

Draft Biodiversity Goals & Targets for Canada

Goal A. By 2020, Canada's lands and waters are planned and managed using an ecosystem approach to support biodiversity conservation outcomes at local, regional and national scales.

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.
2. By 2020, species at risk listed under federal law exhibit, at the time of reassessment, population and distribution trends that are consistent with achieving the objectives of existing federal recovery strategies.
3. By 2020, Canada's wetlands are conserved or enhanced to sustain their ecosystem services through retention, restoration and management activities.
4. By 2020, biodiversity considerations are integrated into municipal planning and activities of major municipalities across Canada.
5. By 2020, the ability of Canadian ecological systems to adapt to climate change is better understood, and priority adaptation measures are underway.

Goal B. By 2020, direct and indirect pressures as well as cumulative effects on biodiversity are reduced, and production and consumption of Canada's biological resources are more sustainable.

6. By 2020, continued progress is made on the sustainable management of Canada's forests.
7. By 2020, agricultural working landscapes provide a stable or improved level of biodiversity and habitat capacity.
8. By 2020, aquaculture management promotes the sustainable use of aquatic resources (including marine, freshwater and land-based) in ways that conserve biodiversity.
9. By 2020, all fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem-based approaches.
10. By 2020, nutrient levels are stabilized or reduced in lakes of the major drainage areas of Canada.
11. By 2020, pathways of invasive alien species introductions are identified, and risk-based intervention plans are in place for priority pathways and species.
12. By 2020, innovative mechanisms for fostering the conservation and sustainable use of biodiversity are developed and applied.

Goal C. By 2020, Canadians have easy access to adequate and relevant information about biodiversity and ecosystem services to support conservation planning and decision-making.

13. By 2020, the science base for biodiversity is enhanced and knowledge of biodiversity, including traditional and community knowledge, is better integrated and more accessible.
14. By 2020, Canada has a comprehensive inventory of protected spaces that includes private conservation areas.
15. 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.

Goal D. By 2020, Canadians are informed about the value of nature and more actively engaged in its stewardship.

16. By 2020, biodiversity is integrated into the elementary and secondary school curricula.
17. By 2020, more Canadians participate in biodiversity conservation activities.

2020 BIODIVERSITY GOALS AND TARGETS FOR CANADA

Goal A. By 2020, Canada's lands and waters are planned and managed using an ecosystem approach to support biodiversity conservation outcomes at local, regional and national scales.

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.

Possible indicator(s):

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

Why is this Target important for Canada?

Canada's natural spaces are a vital component of our culture, heritage, economy and our future, and they are of global importance. Canada's forests, wetlands, prairies, tundra and oceans provide essential ecosystem services. 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 are ours to enjoy, protect and share. Canada'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 our key means of conserving biodiversity in Canada and is vital in maintaining the ecosystem services provided by these areas. Canada's parks and protected areas provide a living legacy for future generations of Canadians, affording opportunities for people to discover and learn about nature. Canada has made great progress through the creation of national, provincial, and municipal parks and many other types of conservation areas. As pressures that threaten to degrade natural areas continue to increase, even greater effort is required to protect our land and water through a variety of means.

Links to the Convention on Biological Diversity Strategic Plan 2011-2020

This target for Canada is linked with the global Aichi Target 11

Meeting the Target

As of 2012, approximately 10% of Canada's terrestrial territory is conserved within federal, provincial and territorial protected areas, and about 1% of Canada's marine territory is preserved in marine protected areas. These totals however, do not reflect the broader diversity of conservation areas that exist across the country that complement the role of protected areas in conserving nature. In order to meet the national target of conserving 17% of our land and 10% of our marine territory by 2020, all levels of government, the private sector, the non-profit sector, landowners and citizens will need to work together to expand Canada's protected areas systems and networks and advance other area-based conservation measures. It will be important to maintain the focus of protection and area based conservation efforts on areas that are ecologically representative and important for biodiversity and ecosystem services, and to ensure that these areas are well-connected and effectively managed. Further, there is a need to integrate these areas into the wider landscapes and seascapes in which they are situated. Progress in conserving Canada's land and water is currently monitored, tracked and reported using the Conservation Areas Reporting and Tracking System under the auspices of the Canadian Council on Ecological Areas, the Canadian Environmental Sustainability Indicators, and by Environment Canada, the Department of Fisheries and Oceans and Parks Canada. These methods will continue to be used to report on further progress.

Key Concepts

Terrestrial areas and inland water: All land and water above the high-tide line including lakes, rivers, and streams.

Coastal and marine areas: Coastline below the high-tide line, coastal estuaries and salt marshes, and ocean waters contained within Canada's marine territory.

Protected area: A clearly defined geographical space recognized, dedicated, and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values. (International Union for Conservation of Nature definition)

Other effective area-based conservation measures: Spatially explicit measures that provide a net conservation benefit, but are not formally designated protected areas. Specific screening criteria for these measures are to be developed.

How will progress be measured?

The area of land and waters that is protected in Canada is a measure of human response to the loss of biodiversity and natural habitat. The two indicators proposed for this target rely on up-to-date data on protected areas and other effective area-based conservation measures in Canada, both on land and at sea. Data for different elements of the target would be drawn from a number of sources. The amount and proportion of Canada's terrestrial (land and inland water) and coastal and marine area that is assessed as protected under the international definition of a protected area is reported on under the Canadian Environmental Sustainability Indicators (CESI) initiative and the Conservation Areas Tracking and Reporting System. Data on "other effective area-based conservation measures" is being collected through various means in different jurisdictions and by non-governmental conservation organizations. This data will be tracked and could be reported separately. Integrating this data in order to have a comprehensive picture of all the protected areas and other effective area-based conservation measures in Canada will be undertaken over the coming years. Target 14: *By 2020, Canada has a comprehensive inventory of protected spaces that includes private conservation areas,* highlights this data integration effort.

