, biochemical and bioproducts not only reflects smart use and innovative thinking, but also responds to the growing demand worldwide for "green" products made from naturally renewable, sustainably managed sources (http://www.nrcan.gc.ca/forests/industry/tools-research/13331#phase)

Aquaculture

With respect to the role of aquaculture, Canada contributes directly to these Aichi targets. Canada's aquaculture industry is increasingly important to the national economy and accounts for 19% of Canada's total seafood production, approximately 0.04% of national GDP in 2016, as compared to 0.01% in 2015. Canada is committed to developing aquaculture in a sustainable manner that protects marine ecosystems and conserves wild fish populations. With that goal it invested $54 million in a program between 2013-2018 to enhance science research to support regulatory decision-making, streamline regulatory regime and improve transparency through public reporting. New regulations were introduced to clarify conditions under which operators may install or operate aquaculture facilities, and deposit drugs and pesticides in fish bearing waters. A public reporting system is being established to demonstrate the Canada's commitment and industry's responsibility to sustainable seafood production. Additionally, in 2018, Canada is renewing its funding at $22 million over two years to continue its support for the Aichi targets.

The industry, too, has taken initiatives that contribute to these Aichi targets. The most notable is the adoption of third party certification that validates that the industry follows responsible farming practices for producing seafood and that they meet comprehensive environmental and food safety standards.

Currently, all major salmon farming companies in Canada, as well as some mussel and feed companies, have achieved various levels of certification.

Aichi Target 5: By 2020, the rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced.

Please describe how and to what extent your country has contributed to the achievement of this Aichi Biodiversity Target and summarize the evidence used to support this description

Wetlands

Please see reporting for Canada Target 3 in Section III for information on how Canada has addressed this Aichi Target in the context of wetlands.

Forests

Deforestation is the permanent clearing of forests for other types of land uses. It differs from temporary forest cover loss caused by natural wild fires or sustainable forest management activities, including harvesting, where there is no land-use change and forest regrowth is expected.

As detailed in Canada's State of the Forest report (http://cfs.nrcan.gc.ca/pubwarehouse/pdfs/38871.pdf), the annual deforestation rate in Canada is among the world's lowest at less than 0.02% of total forest area and that rate has been declining for more than 25 years. For example, in 1990, 63,100 hectares were deforested, while in 2015 this figure dropped to 36,000 hectares. Statistical data on temporary tree cover loss within the forest land base, such as forest harvesting and silviculture activities, are reported in detail in Canada's National Forest Database.

Agricultural expansion remains the leading cause of deforestation (12,300 hectares in 2015), followed by oil and gas resource development and urbanization (9,800 and 3,200 hectares in 2015, respectively). Afforestation or the conversion of non-forest land to forest land use is not monitored nationally. Studies indicate that the area involved is very small.

In Canada, restoration has been part of forest management for many years with efforts increasing, due to species at risk habitat recovery efforts focussed on woodland boreal caribou. Forest and landscape restoration (FLR) is the process of regaining ecological functionality in deforested or degraded forest landscapes. It is an opportunity to bring degraded and unproductive lands back into a functional state.

Successful FLR:

- Reverses environmental degradation
- Improves land management and governance
- Increases the resilience of communities and landscapes
- Contributes to climate mitigation mechanism through carbon storage
- Optimizes ecosystem goods and services to meet the changing needs of society

Sustainable forest management in Canada facilitates and supports concrete restoration initiatives. Multiple national and provincial programs support FLR in Canada, such as the National Greening Program (https://treecanada.ca/reforestation-carbon-offsetting/national-greening-program/) , which encourages the mass planting of seedlings across Canada where there is a need for restoration or afforestation Under the Ontario government's 50 Million Tree Program (https://www.forestsontario.ca/planting/programs/50-

million-tree-program/), more than 24 million trees have been planted since 2007, creating more than 14,000 ha of new forests.". Similar programs exist in Manitoba, Quebec and British Columbia to respond to catastrophic natural disturbances. The BC Forest Carbon Initiative is funding projects to increase carbon sequestration through reforestation, expanded fertilization, increased planting density and improved utilization. The federal Green Construction through Wood (GCWood) Program (https://www.nrcan.gc.ca/forests/federal-programs/gcwood/20046) supports reduced greenhouse gas emissions in the manufacturing of construction materials by promoting increased use of wood products un construction projects.

Bird Habitat

The North American Bird Conservation Initiative (NABCI) aims to ensure that populations and habitats of North America's birds are protected, restored and enhanced through coordinated efforts at international, national, regional and local levels guided by sound science and effective management. It is designed to increase the effectiveness of existing and new initiatives through effective coordination, building on existing regional partnerships, such as the Joint Ventures, and fostering greater cooperation among the nations and the peoples of the continent.

In May 2016, NABCI published The State of North America's Birds 2016, the first comprehensive report assessing the conservation status of all bird species that occur in Canada, the continental United States and Mexico. In December 2016, the NABCI Committees of Canada, Mexico and the United States released a North American Vision for Hemispheric Bird Conservation, meant to guide its collaborative, international bird conservation work for the next 100 years.

While NABCI officially includes Canada, Mexico and the United States, it encourages linkages with other nations and programs in the Western Hemisphere. For example, NABCI partners are active members of the Western Hemisphere Shorebird Reserve Network which has a mission to conserve shorebirds and their habitats through a network of key sites across the Americas.

The pillars of NABCI are the four bird conservation plans – the North American Waterfowl Management Plan (NAWMP), the Shorebird Conservation Plan, the Waterbird Conservation Plan and the Partners in Flight Landbird Conservation Plan.

The North American Waterfowl Management Plan Committee is an international body that provides leadership and oversight for the activities undertaken in support of the North American Waterfowl Management Plan. The Plan Committee provides a forum for discussion of international waterfowl issues and makes policy recommendations to federal wildlife departments in Canada, the United States and Mexico. International sub-committees and advisory bodies under the Plan Committee include Science Support Team, Human Dimensions Working Group, Public Engagement Team and Harvest Management Working Group.

Aichi Target 6: By 2020 all fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem based approaches, so that overfishing is avoided, recovery plans and measures are in place for all depleted species, fisheries have no significant adverse impacts on threatened species and vulnerable ecosystems and the impacts of fisheries on stocks, species and ecosystems are within safe ecological limits.

Please describe how and to what extent your country has contributed to the achievement of this Aichi Biodiversity Target and summarize the evidence used to support this description

In 2009, Canada introduced its Sustainable Fisheries Framework (SFF) policies to guide the management of fisheries (http://www.dfo-mpo.gc.ca/reports-rapports/regs/sff-cpd/overview-cadre-eng.htm). These policies directly support Canada's efforts to achieve the target by setting out risk-based approaches to manage fisheries sustainably. In addition, in 2010, Canada introduced an annual survey to track progress to apply the SFF policies on Canada's major fish stocks: Sustainability Survey for Fisheries (http://www.dfo-mpo.gc.ca/reports-rapports/regs/sff-cpd/survey-sondage/index-en.html). The survey is the source for the two indicators used to report on progress to achieve this target. The survey results show the progress Canada is making to achieve the target.

Canada has made substantial progress to manage fishery impacts on marine benthic habitat areas through fishery closures. Many of Canada's fisheries area closures have also been identified as other effective area-based conservation measures contributing to Canada Target 1 / Aichi Target 11. More information can be found in Sections I, II and III of this report, and on Fisheries and Oceans Canada's website [http://www.dfo-mpo.gc.ca/oceans/oeabcm-amcepz/refuges/index-eng.html].

Canada has developed a plan to complete rebuilding plans for 19 priority fish stocks, which have declined to low levels (http://www.dfo-mpo.gc.ca/ae-ve/audits-verifications/16-17/work-plan-travail-eng.html). Taking action aimed at rebuilding depleted fish stocks is essential to achieve this target, as these stocks contribute to biodiversity.

Please describe other activities contributing to the achievement of the Aichi Biodiversity Target at the global level

Canada participates in multiple Regional Fisheries Management Organizations (RFMOs) to manage, conserve and protect shared fish stocks within the mandate of the RFMOs' respective conventions. In addition to the RFMOs listed on the Fisheries and Oceans Canada (DFO) website (http://www.dfo-mpo.gc.ca/international/dip-rfmo-eng.htm), Canada is a member of the North Pacific Fisheries Commission (NPFC), a cooperating party of the North East Atlantic Fisheries Commission (NEAFC), and an observer for the North Atlantic Marine Mammal Commission (NAMMCO), International Whaling Commission (IWC), and an acceding State to the Convention for the Conservation of Antarctic Marine Living Resources (CCAMLR).

Canada is also a member of the Food and Agriculture Organization of the United Nations (FAO) Committee on Fisheries (COFI), where major international fisheries and aquaculture problems and issues are examined and recommendation addressed to governments, regional fishery bodies, NGOs, fishworkers, and the international community on a world-wide basis. Though FAO-COFI, Canada has

been an active participant in the negotiation of global binding agreements on fisheries management as well as non-binding instruments such as voluntary guidelines.

Canada is in the process of ratifying the 2009 Agreement on Port State Measures Agreement to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing (PSMA). The PSMA sets global minimum standards for actions that port States must take when a foreign vessel, known or suspected to have engaged in or supported illegal, unreported and regulated (IUU) fishing, seeks to enter port to land catch or use port services.

DFO is part of the International Monitoring, Control and Surveillance (IMCS) Network, which aims to improve the efficiency and effectiveness of fisheries-related MCS activities through enhanced cooperation, coordination, information collection and exchange among national organizations/institutions responsible for fisheries-related MCS.

Canada engages states to improve fisheries management, science, and food safety globally, all of which enables these states to benefit from their resources in a sustainable manner. In recent years, Canada has worked with Senegal, specifically through exchanges of information and training related to management and licensing, data collection and analysis, conservation and protection, and seafood processing. Additionally, Canadian officials have engaged Greenlandic counterparts to build Greenland's capacity for fisheries monitoring, surveillance, and control. This engagement has occurred through exchanges of information and site visits.

Aichi Target 7: By 2020 areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity.

Please describe how and to what extent your country has contributed to the achievement of this Aichi Biodiversity Target and summarize the evidence used to support this description

Agriculture

Canada's contribution to this target with respect to agriculture is reflected in the actions, which contribute to Canada Target 7, described in sections II and III of this report. Agriculture and Agri-Food Canada has undertaken significant steps to better assess the relationship between agriculture and wildlife habitat availability on farmland in Canada. Specifically, AAFC has recently developed a national, earth observation based agri-environmental indicator (AEI) to determine potential habitat availability for terrestrial vertebrates. This AEI utilizes yearly earth observation (AAFC Annual Crop Inventory) for quicker reporting turnover as compared to previous methodologies that relied on the Canadian Census of Agriculture (every 5 years). This allows Canada to better track land cover (habitat) change and its potential impact on wildlife at the species, guild or multi-species level.

Aquaculture

With respect to the role of aquaculture, Canada contributes directly to these Aichi targets. Canada's aquaculture industry is increasingly important to the national economy and accounts for 19% of Canada's total seafood production, approximately 0.04% of national GDP in 2016, as compared to 0.01% in 2015. Canada is committed to developing aquaculture in a sustainable manner that protects marine ecosystems and conserves wild fish populations. With that goal it invested $54 million in a program between 2013-2018 to enhance science research to support regulatory decision-making, streamline regulatory regime and improve transparency through public reporting. New regulations were introduced to clarify conditions under which operators may install or operate aquaculture facilities, and deposit drugs and pesticides in fish bearing waters. A public reporting system is being established to demonstrate the Canada's commitment and industry's responsibility to sustainable seafood production. Additionally, in 2018, Canada is renewing its funding at $22 million over two years to continue its support for the Aichi targets.

The industry, too, has taken initiatives that contribute to these Aichi targets. The most notable is the adoption of third party certification that validates that the industry follows responsible farming practices for producing seafood and that they meet comprehensive environmental and food safety standards. Currently, all major salmon farming companies in Canada, as well as some mussel and feed companies, have achieved various levels of certification.

Forestry

As reported in the State of Canada's Forest report (http://cfs.nrcan.gc.ca/pubwarehouse/pdfs/38871.pdf), Canada has approximately 347 million hectares of forest land, representing roughly 9% of the world's forests. Of this forest area, 226 million hectares are considered to be managed, while the remaining 35% of Canada's forest land is considered unmanaged. There is little human activity and no commercial harvesting within Canada's unmanaged forests.