2020 BIODIVERSITY GOALS AND TARGETS FOR CANADA

Goal A. By 2020, Canada's lands and waters are planned and managed using an ecosystem approach to support biodiversity conservation outcomes at local, regional and national scales.

Target 2. By 2020, species at risk listed under federal law exhibit, at the time of reassessment, population and distribution trends that are consistent with achieving the objectives of existing federal recovery strategies.

Possible indicator(s):

- Species at risk population trends (i.e. trends in population sizes of species at risk compared to recovery strategy objectives)
- Changes in wildlife species disappearance risks

Why is this target important for Canada?

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 Canadians' natural and cultural heritage. However, the well-being of some of these species is under threat. Canada currently has over 400 species that are legally listed under federal law as "at risk", largely as a result of habitat disturbance and loss, 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.

Links to the Convention on Biological Diversity Strategic Plan 2011-2020
This target for Canada is linked with the global Aichi Target 12

Meeting the target

Meeting this target will involve continued consultation and cooperation with Canadians on the protection of species in Canada. Sustained work at the federal, provincial, territorial levels and with Aboriginal governments and communities, to promote partnerships and stewardship activities that protect species at risk and their habitat, and to implement national and local laws and strategies will be essential. The *Accord for the Protection of Species at Risk*, which commits Canada's federal, provincial and territorial governments to a common approach to protecting species at risk, the *Species at Risk Act* (SARA) and activities under programs such as the *Habitat Stewardship Program for Species at Risk* are key components of a Canadian strategy for the protection of wildlife species at risk. All provinces and territories have species at risk or wildlife legislation that mandates the protection of species and habitat. Canada's approach aims to prevent wildlife species from becoming extinct by securing the necessary actions for their recovery, while managing other species to prevent them from becoming at risk.

Cooperation beyond Canada's borders is needed as well, as many species at risk have only a small portion of their global or continental range in Canada. Recovery strategies aim to make certain that the Canadian portion of these species' recovery needs is ensured. Species vary greatly in their recovery needs and the length of time it can take to see improvement in population numbers or distribution - hundreds of years in some cases. For this reason, improvement may be difficult to detect by 2020 in some species. As a result, the Species at Risk target focuses on the objectives established for each species in their Canadian recovery strategy. Progress will be measured in terms of trends toward recovery by 2020 detected during regular reassessment exercises.

Key concepts

Federally listed species at risk: Species listed under the federal *Species at Risk Act* (SARA). Note that provinces and territories can and do assess and list species within their jurisdictions independent of the COSEWIC (Committee on the Status of Endangered Wildlife in Canada) and SARA processes.

National reassessment: As conducted by COSEWIC, the Committee on the Status of Endangered Wildlife in Canada. COSEWIC is a committee of wildlife experts who assess the status of wildlife species populations that may be at risk of

disappearing from Canada. COSEWIC designations are taken into consideration by the government of Canada when establishing the legal list of wildlife species at risk.

Population and distribution trends: Species listed at under the *Species at Risk Act* require either a Management Plan (special concern) or a Recovery Strategy (unless extinct), which contains population and distribution objectives.

Wildlife species: A species, subspecies, variety or geographically or genetically distinct population of animal, plant or other organism, other than a bacterium or virus, that is wild by nature and is either native to Canada or has extended its range into Canada without human intervention and has been present in Canada for at least 50 years.

How will progress be measured?

The indicators proposed for this target are part of the Canadian Environmental Sustainability Indicators (CESI) program, which provides data and information to track Canada's performance on key environmental sustainability issues.

The species at risk population trends indicator provides an assessment of the recovery trends of species under Environment Canada's jurisdiction (data from Fisheries and Oceans Canada and Parks Canada will be integrated in future updates) that are included on the List of Wildlife Species at Risk under the *Species at Risk Act* (SARA) as extirpated (the species is no longer present in Canada but exists elsewhere), endangered or threatened, that have a final recovery strategy, and that are determined to be biologically and technically feasible to recover. The data for this indicator are compiled from two sources. Recovery objectives are drawn from recovery strategies of species listed as extirpated, endangered or threatened on the List of Wildlife Species at Risk under SARA. Final and proposed species recovery strategies¹ are made available to the public through the Species at Risk Public Registry. Population trends are extracted from the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) assessments, which are also available through the Registry.

The changes in wildlife species disappearance risks indicator uses the findings of COSEWIC to report on changes in wildlife species disappearance risks in Canada. The indicator measures conservation effectiveness and was developed in partnership with the COSEWIC Secretariat at Environment Canada. Data are drawn from COSEWIC Wildlife Species Status Reports, which are available through the Species at Risk Public Registry.

¹ The Species at Risk Public Registry provides both 'final' and 'proposed' recovery strategies for species at risk in Canada. A recovery strategy is considered 'final' once all consultation and approval processes have been completed.

2020 BIODIVERSITY GOALS AND TARGETS FOR CANADA

Goal A. By 2020, Canada's lands and waters are planned and managed using an ecosystem approach to support biodiversity conservation outcomes at local, regional and national scales.

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

Possible indicator(s):

- Habitat area retained, managed, and restored.

Why is this target important for Canada?

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 upon, such as flood and drought control, 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 to be provided. Conserving and enhancing Canadian wetlands will benefit wildlife and plant species, ensure the maintenance of vital ecosystem services, and contribute to the health and well-being of Canadians.

*Links to the Convention on Biological Diversity Strategic Plan 2011-2020
This target for Canada is linked with the global Aichi Targets 4, 5, 14 and 15*

Meeting the target

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 preserve wetlands are underway. 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 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. Ducks Unlimited Canada is leading the development of a Canadian Wetlands Inventory and Environment Canada is developing the Wetlands Indicator under the Canadian Environmental Sustainability Indicators (CESI) initiative. Both 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 agricultural users, municipal and regional land use planners, developers, industry and recreational users will be vital.

Key concepts

Ecosystem Services: The materials that ecosystems provide (e.g. food, fuel, fibre, medicine); the ways that ecosystems regulate environmental conditions (e.g. clean the air and water, prevent soil erosion, reduce the spread of disease, mitigate impacts of climate); and their contributions to cultural life (e.g. education, recreation, inspiration, physical and mental health including cognitive development).

Enhancement: Actions carried out on wetland and/or upland habitats to increase their carrying capacity for wildlife and their ability to provide ecosystem services.

Retention: The protection (or preservation) of functional wetlands for ecosystem services and the provision of suitable habitat for wildlife.

Management: Activities conducted on wetland and/or upland habitats to manage and maintain their carrying capacity for wildlife and their ability to provide ecosystem services.

Restoration: The creation or improvement of wetlands and the ecosystem services that they provide.

Wetland: A land that is saturated with water long enough to promote wetland or aquatic processes as indicated by poorly drained soils, hydrophytic vegetation, and various kinds of biological activity which are adapted to a wet environment.

How will progress be measured?

The indicator proposed for this target reports on the amount of Canadian wetland and associated upland habitat that has been retained, managed, and restored through the North American Waterfowl Management Plan (NAWMP) to support waterfowl and other wetland dependent species. These activities are measured within NAWMP's four Habitat Joint Ventures: Pacific Coast (Canada portion only); Canadian Intermountain; Eastern Habitat; and Prairie Habitat, including the Western Boreal Forest region for the period since 1990.

Three related wetland indicators which may be useful for measuring progress are currently in development under the Canadian Environmental Sustainability Indicators (CESI) initiative. Two of the CESI indicators in development will report on the status and trends of wetlands in Canada. The third will relate to trends in management effectiveness in Ramsar sites.

2020 BIODIVERSITY GOALS AND TARGETS FOR CANADA

Goal A. By 2020, Canada's lands and waters are planned and managed using an ecosystem approach to support biodiversity conservation outcomes at local, regional and national scales.

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

Possible indicator(s):

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

Why is this target important for Canada?

Approximately 80 percent of the Canadian population currently lives in urban areas and that number is expected to reach 90 percent by 2050. The total area of urban land in Canada 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, respite from hot summer temperatures, opportunities for recreation, and more. For cities, naturalized areas not only create attractive neighbourhoods, but natural riverbanks and adequate groundcover can help with flood control and reduce storm water runoff. Municipalities are uniquely positioned to play a significant role by developing locally tailored biodiversity solutions.

*Links to the Convention on Biological Diversity Strategic Plan 2011-2020
This target for Canada is linked with the global Aichi Target 2*

Meeting the target

A number of Canadian municipalities are already working directly and indirectly on biodiversity activities through their planning, awareness-raising, decision-making, and service delivery initiatives. For example, the City of Edmonton is a leader in biodiversity protection and has made education on the importance of biodiversity a major local effort. The City has mainstreamed biodiversity through urban design and recognized the roles different stakeholders and the community can play to move sustainability and ecosystem conservation efforts forward. In addition, 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. At the provincial level, Ontario's Biodiversity Strategy 2011 highlighted the importance of biodiversity conservation in the urban context, and Quebec developed a guide on urbanization and biodiversity for planners and municipal staff that identify tools and best practices to protect biodiversity and ecosystem services in urban areas. Canada's national urban organizations, 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. In 2011 plans for Canada's first urban National Park, Rouge Park, in the Greater Toronto Area, were launched. Meeting this target will require continued and more systematic efforts to integrate biodiversity into municipal policies, plans and programmes. Progress toward this target will be measured continuously as municipalities across the country recognize the importance of biodiversity through the development of biodiversity conservation strategies and integration of biodiversity objectives in municipal plans and activities.

Key concepts

Major municipalities: Medium and large population centres, according to Statistics Canada definitions:

- small population centres, with a population of between 1,000 and 29,999;
- medium population centres, with a population of between 30,000 and 99,999;

- large urban population centres, consisting of a population of 100,000 and over.
- In 2011, Statistics Canada reported 85 medium and large population centres in Canada, and 857 small population centres.

How will progress be measured?

The two indicators proposed for this target rely on data from individual municipalities as well as municipal associations and networks. Environment Canada would work with partners to survey the municipalities associated with Canada's 85 medium and large population centres to gather the relevant data. Case studies showcasing municipal activities that integrate biodiversity considerations could also be gathered.

2020 BIODIVERSITY GOALS AND TARGETS FOR CANADA

Goal A. By 2020, Canada's lands and waters are planned and managed using an ecosystem approach to support biodiversity conservation outcomes at local, regional and national scales.

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

Possible indicator(s):

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

Why is this target important for Canada?

The effects of climate change are being noted 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 change and invasive species.

The impacts are being and will continue to be felt by Canadians across the country. In northern communities, where changes are occurring fastest, warmer ground temperatures leading to thawing permafrost are causing damage to buildings and roads and in coastal communities increasing storm frequency and intensity hasten coastal erosion and cause property damage. For an economy such as Canada's, where natural resources play an important role, the effects of climate change could be significant, affecting hunting, fishing, and forest, ocean and crop management and related industries. All communities will be impacted by these changes.

In order to develop effective adaptation measures, we first need to understand the adaptive capacity of Canada's biophysical systems; we need to know where, when and how to respond, and 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.