Over 91%, or 206 million hectares, of Canada's managed forests have a long-term management plan in place. Additionally, approximately 74% of Canada's managed forest lands, or 48% of Canada's total

forest lands (167,797,442 hectares), were covered by an independently verified forest management certification scheme in 2016. Between 2011 and 2016, Canada's certified forest area increased by 11%. In 2011, 43% of Canada's forest lands (150,567,044 hectares) were covered by a certification scheme. This accounted for 66% of all managed forest lands.

Please describe other activities contributing to the achievement of the Aichi Biodiversity Target at the global level

Forestry - International Model Forest Network

Canada developed the Model Forest concept in the early 1990's. A Model Forest is typically described as both a geographic area (such as a watershed) and a partnership-based approach to the sustainable management of forests and the larger landscapes that surround them. It is a working landscape of forests, farms, protected areas, rivers and towns. The approach is rooted in a flexible and inclusive governance system that combines the social, environmental and economic needs of local communities with the sustainability of large landscapes. The partnership defines what sustainability means to them, develops a common vision for their landscape, negotiates a strategic plan, and then works together to realize that plan.

Model Forests occupy a middle ground between policy and practice. Decision–makers are key partners so that best practices can be shared beyond the Model Forest boundary. National or sub-national priorities can also be tested in a Model Forest before scaling up.

Today, there are 71 Model Forests in 31 countries covering an area of more than 100 million hectares, the majority in the developing world. All are linked through membership in the International Model Forest Network. The Network exists to facilitate knowledge exchange and the sharing of best practices between members (whether North-South, North-North or South-South) to "speed" up implementation of sustainable forest management. A small secretariat housed at Natural Resources Canada's Canadian Forest Service oversees day-to-day operation of the Network.

Model Forests work to translate national and global sustainable development priorities and commitments into practice over time in an integrated manner, often by engaging those who may be the most vulnerable to social, environmental or economic pressures, including women and Indigenous peoples. Many Model Forests actively work on issues of biodiversity conservation, sustainable consumption and production, protection and restoration of ecosystem services, and sustainable land and watershed management that directly contribute to multiple Aichi Targets and do so by applying traditional knowledge and scientific research. Case studies of Model Forest contributions to the Aichi Biodiversity Target are documented in UNEP/CBD/SBSTTA/20/INF/41. For additional information see www.imfn.net.

Forest commodities and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)

Canada is a signatory to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). Under this Convention, Canadian forest interests include a focus on addressing illegal harvest and illegal international trade in forest commodities, and on development of CITES regulations that support legal and sustainable international trade.

The Wild Animal and Plant Protection and Regulation of International and Interprovincial Trade Act (WAPPRIITA) is the legislative vehicle by which Canada meets its obligations under CITES. The purpose of WAPPRIITA is to protect Canadian and foreign species of animals and plants that may be at risk of overexploitation due to illegal trade and also to safeguard Canadian ecosystems from the introduction of species considered to be harmful. It accomplishes these objectives by controlling the international trade and interprovincial transport of certain wild animals and plants, as well as their parts and derivatives. WAPPRIITA also makes it an offence to transport illegally obtained wildlife between provinces and territories or between Canada and other countries.

Canada also has formal and informal forest-related agreements with the People's Republic of China, the Republic of Korea, Chile, Mexico, Indonesia and others. Several of these are driven by a need to share wildland fire resources, or to build capacity for detecting and monitoring forest fires. Estimating the carbon stored in trees is another Canadian scientific advancement available to all interested parties.

Canadian contributions to forest-related multilateral initiatives contributing to the achievement of the Aichi Biodiversity Target at the global level include the following:

1. Global Environment Facility

Canada is the sixth largest contributor to the GEF, having contributed US$875 million to date. The GEF supports developing countries to meet their environmental obligations under a number of multilateral environmental agreements, including the Convention on Biodiversity. The GEF provides funding support for biodiversity projects, particularly in the forestry sector, and helps countries meet the 20 Aichi Biodiversity targets. To date, the GEF has invested over US$3.5 billion in approximately 1,300 projects across 155 countries for the conservation of biodiversity, leveraging more than US$10 billion in additional financing from partners.

As of 2018, the GEF has a US$250 million Sustainable Forest Management (SFM) Strategy, which aims to achieve a range of environmental benefits, including conserving biodiversity and improved forest management through a cross-sectoral and landscape-level approach, and promote stakeholder engagement, including with Indigenous communities, civil society, the private sector, and local communities.

2. Green Climate Fund

Canada has pledged C$300 million to the Green Climate Fund (GCF) and is currently the tenth largest contributor to the GCF. By supporting the GCF, Canada helps to promote low-emissions and climate-resilient development pathways by providing support to developing countries. The GCF has a strong concern with biodiversity and the ecosystem services that it provides for addressing climate change. The resilience of ecosystems and ecosystems services is one of its eight strategic results areas, while its investment criteria include sustainable development, encompassing environmental co-benefits such as biodiversity.

3. Forest Carbon Partnership Facility

Canada is the 4th largest donor to the Forest Carbon Partnership Facility (FCPF), with a C$40 million contribution to its Readiness Fund and C$5 million to its Carbon Fund, two separate but complementary

funding mechanisms of the Facility. The FCPF is a global partnership of governments, businesses, civil society, and Indigenous peoples, focused on reducing emissions from deforestation and forest degradation, forest carbon stock conservation, the sustainable management of forests, and the enhancement of forest carbon stocks in developing countries (REDD-plus). The FCPF contributes to forest biodiversity by supporting the conservation and sustainable use of forests. Together the two funds have raised approximately US$1.3 billion to date.

4. BioCarbon Fund Technical Assistance and Capacity Building Trust Fund

In 2011, Canada contributed C$4.5 million to the BioCarbon Fund Technical Assistance and Capacity Building Trust Fund for projects that will continue to receive funding until 2020. These Funds contribute to biodiversity by supporting a landscape approach to reduced greenhouse gas emissions and by improving the livelihoods of communities near forests.

5. Bilateral Support

Canada also provides bilateral support for forestry initiatives in developing countries. For example, in Indonesia, Canada provided over $9 million to secure sustainable livelihoods for Sulawesi's smallholder farmers, including women, through forestry and agroforestry. To date, the project has improved the sustainable management of over 780,000 hectares of agroforestry, agriculture, and forestry systems and increased income for over 630,000 people (over half are women) as a result of adopting the project's promoted technologies. Canada has also provided nearly $18 million for forestry and horticulture producers in Senegal through innovation, entrepreneurship and the development of the provision of quality services. To date, the project has directly supported 20,575 producers, introduced research and development programs, and performed market analyses and technical production manuals.

Aichi Target 8: By 2020, pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity.

Please describe how and to what extent your country has contributed to the achievement of this Aichi Biodiversity Target and summarize the evidence used to support this description

Activities and efforts to meet Canada Target 10 represent Canada's contribution to the achievement of Aichi Target 8 specifically for freshwater. Details can be found in Sections II and III of this report.

For air pollution, Canada is working with provinces and territories to continue to implement the Air Quality Management System (AQMS), a collaborative system that includes establishing Canadian Ambient Air Quality Standards (CAAQS) for key pollutants, developing and implementing industrial emissions requirements, managing air sheds that traverse provincial and territorial boundaries, and reporting to Canadians on the State of the Air. Work completed through the AQMS will continue to improve air quality, the health of Canadians, and the environment.

The Government published CAAQS for fine particulate matter and ozone in 2013, ambient air quality standards for nitrogen dioxide and sulphur dioxide in fall 2017, and has launched a review of the standards for ozone. To address emissions of harmful air pollutants, the government has published the Multi-Sector Air Pollutants Regulations (MSAPR) and a number of other non-regulatory instruments. An ultimate outcome of the Addressing Air Pollution Horizontal Initiative (AAPHI) is that the adverse impacts on human health and ecosystems are reduced.

Biodiversity is affected by acid deposition and nutrient imbalance in ecosystems. Air emissions of sulphur oxides, nitrogen oxides, and ammonia can contribute to these adverse ecosystem effects. The effects of acid deposition are measured and modeled by Environment and Climate Change Canada (ECCC) considering the critical loads of acidity, which is the amount of acid precipitation that an ecosystem can endure before long-term harmful effects occur. Critical loads are available from long-term measurements at seven sites across Canada, and have been modeled for the country. Actions taken to date have led to a decreasing or stable trend in received acid deposition at each of the monitoring stations. However, despite the decrease in acid deposition, exceedances of critical loads continue to occur at least at five locations in eastern Canada, and modeling results indicate exceedances in several regions across the country.

Aichi Target 9: By 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment.

Please describe how and to what extent your country has contributed to the achievement of this Aichi Biodiversity Target and summarize the evidence used to support this description

Canada's contribution to this target is reflected in the actions, which contribute to Canada Target 11, described in sections II and III of this report. Canada works both domestically and with international partners to prevent the introduction and the spread of invasive alien species (IAS). Several federal agencies in Canada play a strong role in the prevention of introduction, establishment and spread of IAS within Canada but also to other countries through import controls, export certification, in risk assessment and analysis, and establishing common standards.

The Canadian Food Inspection Agency's (CFIA) Plant Resources Program is intended to ensure that the risks presented to the Canadian plant resources from imported shipments are mitigated, domestic plants and plant products are compliant with Canadian regulations, Canadian exports of plants and plant products meet the regulatory requirements of the importing country, confirmed introductions of quarantine pest in Canada are contained and risk-mitigated, system approaches are in place to prevent and respond to pest risk and Canadian positions are reflected in international standards. These objectives are achieved through sound legislation, regulation and programs, effective inspection activities, robust science and evidence-based decision-making and collaborative partnerships. Canada has conducted several activities that contribute to the achievement of this target, such as risk assessment, scientific research, outreach and education and international cooperation.

The CFIA's Invasive Plants program continues to analyse the risks associated with plants as pest and regulate their import and domestic movement. For example, a risk management document for *Arundo donax* was developed and consulted on by stakeholders that resulted in the recent regulation of this invasive plant under the Plant Protection Act in February 2018.

Other CFIA activities and initiatives include:

- Outreach and awareness geared towards importers, exporters, industry, travellers and the general public on the impacts of plant pests, the pathways of introduction, what can be done to protect Canada's plant resources, understanding the connection between human activity and the impact on the environment e.g. Don't Move Firewood campaign. The Don't Move Firewood Campaign is one example of a collaborative project being expanded on with the Canadian Council on Invasive Species.
- Work is also underway with the Canadian Council on Invasive Species on other campaigns targeting the horticulture industry by developing best practices on how to reduce the sale of invasive ornamental plants.
- Partnerships and collaboration as invasive alien species are a shared responsibility. For example, the CFIA collaborates with the USDA on the Asian gypsy moth vessel certification program to keep the risk of this pest at origin. The CFIA also collaborates with the U.S., Australian and New Zealand on approaches to reduce the movement of plant pests through e-commerce. The CFIA and the Animal and Plant Health Inspection Service in the U.S. are working with industry on the North American Sea Container Initiative to minimize plant pest risks associated with shipping containers.
- International negotiations on phytosanitary standard setting, regulatory cooperation, market access and resolutions for scientific and technical issues in international fora such as the International Plant Protection Convention, North American Plant Protection Organisation and

Quadrilateral Countries working groups, panels and discussions and bilateral or multi-lateral trade negotiations.

The Canada Border Services Agency (CBSA) also has a food, plant and animal mandate and delivers some elements of the CFIA's mandate at the border. The work currently includes:

- Inspection of wood packaging material at marine ports, inspection of goods for the presence of soil, referral of other high risk products to the CFIA, and identification of regulated goods;
- Export certification of Canada's food, plants and animals and associated products help to prevent the transport of pests to other countries and maintain access to international markets;
  Work with U.S. and domestic partners on mitigating the risk to Canada's plant resources posed by shipments that transit Canada from a foreign origin to a foreign destination. This includes field visits, information gathering, consultations and the development of an in-transit program;

The CBSA also addresses aquatic invasive species. For example, the CBSA works closely with federal officials, as well as provincial and territorial authorities, to stop shipments of live Asian carps from entering Canada. Travelers may also be refused entry into Canada or required to follow decontamination and/or quarantine procedures of towed watercrafts if the presence of zebra and/or quagga mussels is suspected.