*Links to the Convention on Biological Diversity Strategic Plan 2011-2020
This target for Canada is linked with the global Aichi Target 19*

Meeting the target

To meet this target, governments and stakeholders across Canada will need 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 by a variety of organizations are underway. Efforts to assess and monitor ocean acidification are being undertaken by various academic organizations and non-government organizations. Under its Aquatic Climate Change Adaptation Services Program (ACCASP), Fisheries and Oceans Canada is conducting a series of aquatic basin scale assessments that, among other things, will consider both ecosystem and socio-economic climate impacts, with obvious implications for biodiversity. Through the Climate Change Adaptation Program (CCAP), Aboriginal Affairs and Northern Development Canada is supporting Aboriginal and northern communities to address risks and challenges posed by climate change impacts and to become more resilient. The Canadian Forest Service's Forest Change Initiative, when complete, will include a Tracking System to enable reporting on the effects of climate change on Canada's forests; a sustainable forest management Adaptation Toolkit composed of a range of knowledge products (e.g. maps, guidebooks, decision-support systems, etc.); and an Integrated Assessment of

the implications of climate change on Canada's forests and forest sector. The Canadian Council of Forest Ministers Climate Change Task Force is developing a suite of adaptation tools and guidebooks. Natural Resources Canada is developing an update to the National Assessment of Climate Change Impacts and Adaptation. Monitoring and reporting on changes in biodiversity over time using a variety of tracking mechanisms will be important for identifying adverse trends as a basis for developing, implementing and evaluating the effectiveness of adaptation measures.

Key concepts

Adaptive capacity: The ability of biophysical and socio-economic systems to adapt to changing circumstances on an ongoing basis.

Adaptation measures: Actions that respond to actual or potential changes in biodiversity resulting from climate change. These can include activities by institutions, governments, business or the public to respond to current or projected impacts.

Vulnerability: The degree to which an ecosystem or a socio-economic system (a populated area, for example) is susceptible to adverse impacts of climate change. Vulnerability is a function of many factors, including the nature of the impacts, the degree to which the system is exposed, its sensitivity to change, and its resilience, or ability to absorb the impact.

How will progress be measured?

The indicators proposed for this target rely on the cooperation of all jurisdictions to review and report progress. Ongoing or recently completed reports relevant to the first indicator include the joint federal, provincial, territorial Ecosystem Status and Trends Reports. The second indicator contains multiple measures, including the number and extent of plans completed, and the number and extent of plans implemented.

2020 BIODIVERSITY GOALS AND TARGETS FOR CANADA

Goal B. By 2020, direct and indirect pressures as well as cumulative effects on biodiversity are reduced, and production and consumption of Canada's biological resources are more sustainable.

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

Possible indicator(s):

- Relevant indicators drawn from the existing suite of indicators in the Canadian Council of Forest Ministers (CCFM) Criteria and Indicators (C&I) Framework

Why is this Target Important for Canada?

Forests are essential to the long term well-being of Canada's communities, economy, and environment. As stewards of 10% 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 economic benefits and are important to rural economies and livelihoods. In addition, domestic and international consumers increasingly expect that forest products will come from sustainably managed forests, and our commitment to sustainable forest management allows Canada to access markets that would otherwise be unavailable. Canada has a strong record of managing its forests sustainably but we need to build on that record in order to realize the full range of economic, environmental, and social benefits from our forests.

Links to the Convention on Biological Diversity Strategic Plan 2011-2020

This target for Canada is linked with the global Aichi Targets 4, 5 and 7.

Meeting the Target

As a world leader in sustainable forest management, Canada has taken major steps to promote SFM and will continue to do so. 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 and regulations. 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. These and other measures position Canada well to make progress on SFM by 2020.

Key Concepts

Sustainable forest management: Management that maintains and enhances the long-term health of forest ecosystems for the benefit of all living things while providing environmental, economic, social, and cultural opportunities for present and future generations. (Canadian Council of Forest Ministers, 2008)

How will Progress be Measured?

Canada is well-positioned to report on progress toward SFM with a comprehensive, science-based framework of indicators that is broadly supported by Canadian stakeholders and closely aligned with internationally-agreed frameworks of indicators for measuring progress toward SFM.

The National Framework of Criteria and Indicators of Sustainable Forest Management is used as the basis for national and international reporting and includes 6 criteria and 46 indicators that describe a range of environmental, economic,

social and cultural values. No single indicator can accurately portray progress toward sustainability. Within the framework, CFS currently reports on several indicators under the criteria “biodiversity” and “ecosystem condition and productivity”, as well as others related to the sustainable use of forest resources. Use of the C&I Framework to report on progress towards this target will reduce Canada’s reporting burden and increase the consistency of information among a number of reporting products.

2020 BIODIVERSITY GOALS AND TARGETS FOR CANADA

Goal B. By 2020, direct and indirect pressures as well as cumulative effects on biodiversity are reduced, and production and consumption of Canada's biological resources are more sustainable.

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

Possible indicator(s):

- Wildlife habitat capacity on farmland
- Environmental farm planning on agricultural land

Why is this target important for Canada?

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 types of landscapes, including cropland, pastures, grasslands, forests, wetlands and water bodies, including many undisturbed natural areas. Over the past 20 years there has been a decline in the capacity of agricultural lands to support the habitat needs of species, due in large part to the conversion of natural areas to cropland and agricultural intensification on existing farmland, as well as increased risk of nutrient contamination. 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.

*Links to the Convention on Biological Diversity Strategic Plan 2011-2020
This target for Canada is linked with the global Aichi Targets 5 and 7*

Meeting the target

Meeting this target will involve continued improvement of the management of agricultural landscapes at a number of levels. At the farm level, Canada's farmers can implement practices that increase diversity on their farm such as planting shelterbelts and windbreaks and the use of riparian buffers, and integrating practices like crop rotation, strip cropping and agroforestry which also benefit production. Municipal and Provincial governments can influence biodiversity through land use planning in the broader agricultural landscape while responding to ongoing pressures from agricultural landscape conversion, urban encroachment, transportation, industry and other uses in these landscapes that impact biodiversity. The federal government can continue to promote biodiversity conservation and foster better opportunities for farmers and all Canadians through agricultural research and innovation. At the same time, industry can continue to develop and champion agro-environmental technologies and practices that support productivity and biodiversity – such as the practices recognized by the Canadian Cattleman's Association's annual Environmental Stewardship Award.