The government of Canada supports a national science program on the development of biological control agents (BCA) as mitigation strategies to control invasive alien species (plants, insects, fungi, bacteria, and viruses). Canada also supports proper planning and implementation of biological control programs and provides substantial initial investment for exploration, risk analysis and quarantine facilities as well as sustainable long-term funding to support mass rearing and redistribution of biological agents and post-release monitoring and surveillance. Canada fully engages the State Authorities (e.g. Agriculture and Agri-Food Canada) for the management of pests and pathogens and of appropriate State Regulators (e.g. Canadian Food Inspection Agency) responsible for the release decisions and relevant stakeholders. Canada, through informal regulatory interaction and the North American Plant Protection Biological Control Expert Group, informs Mexico and the United States (potentially impacted countries) and consults with them prior to any release to inform them of potential benefits and risks of a biological control agent. Canada is a lead internationally in the development of BCA particularly to mitigate risks that threaten agroecosystems. The work is being performed in collaboration with the Centre for Biosciences and Agriculture International (CABI) comprising 58 member countries.

There are a number of public awareness and engagement campaigns to continue to try and prevent the spread of invasive species along high priority pathways, like Clean Drain Dry (targeting boaters and aquatic invasive species), Play Clean Go (targeting outdoor recreationists and terrestrial invasive species), Don't Let it Loose (targeting the pet trade, cultural release and aquatic invasive species) and the Spotters Network (to engage Canadians in reporting invasive species). These initiatives contribute to preventing IAS introduction and spread particularly within North America.

Please describe other activities contributing to the achievement of the Aichi Biodiversity Target at the global level

Canada collaborates with key international phytosanitary organizations and trading partners to reduce risks of IAS introduction from imported products, and maintain access to foreign markets for Canadian exports through the development and implementation of harmonized standards and guidelines. Increased international engagement, cooperation and awareness of invasive species and compliance with policies and regulations are integral to ensuring that invasive species are managed at a global scale.

Canada has identified ballast water as a priority pathway for addressing the introduction of aquatic invasive species. Canada has had a robust ballast water regulatory regime in place since 2006 that sets standards for ballast water exchange and ballast water treatment. In 2010, Canada acceded to the *International Convention for the Control and Management of Ships' Ballast Water and Sediments 2004* (the Convention). The Convention, which will significantly reduce the risk posed by the ballast water pathways of greatest concern, entered into force on September 8, 2017.

Aichi Target 10: By 2015, the multiple anthropogenic pressures on coral reefs, and other vulnerable ecosystems impacted by climate change or ocean acidification are minimized, so as to maintain their integrity and functioning.

Please describe how and to what extent your country has contributed to the achievement of this Aichi Biodiversity Target and summarize the evidence used to support this description

Canada's contribution to this target is reflected in the actions which contribute to Canada Target 5, described in sections II and III of this report.

Aichi Target 11: By 2020, at least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes.

Please describe how and to what extent your country has contributed to the achievement of this Aichi Biodiversity Target and summarize the evidence used to support this description

Canada's contribution to this target is reflected in the actions which contribute to Canada Target 1, described in sections II and III of this report. Major new funding to support domestic achievement of this target is summarized in this section in the context of Aichi Target 3.

Canada is contributing toward Aichi Target 11 through the establishment of protected areas and OECMs and through its commitment to meet Canada Target 1 (17% of terrestrial areas and inland water and 10% of marine and coastal areas). These areas are included in the overall percent coverage of Canada's conserved territory and are directly contributing towards the Canada Target 1 and Aichi Target 11. Canada's data are updated annually in the World Database on Protected Areas (WDPA).

Please describe other activities contributing to the achievement of the Aichi Biodiversity Target at the global level

The International Union for the Conservation of Nature (IUCN), World Commission on Protected Areas (WCPA), is a leading partner in developing the standards, guidelines and criteria to support global attainment of Aichi Target 11. Canadian experts are prominent contributors to these IUCN efforts and the Government of Canada has often provided funds to further these IUCN efforts. Three examples are provided for illustrative purposes:

i) WCPA developed the Global Standards for the Identification of Key Biodiversity Areas, 2016 (https://portals.iucn.org/library/node/46259). Through setting the criteria and methodology for identification of sites that contribute significantly to the global persistence of biodiversity, these standards provide a foundation for identification of new protected areas. This exercise was partly funded by the Government of Canada, co-Chaired by a Canadian scientist, and drew on the expertise of many Canadians throughout the consultation process. The Government of Canada will continue to support this work and application of the Key Biodiversity Areas standard going forward;

ii) The WCPA Task Force on "Other Effective area-based Conservation Measures (OECM)" has held workshops around the world, including two in Canada, to support the development of criteria and standards to enable countries to report on OECMs as a component of attaining Aichi Target 11. Many Canadian experts, both inside and outside of government, participated in this process, the results of which will inform the discussions at CBD meetings in 2018.

iii) WCPA Protected Areas Climate Change Specialist Group (PACCSG) is co-chaired by a Canadian. PACCSG has developed guidelines that articulate essential elements for climate change adaptation planning and implementation (Adapting to Climate Change; Guidance for Protected Areas Managers and Planners: https://portals.iucn.org/library/node/46685), which was co-authored by a Canadian) and is currently working on Policy and Guidelines for

Climate Change Mitigation in Protected Areas (which will also be co-authored by a Canadian). Both of these guidelines support the effective management of protected areas, an important component of Aichi Target 11.

Aichi Target 12: By 2020 the extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained.

Please describe how and to what extent your country has contributed to the achievement of this Aichi Biodiversity Target and summarize the evidence used to support this description

Work has been ongoing on different levels, first through support and funding provided to the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), the responsible authority for assessing the conservation status of wildlife species that may be at risk of extinction in Canada.

Following recommendations from COSEWIC, the federal government consults with concerned provincial and/or territorial ministers, relevant wildlife management boards and the public to consider many factors, including possible social and economic implications of listing the species. The federal government then decides whether to add the species to the List of Wildlife Species at Risk (Schedule 1 in the federal Species at Risk Act). Once a species is listed, the provisions under the federal *Species at Risk Act* (SARA) apply to protect and recover the species. Once listed, there are prohibitions against the killing, harming, harassing, capturing, taking, possessing, collecting, buying, selling or trading of individuals of endangered, threatened and extirpated species in Schedule 1 of SARA. SARA also contains a prohibition against the damage or destruction of their residences (e.g. nest or den).

SARA also requires recovery strategies for all endangered species. Recovery strategies identify what needs to be done to stop or reverse the decline of a species. Each recovery strategy sets goals and objectives, identifies critical habitat to the extent possible, and describes the research and management activities that are needed. Strategies are prepared by the federal government in cooperation and consultation with provincial and territorial governments, wildlife management boards, National Indigenous Organizations and stakeholders. These strategies may cover more than one species which occur in the same geographic area or ecosystem, or which have similar threats.

Under SARA, agreements or permits may be issued to authorize a person to engage in an activity affecting a listed wildlife species, any part of its critical habitat or its residences. Agreements or permits may be entered into or issued for the following purposes: 1) the activity is scientific research relating to the conservation of the species and conducted by qualified persons; 2) the activity benefits the species or is required to enhance its chance of survival in the wild; or 3) affecting the species is incidental to the carrying out of the activity.

The Habitat Stewardship Program (HSP) is part of Canada's national strategy for the protection of species at risk. The overall goals of the HSP are to contribute to the recovery of endangered, threatened, and other species at risk, and to prevent other species from becoming a conservation concern, by engaging Canadians from all walks of life in conservation actions to benefit wildlife. Since April 1, 2013 and up to the end of March 2016, the HSP invested just under $36.7 million to support more than 500 local species at risk conservation projects, benefitting on average more than 310 species at risk each year. Every year, on average, 188,000 hectares are conserved through direct actions taken by landowners, land managers, or conservation agencies.

Finally, Canada works to lead and support numerous activities to support the recovery of species at risk, including research projects, education and awareness, habitat restoration and enhancement initiatives, monitoring, and assessment, as well as protection of critical habitat.

For examples of the level activities done on yearly basis, please see the SARA Annual Reports at: http://www.sararegistry.gc.ca/document/default_e.cfm?documentID=3043&submit=View

Please describe other activities contributing to the achievement of the Aichi Biodiversity Target at the global level

The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) regulates legal international trade in specimens of species of wild fauna and flora to ensure that international trade species is not detrimental to their survival. Canada is very active in the work of CITES to help ensure sustainable trade in species. Canada is the Chair of the CITES Standing Committee and the Chair of the CITES Plants Committee. Canada provides additionally contributes to CITES decision-making through participation and leadership in key working groups that discuss and provide advice on implementation of the Convention. This includes contributions in past discussions to ensure the CITES Strategic Plan contributes to, and is coherent with, the Aichi Targets, including Aichi Biodiversity Target 12. Canada also is Chair of the Strategic Vision Working Group to develop an updated Strategic Plan that will align with the 2030 Agenda for Sustainable Development, its Sustainable Development Goals and Targets.

Aichi Target 13: By 2020, the genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives, including other socio-economically as well as culturally valuable species, is maintained, and strategies have been developed and implemented for minimizing genetic erosion and safeguarding their genetic diversity.

Please describe how and to what extent your country has contributed to the achievement of this Aichi Biodiversity Target and summarize the evidence used to support this description

Canada's domestic and global activities to maintain the diversity of these genetic resources are inseparable. Countries are interdependent for genetic resources for food and agriculture, *inter alia* because of their biological nature and the high degree of human management. It is universally acknowledged that no one country can preserve all the genetic diversity of all the crops and animals they need for all time. International cooperation is therefore essential in order to meet domestic needs. Domestic activities are undertaken in Canada to implement global decisions, and Canada's global activities are taken with an eye to satisfying domestic needs.

Canada joined the Commission on Genetic Resources for Food and Agriculture ("the Commission", http://www.fao.org/nr/cgrfa/cgrfa-home/en/) in 1989, within the United Nations Food and Agriculture Organization (FAO). Since 2004, Canada has been a Party to the legally binding *International Treaty on Plant Genetic Resources for Food and Agriculture* ("the Treaty", http://www.fao.org/plant-treaty/en/). Agriculture and Agri-Food Canada is the lead department for the Government of Canada in both entities.

Genetic diversity of cultivated plants and their wild relatives, and of domesticated animals, is maintained in genebanks which are part of Agriculture and Agri-Food Canada's genetic resources programs:

- For plants: *Plant Gene Resources of Canada (PGRC,* www.agr.gc.ca/pgrc-rpc*):*
    - Established in 1970
    - Saskatoon Research and Development Centre preserves all seed germplasm in central storage units, and maintains the Genetic Resource Information Network-Canadian Version (GRIN-CA) database management system for Canadian plant germplasm holdings
    - Canadian Clonal Genebank (CCGB), located at the Harrow Research and Development Centre (Ontario) preserves germplasm of tree fruits and berries
    - Canadian Potato Gene Resources (CPGR), located at the Fredericton Research and Development Centre (New Brunswick) preserves potato germplasm
    - PGRC's holdings currently total 110,444 accessions covering 96 botanical families, 258 genera and 1,036 botanical species
    - Almost all the plant genetic resources are part of the Treaty's Multilateral System of Access and Benefit-Sharing. All the genebanks distribute samples for research, breeding and educational purposes.
    - Over the past three years, PGRC distributed 22,846 seed samples to clients in 33 countries. A total of 335 orders were filled and 80% of the seed samples were shipped to Canadian genebank clients. PGRC provided these seed samples with about 100 seeds per accession free of charge and for shipments abroad, phytosanitary certificates were obtained from the Canadian Food Inspection Agency.
    - All seed shipments are made under the conditions of the Standard Material Transfer Agreement of the International Treaty on Plant Genetic Resources for Food and Agriculture and are reported to the Treaty's Secretary.

    - The main groups requesting seed germplasm from PGRC are, in decreasing order: research for evaluation, molecular research, private and public plant breeding, educational institutions and individuals.
    - Regeneration of accessions is combined with characterization for genetic, phenotypic, chemical and disease resistance traits. About 3,000 accessions are regenerated and agro-botanically characterized each year
    - Active collaboration with the civil society organization *Seeds of Diversity Canada* (Memorandum of Understanding)
- For farm animals: *Canadian Animal Genetic Resources (CAGR, www.agr.gc.ca/eng/?id=1297780434818):*
    - Established in 2016, integrates Canadian conservation activities with those at the global level, in particular with the Commission on Genetic Resources
    - Cryopreserves domestic livestock and poultry to estimate genetic diversity and for purposes of conservation
    - Currently has 250,000 doses of cryopreserved animal germplasm (semen, embryos or oocytes) covering domestic (bovine, porcine, equine, ovine, and caprine) and some semi-domestic (elk, deer, bison) farm and food animals
    - Collaborates with the Canadian livestock and poultry industries, Provincial and Federal governments, and international stakeholders

The Canadian Collection of Fungal Cultures (CCFC), an internationally recognized culture collection maintaining >17,000 living cultures, representing >7,500 species including many ex-Type cultures (defines a species). The CCFC is the largest and a unique collection (repository and distributor) for fungal genetic resources in Canada. The primary focus is plant pathogenic and mycotoxigenic fungi and related species from Canada and other countries that may have potential as invasive species, and potentially beneficial fungi that may enhance Canadian agricultural or economic productivity. The CCFC routinely receives > 150 requests for living cultures and > 50 requests for information or preservation protocols each year. Generally, > 500 strains per year are distributed or received and ongoing curation, evaluation, preservation activities affect over 600 strains per year. Import permits from CFIA or a letter of transfer are obtained for all culture distributions or acquisitions of foreign material (non-Canadian).

Please describe other activities contributing to the achievement of the Aichi Biodiversity Target at the global level

In 2014, the Commission adopted *Genebank Standards for Plant Genetic Resources for Food and Agriculture*. Canada is an active participant in ongoing international work to develop guidance on how to use these standards to monitor genebank activities.

No technology currently exists to provide a direct reading of the genetic diversity of the entire genomes of thousands of races, varieties and ecotypes of plant and animal genetic resources for food and agriculture. As a result, it is necessary to use proxies.

The Commission on Genetic Resources has produced reports on the State of the World's plant and animal genetic resources for food and agriculture. Global Plans of Action (GPAs) were developed from these for both plants and animals. They were adopted by governments through the FAO Conference. The GPAs represent the full slate of activities required to maintain and use genetic resources for food and agriculture. Governments also approved sets of indicators for implementation of the GPAs. Canada's domestic activities seek to manage genetic resources for food and agriculture consistent with these indicators and Canada has reported to the Commission on implementation.
During its Sixteenth regular session in Jan-Feb 2017, the Commission was informed that Composite Indices showing progress towards three higher order plant genetic resources targets at national, regional and global levels would be published.

In the report of its Sixteenth session, the Commission requested FAO to continue contributing to the development and use of international targets and indicators related to genetic resources for food and agriculture, including to the work of the Inter-Agency Expert Group on Sustainable Development Goal Indicators, with a view to ensuring consistency and coherence among relevant fora and processes and avoiding duplication of reporting.

Wild relatives of cultivated plants are maintained incidentally in parks and other protected areas, in farmers' fields, and in botanical gardens. Their geographical distribution is sometimes well known, but their genetic diversity is very rarely studied. There is no current coordinated strategy aimed at *in situ* maintenance of genetic diversity for wild relatives of cultivated plants.

Canada has reported on its implementation of Sustainable Development Goal 2, Target 5 (Note 1). There are two parts to this Target: 2.5.1 (Note 2) and 2.5.2 (Note 3). Canada has reported through two mechanisms: (1) the FAO, as the lead global agency for monitoring implementation of 2.5.1, and (2) Statistics Canada, which is implementing a Sustainable Development Goals dashboard for the Government of Canada.

Note 1: By 2020, maintain the genetic diversity of seeds, cultivated plants and farmed and domesticated animals and their related wild species, including through soundly managed and diversified seed and plant banks at the national, regional and International levels, and promote access to and fair and equitable sharing of benefits arising from the utilization of genetic resources and associated traditional knowledge, as internationally agreed

Note 2: Number of plant and animal genetic resources for food and agriculture secured in either medium or long-term conservation facilities

Note 3: Proportion of local breeds classified as being at risk, not-at-risk or at unknown level of risk of extinction

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Aichi Target 14: By 2020, ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and well-being, are restored and safeguarded, taking into account the needs of women, Indigenous and local communities, and the poor and vulnerable.

Please describe how and to what extent your country has contributed to the achievement of this Aichi Biodiversity Target and summarize the evidence used to support this description

Please see in this report, Section III, Canada Target 3 for content pertaining to wetlands. Please also see Section VI, Canada Target 3 for additional content on work related to conservation of wetlands by, and in partnership with, Indigenous communities.

Please describe other activities contributing to the achievement of the Aichi Biodiversity Target at the global level

Since 2010, the Government of Canada has averaged expenditures of approximately $133 million annually on water initiatives, including for the provision of clean water and agricultural water resources. This does not include humanitarian assistance, which often has significant water components. Seventy per cent of Canada's bilateral funding for water initiatives is spent in Sub-Saharan Africa, while nearly 20% is spent in the Middle East. Key multilateral partners include UNICEF, World Bank, African Development Bank and the Global Environment Facility. Examples of key investments in water management include:

- $39 million in support for the development of water projects in **Africa** through the African Water Facility. This Facility has leveraged more than $1.5 billion over 10 years in project finance to help:
    - 6.3 million people access improved sanitation;
    - 5.98 million people access improved drinking water sources; and
    - 9,500 farmers benefit from irrigation and improved water and land management practices.
- $13 million from 2010-2016 to support 28,500 families in 160 of the most at-risk communities of **Honduras** in a project delivered by Care Canada. This initiative contributed to 19 watershed action plans and the creation of watershed communities where women occupy 62% of decision-making positions.
- $12 million from 2014-18 for an initiative in **Syria** for the construction of a water treatment plant and rehabilitation of three water pumping units and a water treatment facility which are now supplying 150,000 people with access to clean drinking water. Both residents of the district and internally-displaced persons are benefitting from the water supply, preventing possible tensions between the host community and the displaced persons in an environment where vital resources, especially water, are often scarce.
- $5 million, through the Building Resilience in Most-affected Communities in **Iraq** project, to improve water services and train municipal authorities. This 2015-2019 project has brought safe water to 285,000 internally displaced persons and host community residents. These actions helped reduce tensions caused by population displacements in northern Iraq and enhanced the resilience of communities.

- $5 million to support efforts in **Jordan** to improve water security, with a focus on the role of women in water management. This 2015-2017 project has delivered 12 community engagement workshops that 478 women attended.
- $2.65 million in **Cambodia** from 2013-2015 to improve the resilience of agriculture to fluctuations in freshwater availability, in a project delivered through the Canadian Climate Adaptation Fund (CCAF) at the United Nations Development Program. This funding has increased local families' access to water for domestic and agricultural use by developing small-scale water infrastructure, including solar pump systems and rain water harvesting tanks, reaching 18,000 households in 80 villages.

The Ramsar Convention on Wetlands is an international treaty that provides the framework for the conservation and wise use of wetlands and their resources, including the designation of Wetlands of International Importance, also known as Ramsar sites. The Government of Canada provided financial support to the Ramsar Secretariat in 2015 and 2017 for the participation of delegates from developing countries to the Conferences of Parties and preparatory regional meetings.

As reported in the 2018 National Report to the Ramsar Convention (https://www.ramsar.org/search?f%5b2%5d=type%3Adocument&f%5b0%5d=field_tag_countries%3A173&f%5b1%5d=field_docu5794%20ment_type%3A532), Canada is also providing support for wetland conservation and management support to other countries. Examples include:

- The Agricultural Wetland Research Network through the International Institute for Sustainable Development, which is based on Canada, has research and information sharing partnerships with institutions in Israel, Paraguay and Mexico.
- The University of Saskatchewan is working with national and international partners to investigate hydrological and ecological responses in wetlands to changing environmental conditions for Northern climates as part of the changing cold regions network through participation in international projects.
- Canada's International Development Research Centre has supported Wetlands International South Asia and the Chilika Development Authority to work with stakeholders and organizations for assessing how people and ecosystems are vulnerable to climate change in coastal hotspots.

Aichi Target 15: By 2020, ecosystem resilience and the contribution of biodiversity to carbon stocks has been enhanced, through conservation and restoration, including restoration of at least 15 per cent of degraded ecosystems, thereby contributing to climate change mitigation and adaptation and to combating desertification.

Please describe how and to what extent your country has contributed to the achievement of this Aichi Biodiversity Target and summarize the evidence used to support this description

Canada's contribution to this target is partially reflected in the actions which contribute to Canada Targets 3, 5 and 6, described in sections II and III of this report.

Please describe other activities contributing to the achievement of the Aichi Biodiversity Target at the global level

Ducks Unlimited Canada raises awareness of the importance of wetlands and wetland conservation in Canada and internationally by "twinning" Canadian wetlands with wetlands in other countries. For example, Oak Hammock Marsh Ramsar Site is linked as a sister marsh with similar wetland in Israel. Additionally, Hay-Zama Lakes has been twinned with Dalai Lake in Mongolia, China.

The Western Hemisphere Shorebird Reserve Network facilitates communication and sharing of technical resources among a network of sites in North and South America. The Canadian Shorebird National Working Group represents Canada on the Network.

Canada and China established a collaborative partnership on peatland management and restoration. The main goal is to transfer the knowledge and skill of Canadian peatland scientists for the conservation and restoration of critical northern peatlands in China.

Aichi Target 16: By 2015, the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization is in force and operational, consistent with national legislation.

Please describe how and to what extent your country has contributed to the achievement of this Aichi Biodiversity Target and summarize the evidence used to support this description

Canada supports the objectives of both the Convention and the Nagoya Protocol, recognizing the significant role that access and benefit sharing plays in the Convention. Canada continues to develop a domestic access and benefit sharing policy and to work towards a decision on accession to the Protocol. As part of this process, the Government of Canada has been engaging Canadian provinces, territories, Indigenous communities and stakeholders to provide them with an opportunity to consider possible elements of a domestic access and benefit sharing policy and contribute to an increased understanding of the potential implications should Canada decide to accede to the Nagoya Protocol. The Government of Canada will continue to work diligently with Canadian partners and stakeholders to consider the complex issues around the Nagoya Protocol. Canada will also continue to implement its commitments under the Convention by continuing to develop domestic policy on access and benefit sharing and observing the progress made internationally on the implementation of the Nagoya Protocol.

Aichi Target 17: By 2015 each Party has developed, adopted as a policy instrument, and has commenced implementing an effective, participatory and updated national biodiversity strategy and action plan.

Please describe how and to what extent your country has contributed to the achievement of this Aichi Biodiversity Target and summarize the evidence used to support this description

Canada's National Biodiversity Strategy and Action Plan has evolved in three phases since 1992 when Canada signed and ratified the Convention on Biological Diversity. In 1996, Canada's federal, provincial and territorial governments jointly endorsed the Canadian Biodiversity Strategy which provides a vision, principles and a framework for Canada to identify and take action to ensure the productivity, diversity and integrity of Canada's natural systems. Ten years later, in 2006, Canadian governments approved the Biodiversity Outcomes Framework, an action plan for implementing the Canadian Biodiversity Strategy that sets out long term ecological outcomes to be achieved within an ecosystems-based and adaptive management approach. And in 2015, Canada announced the 2020 Biodiversity Goals and Targets for Canada.

Canada's biodiversity goals and targets for 2020 complement the Canadian Biodiversity Strategy and the Biodiversity Outcomes Framework, and support the global Strategic Plan for Biodiversity 2011-2020. The targets cover a range of near-term priorities including wetland conservation, invasive alien species, Indigenous traditional knowledge, sustainable forestry, agriculture and fisheries, and getting Canadians out into nature. See Sections I of this report for information on each target and Section III for a progress assessment of each.

Canada's national biodiversity policies have been developed collaboratively by Canadian governments, with input and participation from Indigenous organizations and non-government advisors representing the scientific community, agriculture and natural resource sectors, conservation organizations, and others. They are goals and targets for Canada as a whole and are intended to encourage and promote collective action.

Many provincial and territorial governments, including Saskatchewan, Ontario, Quebec, New Brunswick, the Northwest Territories, Nova Scotia, and Alberta, have developed or are updating their own biodiversity strategies and action plans.

Implementation of Canada's national and subnational strategies takes many forms ranging from legal and policy instruments to stewardship and educational programs. These are described throughout Section III of this report.