Key concepts

Agricultural working landscapes: Land used for crops, pasture, and livestock; the adjacent uncultivated land that supports other vegetation and wildlife; and the associated atmosphere, the underlying soils, groundwater, and drainage networks.

How will progress be measured?

The first indicator proposed for this target 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. It does not cover flora, soil or invertebrates. Data for this indicator are gathered from the Canadian Census of Agriculture, thus land use outside the agricultural extent (i.e. area not included in the census of agriculture) such as forestry and urban is not included. The second indicator provides the percentage of farms in Canada that have a formal written Environmental Farm Plan, and the percent for which plans are under development.

2020 BIODIVERSITY GOALS AND TARGETS FOR CANADA

Goal B. By 2020, direct and indirect pressures as well as cumulative effects on biodiversity are reduced, and production and consumption of Canada's biological resources are more sustainable.

Target 8. By 2020, aquaculture management promotes the sustainable use of aquatic resources (including marine, freshwater and land-based) in ways that conserve biodiversity.

Possible indicator(s):

Indicators in development:

- Aquaculture under a science framework: Percentage of aquaculture managed under a science-based environmental regulatory framework

Why is this Target Important for Canada?

Aquaculture typically includes the cultivation of aquatic species, usually for commercial harvest, processing, sale and consumption. Commercial aquaculture in Canada contributes nearly 30% of the total value of Canadian fish and seafood production. Salmon is the main species farmed in Canada, making up 70% of total production volume. Aquaculture operations have been established in every Canadian province and in Yukon. Canadian aquaculture contributes more than \$2 billion of total economic activity. Canada is well positioned to benefit from sustainable aquaculture. Continued active and responsive management is essential to ensure the health of ecosystems in which aquaculture takes place. With the world's longest coastline and productive salt and freshwater resources, Canada has a reputation for safe, high-quality fish and seafood products produced in an environmentally sustainable manner. 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.

Links to the Convention on Biological Diversity Strategic Plan 2011-2020

This target for Canada is linked with the global Aichi Targets 4 and 7

Meeting the Target

Aquaculture management is an area of shared jurisdiction in Canada between the federal, provincial and territorial governments. Current initiatives include regulatory reform to increase transparency and coordination between regulatory partners. In this context, the federal and provincial/territorial governments work with industry and other stakeholders, and with Aboriginal communities and groups to advance sustainable aquaculture management. In addition, the National Aquaculture Strategic Action Plan Initiative provides a comprehensive strategic vision for the sector, which requires action on the part of all key players. To guide the pursuit of sustainable aquaculture development in Canada, the overall objective for environmental protection has been identified in this initiative as maintaining healthy and productive aquatic ecosystems as a condition for aquaculture development. Through aquaculture sustainability reporting by the Department of Fisheries and Oceans, current status and trends in aquaculture sustainability will be measured and reported.

Key Concepts

Aquatic resources: Freshwater and marine animals and plants, and their habitat.

Areas under aquaculture: Areas and sites such as freshwater ponds and lakes, bays and recycling facilities, land-based aquaculture farms and open ocean where aquatic organisms are cultivated, including finfish, molluscs, crustaceans and aquatic plants.

Sustainable use: The use of components of biological diversity in a way and at a rate that does not lead to the long-term decline of biological diversity, thereby maintaining its potential to meet the needs and aspirations of present and future generations. (Convention on Biological Diversity)

How will progress be measured?

The proposed indicator for this target would describe how aquaculture management, incorporating science advice, reduces direct and indirect pressures on biodiversity and supports the sustainable use of aquatic resources. The approach to reporting on progress would be adaptive and would be primarily reported through the Department of Fisheries and Oceans aquaculture sustainability reporting. Aquaculture sustainability indicators, providing both qualitative and quantitative information will continue to be developed.

2020 BIODIVERSITY GOALS AND TARGETS FOR CANADA

Goal B. By 2020, direct and indirect pressures as well as cumulative effects on biodiversity are reduced, and production and consumption of Canada's biological resources are more sustainable.

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

Possible indicator(s):

- Status of major fish stocks
- Sustainable fish harvest

Why is this target important for Canada?

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. In order to assure the future enjoyment of these benefits and the economic sustainability of commercial, recreational, and Aboriginal fisheries, it is important to protect and promote healthy ecosystems by avoiding destructive fishing practices, managing bycatch, recovering depleted stocks, and preventing overfishing.

*Links to the Convention on Biological Diversity Strategic Plan 2011-2020
This target for Canada is linked with the global Aichi Target 6*

Meeting the target

Canada is taking steps to ensure long-term sustainability of nationally managed fisheries by developing and implementing comprehensive fishery management plans supported by new policies and tools, monitoring, the best available science advice, and compliance and enforcement activities. The new policies and tools include those developed under the Sustainable Fisheries Framework (SFF), which provides an overarching science-based policy framework for the sustainable management of Canadian fisheries. The SFF is an adaptive framework; new policies and tools will be added over time to achieve the sustainable use of fisheries and evolve towards an ecosystem-based management approach of all fishing activity licensed and/or managed by Canada, including those outside of Canada's Exclusive Economic Zone. This will help ensure 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. Progress will be defined as measured by the national Fishery Checklist.

Key concepts

Fish and invertebrate stocks and aquatic plants: major harvested stocks managed by Fisheries and Oceans Canada (generally includes stocks with an annual landed value greater than \$1 million and/or annual landed weight greater than 2,000 tonnes).