Aichi Target 18: By 2020, the traditional knowledge, innovations and practices of Indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of Indigenous and local communities, at all relevant levels.

Please describe how and to what extent your country has contributed to the achievement of this Aichi Biodiversity Target and summarize the evidence used to support this description

Canada is strongly committed to Article 8(j) and has taken an international leadership role in promoting the participation of Indigenous peoples in the Convention, both by strengthening the CBD's Working Group on Article 8(j), and by supporting efforts for enhanced participation of Indigenous peoples in other Convention bodies. More specifically, in order to take into account the particular perspectives of Indigenous peoples in Canada, the Government of Canada engages with Indigenous peoples to prepare Canadian positions for biodiversity-related international negotiations, including the Convention on Biological Diversity, and regularly includes Indigenous representatives as full members of its delegations to Convention meetings.

See also reporting on Canada Target 12 and Canada Target 15 in Section III of this Report.

Please describe other activities contributing to the achievement of the Aichi Biodiversity Target at the global level

Canada participates in a number of international discussions and activities that contribute to the achievement of the Aichi Biodiversity Target 18, including through:

The Commission for Environmental Cooperation (CEC), an intergovernmental organization established in 1994 through the North American Agreement on Environmental Cooperation to facilitate collaboration and public participation to foster conservation, protection and enhancement of the North American environment for the benefit of present and future generations, in the context of increasing economic, trade, and social links among Canada, Mexico, and the United States. The CEC work related to the Aichi Biodiversity Target 18 include, notably, the recent establishment by the CEC Council of a roster of experts on traditional ecological knowledge (TEK) to provide advice to the Council on opportunities to apply TEK to the CEC's operations and policy recommendations (in the relevant websites, web links, and files for more information).

- JPAC Advice to Council 07-02: http://www.cec.org/about-us/jpac-advice-council/advice-council-07-02
- CEC Council names roster of experts on traditional ecological knowledge: http://www.cec.org/news-and-outreach/press-releases/cec-council-names-roster-experts-traditional-ecological-knowledge
- Terms of Operation – Roster of Experts on Traditional Ecological Knowledge: http://www.cec.org/about-us/jpac/terms-operation-roster-experts-traditional-ecological-knowledge
- JPAC Advice to Council 16-01: http://www.cec.org/sites/default/files/documents/jpac_advice_council/jpac-advice_16-01.pdf

Aichi Target 19: By 2020, knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred, and applied.

Please describe how and to what extent your country has contributed to the achievement of this Aichi Biodiversity Target and summarize the evidence used to support this description

There are numerous activities ongoing across the federal, provincial and territorial, municipal and community level to support meeting the indicators developed to track progress in meeting Aichi Biodiversity Target 19. This includes the completion of several assessments on the vulnerability of ecological systems and biodiversity to climate change; and the development of multiple management, land use and development plans that enhance the resilience of ecosystems. These efforts have supported the development of the science base, and technologies relating to biodiversity, its values, functioning, status and trends in relation to climate change, and have been shared and transferred across the country. For more details see Canada Target 14 in Section III of this report.

Aichi Target 20: By 2020, at the latest, the mobilization of financial resources for effectively implementing the Strategic Plan for Biodiversity 2011-2020 from all sources, and in accordance with the consolidated and agreed process in the Strategy for Resource Mobilization, should increase substantially from the current levels. This target will be subject to changes contingent to resource needs assessments to be developed and reported by Parties.

Please describe how and to what extent your country has contributed to the achievement of this Aichi Biodiversity Target and summarize the evidence used to support this description

In response to a CBD COP-13 decision, in 2018 Canada submitted to the CBD Secretariat a report on its resources mobilized for biodiversity. The report provided an estimate of the scale and scope of Canadian contributions to support biodiversity conservation by federal, provincial and territorial governments, private and not-for-profit sectors, as well as the role of collective action and non-market approaches, using a diverse range of publicly-available and published source data and information. The report estimated that annual Canadian public and private financial flows related to the objectives of the CBD range were between $6.78 billion in fiscal year (FY) 2011-2012 to $6.98 billion in FY 2014-2015, with a five-year average of $6.58 billion to support biodiversity efforts internationally and domestically. Additionally, the report estimated that Canada had provided an estimated average of $97.78 million annually from FY 2011-2012 to 2014-2015 in Official Development Assistance to support developing countries' efforts under the CBD.

2030 Agenda for Sustainable Development

Based on the description of your country's contributions to the achievement of the Aichi Biodiversity Targets, please describe how and to what extent these contributions support the implementation of the 2030 Agenda for Sustainable Development and the Sustainable Development Goals.

The Government of Canada embraces the universality of the 2030 Agenda and is committed to supporting the implementation of the SDGs in Canada and internationally. Working with its partners, Canada is striving to end poverty and inequality, build more prosperous and peaceful societies and protect the planet.

For Canada, an inclusive approach to domestic implementation of the SDGs will need to span a cross-section of Canadian society in order to truly "leave no one behind." This is particularly applicable to those groups who are marginalized or otherwise vulnerable, which include Indigenous peoples, women and girls, immigrant and refugee populations, people with disabilities and individuals identifying with the LGBTQ2 community.

Many of the Government of Canada's priorities and programs, both domestically and internationally, are already well aligned with the 2030 Agenda:

- Through its focus on the poorest and most vulnerable, including women and girls, Canada's Feminist International Assistance Policy supports the main principle of the 2030 Agenda for Sustainable Development, which is to ensure that no one is left behind in the achievement of the SDGs. New resources and tools for international assistance announced in Budget 2018 will help partner countries working toward achieving all of the SDGs.
- By prioritizing gender equality and the empowerment of all women and girls, Canada supports SDG 5 (gender equality), as well as the achievement of all other SDGs.
- Consistent with the Government of Canada's commitment to advance the work of reconciliation, renewing Canada's relationship with, and outcomes for, Indigenous peoples supports multiple SDGs, including SDG 1 (no poverty), SDG 3 (good health and well-being), SDG 4 (quality education), SDG 6 (clean water and sanitation) and SDG16 (peace, justice and strong institutions).
- By strengthening and growing the middle class, Canada supports SDG 8 (decent work and economic growth) and SDG 10 (reduced inequalities).
- Canada's 2016 to 2019 Federal Sustainable Development Strategy, which sets out Canada's sustainable development priorities, includes a number of Canada's 2020 Biodiversity Goals and Targets, and is linked to many SDGs, including SDG 7 (affordable and clean energy), SDG 13 (climate action), SDG 14 (life below water) and SDG 15 (life on land).
- Canada's support for the Pan-Canadian Framework on Clean Growth and Climate Change, investments in clean economic growth and investments in international climate finance all contribute to SDG 7 (affordable and clean energy), SDG 11 (sustainable cities and communities), SDG 12 (responsible consumption and production) and SDG 13 (climate action).

Furthermore, in Budget 2018, the Government of Canada announced that it would provide $49.4 million over 13 years to establish an SDG unit and fund monitoring and reporting activities by Statistics Canada. This will enable better coordination among all levels of government, civil society organizations and the private sector on Canada's efforts on the 2030 Agenda for Sustainable Development. It will also support the monitoring and reporting of Canada's domestic and international efforts to ensure that all of the SDGs are achieved by 2030 and that no one is left behind. The Government of Canada is also proposing to provide, from existing departmental resources, up to $59.8 million over 13 years for programming to support the implementation of the SDGs.

On July 17th, 2018, Canada presented its first Voluntary National Review report at the United Nations High Level Political Forum in New York, which highlights Canada's progress and action plan to achieve the 2030 Agenda for Sustainable Development at home and abroad.

For more information, and to read Canada's Voluntary National Review, please see the links below.

- Prime Minister Justin Trudeau's Address to the 72nd Session of the United Nations General Assembly: https://pm.gc.ca/eng/news/2017/09/21/prime-minister-justin-trudeaus-address-72th-session-united-nations-general-assembly
- Canada's Implementation of the 2030 Agenda for Sustainable Development: Voluntary National Review: https://sustainabledevelopment.un.org/content/documents/20312Canada_ENGLISH_18122_Canadas_Voluntary_National_ReviewENv7.pdf
- Canada's Feminist International Assistance Policy: http://international.gc.ca/world-monde/issues_development-enjeux_developpement/priorities-priorites/policy-politique.aspx?lang=eng
- Federal Sustainable Development Strategy: http://www.fsds-sfdd.ca/

Section V. Description of the national contribution to the achievement of the targets of the Global Strategy for Plant Conservation

Does Canada have national targets related to the GSPC Targets?

☒ Yes.

Many of Canada's national targets *(please refer to the list of the 2020 Biodiversity Goals and Targets for Canada in Section 1 of this report)* correspond to the targets of the Global Strategy for Plant Conservation (GSPC). The list below illustrates which GSPC targets are aligned with a national biodiversity target or targets.

GSPC Target 1: An online flora of all known plants.

- No directly corresponding national target.

GSPC Target 2: An assessment of the conservation status of all known plant species, as far as possible, to guide conservation action.

- Canada Target 2. By 2020, species that are secure remain secure, and population of species at risk listed under federal law exhibit trends that are consistent with recovery strategies and management plans.

GPSC Target 3: Information, research and associated outputs, and methods necessary to implement the Strategy developed and shared.

- Canada Target 13. By 2020, innovative mechanisms for fostering the conservation and sustainable use of biodiversity are developed and applied.
- Canada Target 14. By 2020, the science base for biodiversity is enhanced and knowledge of biodiversity is better integrated and more accessible.
- Canada Target 17. By 2020, measures of natural capital related to biodiversity and ecosystem services are developed on a national scale, and progress is made in integrating them into Canada's national statistical system.

GSPC Target 4: At least 15 per cent of each ecological region or vegetation type secured through effective management and/or restoration.

- Canada Target 1. By 2020, at least 17 percent of terrestrial areas and inland water, and 10 percent of coastal and marine areas, are conserved through networks of protected areas and other effective area-based conservation measures.
- Canada Target 3. By 2020, Canada's wetlands are conserved or enhanced to sustain their ecosystem services through retention, restoration and management activities.

GSPC Target 5: At least 75 per cent of the most important areas for plant diversity of each ecological region protected with effective management in place for conserving plants and their genetic diversity.

- Canada Target 1. By 2020, at least 17 percent of terrestrial areas and inland water, and 10 percent of coastal and marine areas, are conserved through networks of protected areas and other effective area-based conservation measures.

GSPC Target 6: At least 75 per cent of production lands in each sector managed sustainably, consistent with the conservation of plant diversity.

- Canada Target 6. By 2020, continued progress is made on the sustainable management of Canada's forests.
- Canada Target 7. By 2020, agricultural working landscapes provide a stable or improved level of biodiversity and habitat capacity.
- Some relevance to Canada Target 8. By 2020, all aquaculture in Canada is managed under a science-based regime that promotes the sustainable use of aquatic resources (including marine, freshwater and land based) in ways that conserve biodiversity.

GSPC Target 7: At least 75 per cent of known threatened plant species conserved in situ.

- Canada Target 2. By 2020, species that are secure remain secure, and population of species at risk listed under federal law exhibit trends that are consistent with recovery strategies and management plans.

GSPC Target 8: At least 75 per cent of threatened plant species in ex situ collections, preferably in the country of origin, and at least 20 per cent available for recovery and restoration programmes.

- No directly corresponding national target

GSPC Target 9: 70 per cent of the genetic diversity of crops including their wild relatives and other socio-economically valuable plant species conserved, while respecting, preserving and maintaining associated indigenous and local knowledge.

- No directly corresponding national target

GSPC Target 10: Effective management plans in place to prevent new biological invasions and to manage important areas for plant diversity that are invaded.

- Canada Target 11. By 2020, pathways of invasive alien species introductions are identified, and risk-based intervention or management plans are in place for priority pathways and species.

GSPC Target 11: No species of wild flora endangered by international trade.

- Some relevance to Canada Target 9. By 2020, all fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem-based approaches.

GSPC Target 12: All wild harvested plant-based products sourced sustainably.

- Canada Target 9. By 2020, all fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem-based approaches.
- Canada Target 12. By 2020, customary use by Aboriginal peoples of biological resources is maintained, compatible with their conservation and sustainable use.
- Canada Target 13. By 2020, innovative mechanisms for fostering the conservation and sustainable use of biodiversity are developed and applied.

GSPC Target 13: Indigenous and local knowledge innovations and practices associated with plant resources maintained or increased, as appropriate, to support customary use, sustainable livelihoods, local food security and health care.