Ecosystem Approach (for fisheries management): Management approach by which fisheries management decisions consider the impact of the fishery not only on the target species, but also on non-target species, seafloor habitats, and the ecosystems of which these species are a part. This approach also encourages management decisions to take into account changes in the ecosystem which may affect the species being fished. This includes the effects of climate and climate change, and the interactions of target fish stocks with predators, competitors, and prey species. The ecosystem approach to fisheries management also provides that management decisions consider the needs and concerns of people who rely on and interact with the ecosystem.

How will progress be measured?

Both of the indicators proposed for this target are currently reported on under the Canadian Environmental Sustainability Indicators (CESI) initiative. The first indicator reports the classification of 155 major fish stocks as

“healthy,” “cautious” or “critical” categories. Information on aquatic plants is not included. The second indicator is based on the number of major stocks harvested relative to approved levels. Additional information on both of the proposed indicators is available at the following URL: <http://www.ec.gc.ca/indicateurs-indicators>.

2020 BIODIVERSITY GOALS AND TARGETS FOR CANADA

Goal B. By 2020, direct and indirect pressures as well as cumulative effects on biodiversity are reduced, and production and consumption of Canada's biological resources are more sustainable.

Target 10. By 2020, nutrient levels are stabilized or reduced in lakes of the major drainage areas of Canada.

Possible indicator(s):

- Phosphorus levels in the Great Lakes
- Phosphorous levels in the St. Lawrence River

Why is this target important for Canada?

Phosphorus 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. Elevated levels of phosphorous and other nutrients 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 have accelerated eutrophication and growth of aquatic plants and algae. 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. In Canada, phosphorus concentrations between 1990 and 2006 rose in over 20 percent of the water bodies sampled, including some of the Great Lakes where, 20 years ago, regulations successfully reduced nutrient inputs. Severe algal blooms in Lake Winnipeg, Lake Simcoe and blooms of cyanobacteria in eastern Canadian lakes have been occurring in recent years, as well as re-emerging problems in Lake Ontario and 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 for decades. In addition to ensuring the conditions required to support aquatic biodiversity, protecting Canada's water sources from excess nutrient loading 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 our social and economic activity.

Links to the Convention on Biological Diversity Strategic Plan 2011-2020

This target for Canada is linked with the global Aichi Target 8

Meeting the target

Achieving this target will involve coordinating efforts to understand multiple sources and respond to eutrophication. Bilateral coordination between Canada and the United States will also be needed as eutrophication of some Canadian waterways is heavily influenced by practices in the U.S. This target will aim to reduce nutrients in order to protect and enhance the quality of water so that it is clean, safe and secure for all Canadians and supports healthy ecosystems.

Key concepts

Eutrophication (or hypertrophication): Also known as nutrient enrichment, eutrophication is the result of large amounts of nutrients being released into a water body leading to excessive amounts of aquatic plant growth. Most often, the nutrient phosphorous has the greatest effect on eutrophication because it tends to be more limited within freshwater environments. However, some environments are nitrogen deficient and more greatly influenced by changing levels of nitrogen. Over time, this excessive plant growth can naturally turn a lake into a bog and eventually into land. However, eutrophication can be accelerated by the release of nutrients from human activities such as from fertilizers used in agriculture and in our homes. This rapid transition is not beneficial for the fish and other organisms which live in lakes who have to cope with depleted oxygen levels because of the decomposition of plants, as well as changing biodiversity and species abundance.

How will progress be measured?

Both of the indicators proposed for this target are currently reported on under the Canadian Environmental Sustainability Indicators (CESI) initiative. The first indicator compares average spring total phosphorus concentrations in

the four Canadian Great Lakes to their water quality objectives to determine the status of phosphorus concentrations in offshore waters in each lake. The second indicator provides a measure of how frequently phosphorus concentrations exceed Quebec's water quality phosphorus guideline for the protection of aquatic life in the St. Lawrence River. Additional information on both of these indicators is available at the following URL: <http://www.ec.gc.ca/indicateurs-indicators>.

2020 BIODIVERSITY GOALS AND TARGETS FOR CANADA

Goal B. By 2020, direct and indirect pressures as well as cumulative effects on biodiversity are reduced, and production and consumption of Canada's biological resources are more sustainable.

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

Possible indicator(s):

- Number of known new invasive alien species in Canada, by Federal Regulatory Status
- Percent of federally regulated foreign invasive alien species not established in Canada

Why is this target important for Canada?

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. IAS in Canada account 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 have not yet been detected. There is a need to improve our 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 harmful species of plants, animals, and micro-organisms that have been relocated to environments outside of their natural past or present distribution and whose introduction or spread threatens the environment, the economy or society. Some of the better-known examples in Canada include 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 hitchhikers on imported goods, like fruit, as stowaways in transportation or on the bottom of ships, or disease in wildlife. A key goal of this invasive alien species target and Canada's *Invasive Alien Species Strategy* is to avoid the introduction and establishment of such species in future.

Links to the Convention on Biological Diversity Strategic Plan 2011-2020
This target for Canada is linked with the global Aichi Target 9

Meeting the target

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 legislative and regulatory measures underpin the Strategy including: *Plant Protection Act, Pest Control Products Act, Transportation of Dangerous Goods Act, Fisheries Act, Canada Wildlife Act, Wild Animal and Plant Protection and Regulations of International and Interprovincial Trade Act*, and others. Provincial legislation and measures are also in place. 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. Aboriginal governments, municipalities, and other stakeholders are also important contributors in responding to the challenges of invasive alien species. Invasive alien species councils, for example, established in 11 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.

Key concepts

Establishment: The process of an alien species in a new habitat successfully producing viable offspring with a likelihood of continued survival

Invasive alien species: An alien species whose introduction and/or spread threatens biological diversity, ecosystems, economies or human health

Introduction: The movement by human action, indirect or direct, of an alien species outside of its natural range (past or present). This movement can be either within a country or between countries or areas beyond national jurisdiction

Pathway: Any means that allows the entry or spread of a pest

Pest: Any species, strain or biotype of plant, animal or pathogenic agent injurious to plants or plant products

Priority species: Species that significantly impact biodiversity, present a high level of risk, and may be addressed in a cost effective manner.

Priority pathway: Pathways that have a significant impact on biodiversity, present a high level of risk, and may be addressed in a cost effective manner.

How will progress be measured?

The indicators proposed for this target are part of the Canadian Environmental Sustainability Indicators (CESI) program, which provides data and information to track Canada's performance on key environmental sustainability issues.

The number of known new IAS includes all foreign IAS (whether regulated or not by the federal government) identified as having become *established* in Canada each year subsequent to the baseline date of January 2012, and identifies the type (regulated, non-regulated, unknown) and name of the pathway that brought them to Canada, if known.

The percentage of federally regulated foreign IAS not established in Canada reports the number of regulated foreign IAS *not established* in Canada as a percentage of the total number of regulated foreign IAS from the start of that year. This indicator represents the success of preventing the establishment of foreign regulated IAS in Canada.

The information relevant for reporting on both indicators will rely on contributions from existing data collection activities, knowledge and networks. The data will be collected from departments/agencies involved with the regulation, identifying and/or researching IAS. Data for both indicators will be included in one database and will be updated annually by each contributing department.

2020 BIODIVERSITY GOALS AND TARGETS FOR CANADA

Goal B. By 2020, direct and indirect pressures as well as cumulative effects on biodiversity are reduced, and production and consumption of Canada's biological resources are more sustainable.

Target 12. By 2020, innovative mechanisms for fostering the conservation and sustainable use of biodiversity are developed and applied.

Possible indicator(s):

- Case studies which showcase the conservation and/or sustainable use of biodiversity through innovative mechanisms, in sectors and regions across Canada.

Why is this target important for Canada?

Biodiversity generates and supports many valuable ecosystem services that provide an enormous range of social and economic 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. 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 (and potentially enhancing) competitiveness. And they can be applied in a wide range of ecosystem settings – from private woodlots and ranches, to public forests and downtown neighbourhoods. 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 could achieve much.

Links to the Convention on Biological Diversity Strategic Plan 2011-2020

This target for Canada is linked with the global Aichi Targets 3 and 4

Meeting the target

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. For example, both the federal and some provincial governments offer tax benefits for land donations under initiatives such as the *Ecological Gifts Program*. In Saskatchewan, Ducks Unlimited has led an innovative “reverse auction” to pay landowners for restoring wetlands in their fields and pastures, as a mechanism to restore 56,000 hectares of wetlands over 20 years. A group of non-governmental organizations and forestry companies worked hand in hand to craft the Canadian Boreal Forest Agreement. Initiatives such as third-party certification programs can help develop markets for biodiversity-friendly products. And companies like Sobeys and Unilever are leading the way by greening their supply chains.

Meeting this target will involve continuing efforts such as those described above, 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.

Key concepts

Innovative mechanisms: A novel tool or approach to achieving biodiversity outcomes. An innovative mechanism may be developed or applied by any sector or level of government. Examples may include, but aren't limited to:

- New multi-stakeholder or public-private partnerships
- Economic instruments, such as grants, tax measures, or payments for ecosystem services
- Market-based incentives, such as certification programs

- Enhanced legislative or regulatory measures, such as conservation allowances
- Policies or programs, including corporate policies, designed to deliver new biodiversity benefits

How will progress be measured?

Progress on this target would be measured by documenting Canadian examples of innovative approaches and tools for biodiversity conservation. Case studies would be drawn from a variety of sources as part of the process for developing Canada's National Reports to the Convention on Biological Diversity. Reporting would highlight a cross-section of novel examples from different sectors and regions of Canada and will recognize and celebrate successes.

2020 BIODIVERSITY GOALS AND TARGETS FOR CANADA

Goal C. By 2020, Canadians have easy access to adequate and relevant information about biodiversity and ecosystem services to support conservation planning and decision-making.

Target 13. By 2020, the science base for biodiversity is enhanced and knowledge of biodiversity, including traditional and community knowledge, is better integrated and more accessible.

Possible indicator(s):

- Completion of a national assessment of biodiversity science required to address policy needs
- The number of peer-reviewed reports written by 2020 which contribute to addressing key biodiversity science needs
- The number of products available by 2020 that synthesize key biodiversity science and knowledge for the public

Why is this target important for Canada?

Information is key when it comes to understanding biodiversity. In order to improve our 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 Canada's ecosystems and species is needed, in a form that is easily accessible to decision-makers. This requires information gathered from a wide range of disciplines, and from the traditional and local knowledge of aboriginal peoples and others.

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

Links to the Convention on Biological Diversity Strategic Plan 2011-2020

This target for Canada is linked with the global Aichi Targets 18 and 19

Meeting the target

Ongoing research will be 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 our biodiversity knowledge base will involve harnessing the advantages of innovation, enabling greater potential for collaboration between governments, citizen science initiatives, Aboriginal groups, universities and private sector organizations. New technologies are transforming the ways knowledge is created and shared and facilitating policy integration within and across sectors and jurisdictions. These technologies also provide the opportunity to develop a knowledge infrastructure with a shared science base, decision support tools, best practices and innovative governance. Biodiversity-sensitive decision-making from local to national levels will require just such an infrastructure to develop and thrive.

Key concepts

Science base for biodiversity/knowledge of biodiversity: Any information that has been processed to support dialogue on biodiversity and ecosystem services management and better decision making.

How will progress be measured?