- Canada Target 12. By 2020, customary use by Aboriginal peoples of biological resources is maintained, compatible with their conservation and sustainable use.

- Canada Target 15. By 2020, Aboriginal traditional knowledge is respected, promoted and, where made available by Aboriginal peoples, regularly, meaningfully and effectively informing biodiversity conservation and management decision-making.

GSPC Target 14: The importance of plant diversity and the need for its conservation incorporated into communication, education and public awareness programmes.

- Canada Target 14. By 2020, the science base for biodiversity is enhanced and knowledge of biodiversity is better integrated and more accessible.
- Canada Target 18. By 2020, biodiversity is integrated into the elementary and secondary school curricula. Note: the GSPC does not explicitly refer to citizens directly engaging with nature beyond Target 14.
- Canada Target 19. By 2020, more Canadians get out into nature and participate in biodiversity conservation activities.

GSPC Target 15: The number of trained people working with appropriate facilities sufficient according to national needs, to achieve the targets of this Strategy.

- No directly corresponding national target

GSPC Target 16: Institutions, networks and partnerships for plant conservation established or strengthened at national, regional and international levels to achieve the targets of this Strategy.

- No directly corresponding national target

In addition, Canada's national targets emphasize some important areas that are not addressed in the GSPC, for example:

- Canada Target 4. By 2020, biodiversity considerations are integrated into municipal planning and activities of major municipalities across Canada.
- Canada Target 5. By 2020, the ability of Canadian ecological systems to adapt to climate change is better understood, and priority adaptation measures are underway.
- Canada Target 8. By 2020, all aquaculture in Canada is managed under a science-based regime that promotes the sustainable use of aquatic resources (including marine, freshwater and land based) in ways that conserve biodiversity.
- Canada Target 10. By 2020, pollution levels in Canadian waters, including pollution from excess nutrients, are reduced or maintained at levels that support healthy aquatic ecosystems.
- Canada Target 16. By 2020, Canada has a comprehensive inventory of protected spaces that includes private conservation areas.

Please provide information on any active networks for plant conservation present in your country

- As of 2018, 22 botanical gardens and arboreta in Canada are members of either Botanic Gardens Conservation International (BGCI; http://www.bgci.org), a global non-governmental organization, or the American Public Gardens Association (APGA; http://www.publicgardens.org), a regional network. Of these 11 (50%) are members in both networks.
    - Fifteen institutions are members of BGCI, which describes itself as the largest network in the world dedicated to plant conservation. BGCI operates a North American office

designated as BGCI-US (https://www.bgci.org/usa/) which also communicates with members in Canada.
    - Sixteen institutions in Canada are current members of APGA. While APGA is widely based in terms of support to members and subjects of its programs, it has specific professional sections dedicated to plant conservation, education, collections management, and other topics of direct relevance to the targets of the GSPC.
    - In 2016 APGA and BGCI published the North American Botanic Gardens Strategy for Plant Conservation (available on-line at: http://northamericanplants.org/), which is being considered for use by several Canadian institutions. The strategy is intended as a regional response to the 2020 targets of the GSPC. The strategy is a revision of an earlier framework established placed regional targets to correspond to the global targets of the strategy. Neither APGA nor BGCI have established mechanisms to track progress toward these North American regional sectoral targets.
- The Ecological Restoration Alliance of Botanic Gardens (ERA-BG; http://www.erabg.org) has one Canadian member (RBG).
- The Global Partnership for Plant Conservation (GPPC; http://www.plants2020.net/gppc/) is an informal association of botanical gardens, arboreta, museums, NGOs and other agencies pledging to support the achievement of the goals and targets of the GSPC. The GPPC has one Canadian member (RBG).
- The Center for Plant Conservation (CPC - https://saveplants.org/) is a network of botanical gardens across the United States; it does not yet have any Canadian members.
- The North American Native Plant Society (NAMPS; http://nanps.org/) formerly known as the Canadian Wildflower Society, promotes in-situ plant conservation and ecological restoration across Canada.
- The Nature Conservancy of Canada (NCC; http://www.natureconservancy.ca/) is Canada's leading non-profit land conservation organization, which as of 2018 includes over 200,000 supporters and many collaborating organizations. Twenty-six percent of COSWEIC-listed vascular plant species at risk in Canada occur on NCC-protected lands (slightly less than the 31% of all listed species regardless of taxa).
- The Society for Ecological Restoration (SER) maintains two active regional chapters in Canada: in Ontario (SERO; http://chapter.ser.org/ontario/), and in Western Canada (http://chapter.ser.org/westerncanada/).
- The Canadian Botanical Association (CBA; http://www.cba-abc.ca/). The CBA is a professional association of individuals. Its website notes "The Association represents Canadian Botany and botanists in matters of local, national and international importance. The preservation of botanically significant natural areas is of special interest."
- The Plant Conservation Alliance (PCA; https://www.plantconservationalliance.org/) is a public-private partnership based in the United States, with collaborating institutions and organizations in Canada. Their web site currently lists seven organizations in Ontario as collaborating institutions, among a total of 371.
    - Ontario Plant Restoration Alliance: http://www.opra.ca
    - Wildflower Farm: http://www.wildflowerfarm.com/
    - Richters Herbs: http://www.richters.com/
    - Forests Ontario: http://www.forestsontario.ca/

    - Forest Gene Conservation Association of Ontario: http://www.fgca.net
    - The Medicinal Plant Specialist Group IUCN/SSC: http://www.mpsg.org/
    - Wildflower Magazine
- The Canadian Botanical Conservation Network (CBCN) was founded in 1995 and grew to include 27 botanical gardens, arboreta, museums, and other agencies. This network remained active until 2014 but has since not functioned.

Please describe the major measures taken by your country for the implementation of the Global Strategy for Plant Conservation

As noted above, the 2020 Biodiversity Goals & Targets for Canada establish national targets that directly map to eleven of the sixteen 2020 Targets of the GSPC. Information on major measures related to Canada's national targets can be found in Section II of this report and specific information on each of Canada's national targets can be found in Section III of this report.

- Information on Canada's contribution to individual GSPC targets is provided below.

Category of progress towards the target of the Global Strategy for Plant Conservation at the national level

GSPC Target 1: An online flora of all known plants.

☒ On track to achieve target at national level
☐ Progress towards target at national level but at an insufficient rate
☐ No significant change at national level

Please explain the selection above

- Roughly two-thirds of Canada's flora is included in the Flora of North America project (FNA) (http://floranorthamerica.org/), including endemic and introduced species. The FNA is still being compiled, and it is anticipated that once it is complete, all of Canada's flora will be included.

Please describe how and to what extent your country has contributed to the achievement of this GSPC Target and summarize the evidence used to support this description

- Canada is one of the contributors to the Flora of North America project (FNA). In turn, the FNA is the input component for Canada to World On-Line Flora Project (http://www.worldfloraonline.org/).
- Canada's flora is thus already included in the global effort to create a world flora. Some Canadian researchers have contributed directly to the Flora of North America project, and others have and are active in plant taxonomy and systematics studies that are contributing to the world flora. For the most part, this effort is an editorial project that is taking existing information from published floras and preparing them for republication online.
- Canada's contributions to the Flora of North America and the pending global flora also supports Canada Target 14. Once online, Canadians will have access to the global online flora, which opens up interesting opportunities for educational outreach about the diversity of plant life. This will compliment presently-available tools such as Canadensys, the Canadian contribution to GBIF (http://community.canadensys.net/).

Target 2: An assessment of the conservation status of all known plant species, as far as possible, to guide conservation action.

☒ On track to achieve target at national level
☐ Progress towards target at national level but at an insufficient rate
☐ No significant change at national level

Please explain the selection above

- The status of wild species in Canada has been assessed every 5 years since 2000. The Wild Species report considers all species larger than microbes, which includes most fungi, plants and animals. Although more animal species have been assessed, a higher proportion of plant species have been assessed (74% versus 42% of animal species).
- The Wild Species 2015 (http://www.wildspecies.ca/reports) report assessed the conservation status of 29,848 species in 34 species groups. There are 5,211 known species in the vascular plants group in Canada, however, a large number of these not conservation targets, including alien species or otherwise unranked species. 3,846 species of vascular plants are assigned a conservation risk rank. The vascular plant group has the largest number of species at risk, with 1,157 species of the 3,846 ranked species in this group, or about 30%. About 70% of ranked vascular plant species are in one of the secure categories. Please see the Status of Wild Species indicator, one of the Canadian Environmental Sustainability Indicators, for more information: (https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/status-wild-species.html).

Please describe how and to what extent your country has contributed to the achievement of this GSPC Target and summarize the evidence used to support this description

- Canada's domestic species assessment species data and reports are publicly available online to support and contribute to global understanding.

Target 3: Information, research and associated outputs, and methods necessary to implement the Strategy developed and shared.

☒ On track to achieve target at national level
☐ Progress towards target at national level but at an insufficient rate
☐ No significant change at national level

Please explain the selection above

- Information about plant conservation and about work needed to achieve the GSPC targets within Canada is readily available through a variety of sources. Some important data sources include:
    - The Species at Risk Public Registry: https://www.registrelep-sararegistry.gc.ca/ (which includes extensive data sources, status reports, recovery plans, as well as online processes for public comment and input)
    - The Flora of North America On-line: http://floranorthamerica.org/ (presenting species-by-species taxonomic and range information for plants in Canada as well as the USA)

- NatureServe Canada: http://www.natureserve.org/natureserve-network/canada) supports the on-going work of nine Conservation Data Centres (CDCs) covering all of Canada: http://www.natureserve.org/natureserve-network/canada/about-our-cdcs

Please describe how and to what extent your country has contributed to the achievement of this GSPC Target and summarize the evidence used to support this description

- Information from Canada that can support the achievement of this GSPC Target is readily available through a variety of sources. As mentioned above, some important data sources include:
  - The Species at Risk Public Registry: https://www.registrelep-sararegistry.gc.ca/ (which includes extensive data sources, status reports, recovery plans, as well as online processes for public comment and input)
  - The Flora of North America: http://floranorthamerica.org/ (presenting species-by-species taxonomic and range information for plants in Canada as well as the USA)
  - NatureServe Canada: http://www.natureserve.org/natureserve-network/canada) supports the on-going work of nine Conservation Data Centres (CDCs) covering all of Canada: http://www.natureserve.org/natureserve-network/canada/about-our-cdcs

Target 4: At least 15 per cent of each ecological region or vegetation type secured through effective management and/or restoration.

☐ On track to achieve target at national level
☒ Progress towards target at national level but at an insufficient rate
☐ No significant change at national level

Please explain the selection above

- Canada Target 1 aims to conserve 17% of terrestrial areas and inland water by 2020. While the national target does not explicitly focus on conserving representative ecosystems, several efforts in Canada support this GSPC target.
- Canada monitors and reports annually on its network of protected and other conserved areas, including on ecological representation. All of Canada's 18 terrestrial ecozones are at least partially protected, ranging from 1.8% of the Mixedwood Plains ecozone to 24.6% of the Tundra Cordillera. Six ecozones (mostly those that are more remote and farther north) already exceed the 15% GSPC target. While Canada Target 1 does not specify protection of natural areas of particular importance to plant diversity, some areas already under protection contribute directly to the protection of presently-identified at-risk species, or the protection of areas of high plant diversity or endemism.
- Canada's National Parks System Plan's goal is to establish a system of national parks that represents each of Canada's distinct natural regions. This system is just over 77% complete with 30 of 39 natural regions represented by 46 national parks and national park reserves.
- The Pathway to Canada Target 1 (see Sections II and III of this report for details) aims to enhance progress toward achieving Canada Target 1 including addressing the qualitative elements of the target (ecological representation, connectivity and landscape integration, areas important for biodiversity and ecosystem services, management effectiveness, and equitable management).

While planning for protected areas includes consideration of plant and animal species diversity, the initiative intends to develop domestic guidance on a variety of relevant subjects including identifying areas of importance for biodiversity and ecosystem services. The initiative also promotes conservation by non-government partners, such as ownership by not-for-profit organizations, conservation authorities, and others involved in conservation and biodiversity issues. In this way, organizations like botanical gardens and arboreta can contribute to the achieving the target.

- Botanical gardens and arboreta are one group of agencies in Canada that protect natural areas. A recent survey (Galbraith and Kennedy, unpublished) of botanical gardens and arboreta across North America, including Canada, has found that at least 1,630 hectares of natural areas are managed by botanical gardens in Canada. This includes the 900+ hectares of nature sanctuary owned by Royal Botanical Gardens, some of the richest areas in Canada for plant species richness (Galbraith et. at. 2012). Efforts are underway to identify areas, like these, that could potentially contribute to achieving Canada Target 1 as "other effective area-based conservation measures". While 1,630 hectares is a very small contribution to the overall total of protected and conserved areas in Canada, these nature sanctuaries tend to be in urban or near urban areas, are interpreted for the public, and some are subject to intensive efforts to document plant diversity and undertake ecological restoration.
- Work that contributes to Canada Target 3 – conservation, management, and restoration of wetlands (see Sections II and III of this report) – also supports this GSPC target.

Please describe how and to what extent your country has contributed to the achievement of this GSPC Target and summarize the evidence used to support this description

- Ongoing development and expansion of Canada's network of protected and conserved areas contributes to this target at the global level. Information on the extent of Canada's protected areas is included in the World Database on Protected Areas. This information is updated annually including the proportion of protection within each of Canada's ecozones (please see the Canadian Environmental Sustainability Indicators: Canada's conserved areas for more information: https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/conserved-areas.html).

Target 5: At least 75 per cent of the most important areas for plant diversity of each ecological region protected with effective management in place for conserving plants and their genetic diversity.

☐ On track to achieve target at national level
☐ Progress towards target at national level but at an insufficient rate
☒ No significant change at national level

Please explain the selection above

- As noted above, the Pathway to Canada Target 1 initiative intends to develop domestic guidance on identifying areas of importance for biodiversity and ecosystem services. At present, a comprehensive national assessment of important areas for plant diversity within each ecological region is not presently available, however, a general picture of species diversity across the

countries ecological regions is understood, and Canada reports annually on the proportion of each ecozone that is protected (see Sections II and III of this report for more information).

- The areas of highest alpha (species) diversity tend to be in south-central Canada (Ontario and Quebec) and southern British Columbia. The largest numbers of listed species at risk follow areas of human occupation and disturbance, including agricultural lands in the Prairie Provinces. Peak endemism of plant species in Canada is found in the Yukon, in areas corresponding to eastern Beringia and an ice-free refugium during the Wisconsinan glaciation.
- Several "focal landscapes" have been identified in Canada as part of the Government of Canada's Habitat Stewardship Program, which provides funding for conservation projects. These areas represent landscapes of significant conservation value, such as those with high occurrences and/or diversity of species at risk (including, but not limited to plants) and migratory birds or those with important habitat for these species. They are:
    - Southwest Nova Scotia
    - St. Lawrence Lowlands
    - Long Point Walsingham Forest
    - Milk River Watershed (South of Divide) – Saskatchewan
    - Dry Interior BC
    - Southwest BC
- While the proportion of ecological areas with effective management in place for conserving plants and their genetic diversity, is not known, the proportion of protection within each of Canada's ecozones is reported annually. This ranges from 1.8% (Mixedwood Plains) to 25.5% (Pacific Maritime) protected. (Please see the Canadian Environmental Sustainability Indicators: Canada's conserved areas for more information: https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/conserved-areas.html).
- Because important areas for plant diversity have not been identified for Canada it is not possible to state with assurance that the goal will be met by 2020.

Please describe how and to what extent your country has contributed to the achievement of this GSPC Target and summarize the evidence used to support this description

- The extent of Canada's contribution to this GSPC target is not known at present.

Target 6: At least 75 per cent of production lands in each sector managed sustainably, consistent with the conservation of plant diversity.

☐ On track to achieve target at national level
☒ Progress towards target at national level but at an insufficient rate
☐ No significant change at national level

Please explain the selection above

- Production lands include those that are used primarily for agricultural production, livestock grazing, and forestry.
- While data on management practices consistent with the conservation of plant diversity are not available for Canada, information on sustainable management of Canada's forestry and

agricultural sectors is provided in Sections II and III of this report in the context of Canada Targets 6 and 7.

- Canada has approximately 347 million hectares of forest land, representing roughly 9% of the world's forests. Of Canada's total forest area, 226 million hectares, or 65%, is considered to be managed, while the remaining 35% of Canada's forest land is considered unmanaged. There is little human activity and no commercial harvesting within Canada's unmanaged forests. Over 91%, or 206 million hectares, of Canada's managed forests have a long term management plan in place. Approximately 74%, or 168 million hectares, of Canada's managed forests is covered by an independently verified certification scheme.
- 2011 data on the proportion of farms in Canada with an Environmental Farm Plan showed that 35% of farms in Canada had a formal written Plan, which accounts for 50% of Canada's agricultural land area.

Please describe how and to what extent your country has contributed to the achievement of this GSPC Target and summarize the evidence used to support this description

- Because the extent of areas management in a manner consistent with the conservation of plant diversity has not been identified for Canada it is not possible to assess Canada's contribution to this GSPC target, however, some area-based information on management (provided above) may support a better understanding of global progress.

Target 7: At least 75 per cent of known threatened plant species conserved in situ.

☐ On track to achieve target at national level
☒ Progress towards target at national level but at an insufficient rate
☐ No significant change at national level

Please explain the selection above

- The *Wild Species 2015* (http://www.wildspecies.ca/reports) report assessed the conservation status of 29,848 species in 34 species groups. There are 5,211 known species in the vascular plants group in Canada, however, a large number of these not conservation targets, including alien species or otherwise unranked species. 3,846 species of vascular plants are assigned a conservation risk rank. The vascular plant group has the largest number of species at risk, with 1,157 species of the 3,846 ranked species in this group, or about 30%. About 70% of ranked vascular plant species are in one of the secure categories. Please see the Status of Wild Species indicator, one of the Canadian Environmental Sustainability Indicators, for more information (https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/status-wild-species.html).

Please describe how and to what extent your country has contributed to the achievement of this GSPC Target and summarize the evidence used to support this description

- Canada's conservation efforts to secure threatened plant species domestically contribute to the global effort to meet this target. The specific extent of Canada's contribution to this GSPC target at the global level is not known.

Target 8: At least 75 per cent of threatened plant species in ex situ collections, preferably in the country of origin, and at least 20 per cent available for recovery and restoration programmes.

☐ On track to achieve target at national level
☐ Progress towards target at national level but at an insufficient rate
☒ No significant change at national level

Please explain the selection above

- While Canada has an extensive ex-situ collection of species consisting of approximately 25.9 million species, including plants and non-plants (see Progress assessment: Canada Target 14 in this report for more information) the number of plant species at risk within this collection is not available at this time and therefore, an estimate of the proportion of plant species at risk in Canada for which genetic material is protected within a seed or tissue gene bank is also unavailable at present.
- Seed gene banks do exist, such as the GRIN-CA Plant Gene Resources of Canada at the University of Saskatchewan, but ex-situ conservation and restoration programs for wild plant diversity are not the primary functions of such facilities in Canada. Some botanic gardens and arboreta may hold living plant collections representing populations of threatened species disjunct from their native ranges, but these are typically not part of a coordinated conservation effort. An exception is the collection of rare tree species of Ontario held at the University of Guelph Arboretum. This collection includes disease resistant American Elm and American Chestnut, the latter being used in a genetic recovery program under the Gosling Centre for Plant Conservation.

Please describe how and to what extent your country has contributed to the achievement of this GSPC Target and summarize the evidence used to support this description

- The extent of Canada's contribution to this GSPC target is not known.

Target 9: 70 per cent of the genetic diversity of crops including their wild relatives and other socio-economically valuable plant species conserved, while respecting, preserving and maintaining associated indigenous and local knowledge.

☐ On track to achieve target at national level
☐ Progress towards target at national level but at an insufficient rate
☒ No significant change at national level

Please explain the selection above

- At present an assessment of progress toward this GSPC target at the national level is not possible, however, Canada's activities to maintain the diversity of genetic resources are described in Section IV of this report in the context of Canada's contribution to Aichi Target 13.
- In addition, information on customary use of biological resources by Indigenous people (including but not limited to plants) and on respect and promotion of Indigenous knowledge can be found in Section III of this report in the progress assessment for Canada Targets 12 and 15 and in the supplementary reports associated with each of these targets.

Please describe how and to what extent your country has contributed to the achievement of this GSPC Target and summarize the evidence used to support this description

- Information relevant to Canada's domestic and international activities to maintain the diversity of genetic resources can be found in Section IV of this report in the context of Canada's contribution to Aichi Target 13.

Target 10: Effective management plans in place to prevent new biological invasions and to manage important areas for plant diversity that are invaded.

☒ On track to achieve target at national level
☐ Progress towards target at national level but at an insufficient rate
☐ No significant change at national level

Please explain the selection above

- Information on Canada's domestic and international activities with respect to invasive alien species can be found in Sections II, III and IV of this report.

Please describe how and to what extent your country has contributed to the achievement of this GSPC Target and summarize the evidence used to support this description

- Information on Canada's domestic and international activities with respect to invasive alien species can be found in Sections II, III and IV of this report.

Target 11: No species of wild flora endangered by international trade.

☒ On track to achieve target at national level
☐ Progress towards target at national level but at an insufficient rate
☐ No significant change at national level

Please explain the selection above

- Canada is a signatory to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). Under this Convention, Canadian forest interests include a focus on addressing illegal harvest and illegal international trade in forest commodities, and on development of CITES regulations that support legal and sustainable international trade.
- The Wild Animal and Plant Protection and Regulation of International and Interprovincial Trade Act (WAPPRIITA) is the legislative vehicle by which Canada meets its obligations under CITES. The purpose of WAPPRIITA is to protect Canadian and foreign species of animals and plants that may be at risk of overexploitation due to illegal trade and also to safeguard Canadian ecosystems from the introduction of species considered to be harmful. It accomplishes these objectives by controlling the international trade and interprovincial transport of certain wild animals and plants, as well as their parts and derivatives. WAPPRIITA also makes it an offence to transport illegally obtained wildlife between provinces and territories or between Canada and other countries.

Please describe how and to what extent your country has contributed to the achievement of this GSPC Target and summarize the evidence used to support this description

- The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) regulates legal international trade in specimens of species of wild fauna and flora to ensure that international trade species is not detrimental to their survival. Canada is very active in the work of CITES to help ensure sustainable trade in species. Canada is the Chair of the CITES Standing Committee and the Chair of the CITES Plants Committee. Canada additionally contributes to CITES decision-making through participation and leadership in key working groups that discuss and provide advice on implementation of the Convention. This includes contributions in past discussions to ensure the CITES Strategic Plan contributes to, and is coherent with, the Aichi Targets, including Aichi Biodiversity Target 12. Canada also is Chair of the Strategic Vision Working Group to develop an updated Strategic Plan that will align with the 2030 Agenda for Sustainable Development, its Sustainable Development Goals and Targets.

Target 12: All wild harvested plant-based products sourced sustainably.

☐ On track to achieve target at national level
☐ Progress towards target at national level but at an insufficient rate
☒ No significant change at national level

Please explain the selection above

- At present, the proportion of wild harvested plant-based products that are sourced sustainably is not known.
- A wide variety of economically-valuable, plant-based non-timber forest products are produced in Canada, including maple syrup. Some of these products are truly wild-harvested while others are produced by wildcrofting (plants planted and grown within forests) such as American Ginseng.
- Information on sustainable forest management can be found in Section III of this report in the context of Canada Target 6 and in Section IV of this report in the context of Aichi Target 4.
- Information on customary use of biological resources by Indigenous people (including but not limited to plants) can be found in Section III of this report in the progress assessment for Canada Target 12 and in the associated supplementary report.

Please describe how and to what extent your country has contributed to the achievement of this GSPC Target and summarize the evidence used to support this description

- Information on sustainable forest management can be found in Section III of this report in the context of Canada Target 6 and in Section IV of this report in the context of Aichi Target 4.

Target 13: Indigenous and local knowledge innovations and practices associated with plant resources maintained or increased, as appropriate, to support customary use, sustainable livelihoods, local food security and health care.

☐ On track to achieve target at national level
☒ Progress towards target at national level but at an insufficient rate
☐ No significant change at national level

Please explain the selection above

- Information on customary use of biological resources by Indigenous people (including but not limited to plants) and on respect and promotion of Indigenous knowledge can be found in Section III of this report in the progress assessment for Canada Targets 12 and 15 and in the supplementary reports associated with each of these targets.
- Individual examples of programs that are addressing the desires of Indigenous communities to protect, preserve, transmit and use traditional knowledge and local innovations related to plant resources, such as:
    - A program begun in the 1990s is preserving Indigenous names and uses of plants by the Haudenosaunee communities of the Six Nations of the Grant River Territory. In partnership with the Indigenous Studies Program (ISP) of McMaster University, Royal Botanical Gardens (Hamilton and Burlington, Ontario) hosts the Six Nations Herbarium, a collection of plant specimens prepared between 2003 and 2005 with support from the Museum Assistance Program of the Department of Canadian Heritage. This collection of approximately 500 plant specimens is the property of the Six Nations community. RBG will be happy to facilitate rematriation of the material at any time. Discussions and further research in this direction are taking place in 2018. The herbarium was developed in support of an effort by the ISP to record and protect traditional names for plants of medicinal, culinary, or cultural value among the Haudeonasuee of Ontario. The actual list of traditional plant names is retained by the ISP.
    - The role of plants in the cultural, culinary, and medical practices of Anishinaabe peoples in Ontario has been presented for public interpretation at RBG in "Enji naagdowing Anishinaabe waadiziwin: The Journey to Anishinaabe knowledge." This 1.5 km interpreted outdoor trail experience was developed by an Anishinaabe herbalist from Manitoulin Island and elders of the Mississaugas of the New Credit First Nation, with support from RBG interpretive staff and funding support from the Ontario 150 fund. Its goal is to interpret contemporary and traditional use of plants among Anishinaabe communities today for the general public in a way the Indigenous communities want this vital part of their biocultural heritage presented.

Please describe how and to what extent your country has contributed to the achievement of this GSPC Target and summarize the evidence used to support this description

- Information on Canada's activities relevant to this target can be found in Section IV of this report in the context of Aichi Target 18.

Target 14: The importance of plant diversity and the need for its conservation incorporated into communication, education and public awareness programmes.

☒ On track to achieve target at national level
☐ Progress towards target at national level but at an insufficient rate
☐ No significant change at national level

Please explain the selection above

Information on education, public awareness and engagement with respect to biodiversity generally can be found in Sections II and III of this report in the context of Canada's Targets 18 and 19, which focus on

integrating biodiversity into school curricula and connecting Canadians with nature, respectively. The following are examples of relevant communication, education and public awareness programmes and what they do:

- The Biodiversity Education and Awareness Network (BEAN), based in Ontario, is "a network of organizations working together to promote an increased awareness and understanding of biodiversity." It achieves this by developing educational resources, supporting events and activities, and providing an online calendar or events based on biodiversity.
- PlantWatch is a website that allows citizen scientists to record blooming and bud break observations of plant species. It uses this information in scientific publications on phenology and global change. Other projects from NatureWatch, the umbrella organization, encourage participants to observe and record information on frogs, worms, and ice.
- BioBlitzes have been organized across Canada. Bioblitz events bring amateur naturalists, professional biologists, and enthusiastic members of the public together to engage in a 24 hour event of wildlife observation. The nascent National BioBlitz program is organized in partnership with the Royal Ontario Museum and the Canadian Wildlife Federation. The scientific goal is to record every species present in a given area to produce comprehensive biological inventories. By repeating BioBlitzes on a regular schedule, it will be possible to observe changes in species richness over time. Participation in the Ontario BioBlitz Program Flagship Events shows a steady increase from 2012 to 2015, and is expected to continue increasing in 2016 (Dave Ireland, personal communication, 29 March 2016). Across Canada, many National and Provincial Parks and Botanic Gardens have educational programs related to biodiversity. These can include interpretive nature walks, talks and presentations, workshops and hands-on activities. They are often targeted towards children, youth or adults but can also be generally accessible to all age groups.

Target 15: The number of trained people working with appropriate facilities sufficient according to national needs, to achieve the targets of this Strategy.

☐ On track to achieve target at national level
☐ Progress towards target at national level but at an insufficient rate
☒ No significant change at national level

Please explain the selection above

- No estimate of the number of trained people working with appropriate facilities sufficient to achieve the targets of this strategy within Canada is currently available.

Target 16: Institutions, networks and partnerships for plant conservation established or strengthened at national, regional and international levels to achieve the targets of this Strategy.

☐ On track to achieve target at national level
☒ Progress towards target at national level but at an insufficient rate
☐ No significant change at national level

Please explain the selection above

- The Canadian Botanical Conservation Network (CBCN) was established as a project among the botanical gardens across Canada in 1995. It was subsequently inactivated in 2014. There remains interest in collaboration among botanical gardens around plant conservation issues. Several botanical gardens in Canada are members of Botanic Gardens Conservation International (BGCI) and the American Public Gardens Association (APGA). In 2016 APGA and BGCI published the North American Botanic Gardens Strategy for Plant Conservation, which is being considered for use by several Canadian institutions. The strategy is intended as a regional response to the 2020 targets of the GSPC.

Please describe how and to what extent your country has contributed to the achievement of this GSPC Target and summarize the evidence used to support this description

- Royal Botanical Gardens remains the sole Canadian member of the Global Partnership for Plant Conservation (GPPC), an informal network of organizations dedicated to helping achieve the targets of the Global Strategy for Plant Conservation.
- In recent years a new network, the Ecological Restoration Alliance of Botanic Gardens (ERA-BG) has been formed. It includes approximately 25 institutions world-wide. Royal Botanical Gardens is the only Canadian member of this alliance in 2018. In October 2018 RBG will host the annual international meeting of the alliance.

Section VI. Additional information on the contribution of Indigenous peoples and local communities

Additional information on the contribution of Indigenous peoples and local communities to the achievement of the Aichi Biodiversity Targets if not captured in the sections above

Please see the submission from the Native Women's Association of Canada entitled "*Indigenous Women and Girls, Traditional Knowledge, and Environmental Biodiversity Protection*". The submission pertains to biodiversity conservation over-all and more specifically to Canada Targets 12 and 15. The document is included as a linked attachment in the relevant websites, web links, and files for more information.

In Canada, there are 25 modern treaties with Indigenous peoples. These modern treaties promote strong and sustainable Indigenous communities, and create enduring intergovernmental relationships between treaty partners. Further, modern treaties establish certainty with respect to the ownership and management of lands and resources, create a stable climate for investment, and promote broader economic and policy objectives to the benefit of all Canadians. Many modern treaties also establish and provide certainty with respect to self-government, laying out Aboriginal groups' law-making powers and equipping them to develop and deliver programs and services that are tailored to the unique needs of their communities. Modern treaties have allowed federal, provincial, territorial and Indigenous governments to establish cooperative management regimes for the conservation and sustainable use of renewable and non-renewable resources. Through these negotiated cooperative agreements, Indigenous peoples are assuming increased responsibility for the management of biodiversity in Canada.

Canada Target 2
Contribution by Indigenous peoples is facilitated with funding for Indigenous partners and Indigenous peoples, such as the Assembly of First Nations, Inuit Tapiriit Kanatami, the Métis National Council, the Native Women's Association of Canada, and the Congress of Aboriginal Peoples, which all have 3-year contribution agreement funding (2016-2019) to enable them to engage in and provide input and views on the development and implementation of policies and programs related to conservation, wildlife and biodiversity. The amounts received vary. The activities to be undertaken also vary, but include engagement on policy and participation and attendance in national and international fora on conservation and biodiversity. Further funding is also available for bilateral arrangements used to undertake awareness activities within their communities on SARA requirements and funding opportunities; provide advice and recommendations on SARA issues, including on proposed policies and reform; and, support the use of Indigenous Traditional knowledge in implementation of the SARA.

The Aboriginal Fund for Species at Risk (AFSAR), supports Indigenous organizations and communities across Canada to build capacity to enable them to participate actively in the conservation and recovery of species protected under SARA. Capacity building includes skill development (education, training, learning), tool development (systems or mechanisms), and information management (data) to enable Indigenous organizations and communities to acquire, develop, and use knowledge and skills so that they can play an active role in the implementation of SARA. Between April 1, 2013 and the end of March 2016, AFSAR invested over $10.9 million in 249 Species at Risk projects. The projects involved 212 individual communities, and benefited on average 53 species that are listed under SARA annually.

Canada Target 3
Indigenous / Traditional Knowledge

Note: *The terms 'Traditional Knowledge' (TK), 'Aboriginal Traditional Knowledge' (ATK), and 'Indigenous Knowledge' (IK) are used interchangeably throughout this report. The terms TK and ATK were formally used in the Canadian context, and the government of Canada is now turning to the use of the terms 'Indigenous' and 'Indigenous Knowledge'.*

Alberta considered Traditional knowledge and Aboriginal water use in the development of the Aboriginal Navigation Index for the Lower Athabasca River, and is collaborating with Indigenous groups on the development and deployment of a Navigation Hazard Application. Data acquired through the application will help inform future updates to the water management framework.

The new resource management framework under Manitoba's Peatlands Stewardship Act (2014) promotes industry engagement with Indigenous communities on land management and recovery plans, with the intent of including traditional knowledge in resource planning.

In Ontario, the new Wetland Conservation Strategy for Ontario 2017-2030 contains actions to build local tools in managing local traditional ecological knowledge related to wetlands.

In the Northwest Territories, a number of research and monitoring projects (http://www.nwtwaterstewardship.ca/srdp) ensure Indigenous communities have the opportunity to be actively involved in research, monitoring, and planning initiatives along the Slave River Delta using both traditional knowledge and western science.

Cultural values are also taken into account for the effective management of Ramsar Sites. For example, two Ramsar Sites in Wood Buffalo National Park (Peace-Athabasca Delta and Whooping Crane Summer Range) contribute to strengthening cultural and traditional practices and knowledge. Park managers work collaboratively with 11 Indigenous groups who help manage traditional harvesting and cultural activities within the park. These opportunities deliver on conservation management objectives through education and research collaborations offering Indigenous communities assistance in building a bigger awareness of culturally important sweetgrass.

Participation

The Canadian federal government involves Indigenous peoples in a number of processes that impact wetlands and a number of Indigenous groups have received funding from federal funding programs. For example, the Aboriginal Fund for Species at Risk provides incentives for Indigenous groups to recover species at risk and protect their habitat, which includes wetlands. A number of Indigenous groups have received funding from the National Wetland Conservation Fund, which supports the restoration of wetlands and engages communities in wetland stewardship. For example, in 2016/2017, Katzie First Nation in British Columbia received funding from the Aboriginal Fund for Species at Risk and the National Wetland Conservation Fund to help re-establish traditional knowledge and harvest of the Wapato plant in wetlands of their territory within the Fraser Valley.

Ontario's Wetland Conservation Strategy 2017-2030 identifies several actions related to working with Indigenous and Metis groups to increase knowledge and awareness of Indigenous wetland perspectives and to support the management of local traditional ecological knowledge.

In the Atlantic Provinces, many Indigenous groups are working with local communities to encourage the involvement of Indigenous groups in the development of management plans for Ramsar Sites and within the decision-making processes related to the wise use of wetlands. For example, in Nova Scotia there is an effort by the government to consult with the Assembly of Nova Scotia Mi'kmaq Chiefs.

At Lac Saint-François National Wildlife Area in Quebec, wetlands are managed in collaboration with the adjacent Indigenous community (Mohawks of Akwesasne). This community is involved in the ecological monitoring of the National Wildlife Area as well as in the control of rough alder, a shrub species that invades and disrupts sedge marshes, potential habitat for a species at risk, the Yellow Rail, and the Sedge Wren.

In Nunavut, Ramsar Sites located within National Wildlife Areas and Migratory Bird Sanctuaries are co-managed by Environmental and Climate Change Canada and Inuit through co-management committees established pursuant to the Nunavut Agreement. Through the provisions of this modern treaty, decision making for National Wildlife Areas and Migratory Birds Sanctuaries within the Nunavut Settlement Area is substantially informed and influenced by Inuit Qaujimajatuqangit (Inuit traditional knowledge). These co-management committees are involved in drafting the site-specific management plans.

Relevant websites, web links and files

- Linked attachment: NWAC: Indigenous Women and Girls, Traditional Knowledge, and Environmental Biodiversity Protection: http://twk.pm/2ffqkqthns
- Ontario Wetland Conservation Strategy: http://apps.mnr.gov.on.ca/public/files/er/wetland-conservation-strategy.pdf