The three indicators proposed for this target would all rely on the cooperation of all jurisdictions. A specific definition of the term "products" (used in the third indicator) is being developed and is meant to include a variety of possible formats, including web pages, portals, print and social media. It should be noted that none of the currently proposed indicators explicitly address traditional or community knowledge. Additional collaboration with Aboriginal organizations is needed to explore the development of an appropriate indicator for traditional knowledge.

2020 BIODIVERSITY GOALS AND TARGETS FOR CANADA

Goal C. By 2020, Canadians have easy access to adequate and relevant information about biodiversity and ecosystem services to support conservation planning and decision-making.

Target 14. By 2020, Canada has a comprehensive inventory of protected spaces that includes private conservation areas.

Possible indicator(s):

- The establishment of a centralized comprehensive inventory.
- The number and/or nature of new elements and/or methods that are incorporated into Canada's protected spaces tracking and reporting system.

Why is this target important for Canada?

Canada is a leader in protecting and conserving natural spaces. 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 Aboriginal and local community conserved areas. The Canadian Council on Ecological Areas, currently 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 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.

Links to the Convention on Biological Diversity Strategic Plan 2011-2020
This target for Canada is linked with the global Aichi Targets 11 and 19

Meeting the target

A number of systems exist for tracking different conservation initiatives, and developing a comprehensive inventory will involve 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 will enhance Canada's ability to report on our collective conservation efforts by contributing to a comprehensive inventory of protected spaces.

Key concepts

Private conservation areas: Privately owned areas that are legally protected in perpetuity for the purposes of conservation (e.g. conservation easements). These sites may or may not meet the IUCN criteria for protected areas.

Protected area: A clearly defined geographical space, recognized, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values (International Union for Conservation of Nature definition).

Protected spaces: Areas set aside for the purposes of biodiversity conservation, either through government, private or co-managed efforts.

Other effective area-based conservation measures: Spatially explicit measures that provide a net conservation benefit, but are not formally designated protected areas. Specific screening criteria for these measures are to be developed.

How will progress be measured?

The indicators proposed for this target would report on the establishment of a comprehensive inventory of and corresponding improvements to Canada's ability to report on protected spaces. While data on the majority of Canada's protected spaces is currently available through the Conservation Areas Tracking and Reporting System (CARTS), being able to tell the whole story will require the integration of additional data on conservation areas that is not currently reported, either into a single database or into separate but related databases. Efforts to establish a mechanism to report on Canada's protected spaces comprehensively will be ongoing toward the target date. The first indicator would reflect the achievement of this objective. As Canada's ability to measure and report on conservation areas is improved and expanded, the second indicator would be used to track and report on advances, which could include, for example, improved guidelines for applying IUCN protected areas categories, enhanced quality of maps of conservation areas, and increased specificity in the types of conservation areas tracked and reported.

2020 BIODIVERSITY GOALS AND TARGETS FOR CANADA

Goal C. By 2020, Canadians have easy access to adequate and relevant information about biodiversity and ecosystem services to support conservation planning and decision-making.

Target 15. 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.

Possible indicator(s):

- The number of individual elements of natural capital for which Statistic Canada has published national-scale data tables.
- The number and extent of individual elements of natural capital for which Statistic Canada has published national-scale map layers.
- The number of ecosystem services for which there is national-scale data.

Why is this target important for Canada?

Canada's natural resource wealth plays a significant role in generating income, exports, and employment. Natural capital – the physical land, natural resources and ecosystems – is the context within which ecosystem processes and functions occur. Among the outcomes of these processes and functions are ecosystem services which provide essential benefits to humans. These services can be understood as a valuable result of Canada's natural wealth but they are rarely accounted for in resource management, which has resulted in significant, measured degradation and loss.²

Canada currently has no established system for measuring aspects of natural capital that extend beyond harvestable or extractable natural resources and some forms of land (that which is bought and sold). Canada also does not currently have a system for measuring ecosystem services, which are very complex. Internationally, this issue is being addressed in the *System of Environmental and Economic Accounts (SEEA) Experimental Ecosystem Accounts*, a project of the United Nations Statistical Commission. This project seeks to define how countries could measure natural capital and ecosystem services using a range of measures that can be monetary, physical, and condition-based metrics. 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 ecosystems and human well-being.

Links to the Convention on Biological Diversity Strategic Plan 2011-2020
This target for Canada is linked with the global Aichi Target 2

Meeting the target

The objective of this target 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.

Statistics Canada currently measures some stocks and flows related to natural capital in physical terms and, where feasible and appropriate, in monetary terms. Their system of resource and environmental accounts provide a framework through which ecosystem services could be accounted. The accounts have been progressively developed over time, and are currently focussed on measuring traditional natural resources, energy, water, land and greenhouse gas emissions. Research is being carried out on accounts for ecosystems as methods and data for measuring these become more available. When complete, the accounts will provide a robust basis on which to understand the evolution of Canada's natural capital and its contribution to well-being.

² United Nations. 2005. Millennium Ecosystem Assessment. www.maweb.org Accessed July 31, 2012

<http://ebooks.cambridge.org/chapter.jsf?bid=CBO9780511750458&cid=CBO9780511750458A013> Accessed July 31, 2012

Key concepts

Natural Capital: Natural Capital is a term that was developed to help illustrate how the physical natural environment, including ecosystem functions and processes, is a valuable asset to human society and should be reflected in decision processes along with other assets. Natural capital produces what are referred to as “ecosystem services” which have benefits for humans. These benefits include essential life support and significant quality-of-life services.

Ecosystem Services: The natural processes of healthy functioning ecosystems (see Natural Capital) result in the provision of many essential benefits that humans depend upon, including basic life support and quality-of-life. These functions are said to “provide services” to humans because of the benefits that humans derive from them. Ecosystem services include the materials that ecosystems provide (e.g. food, fuel, fibre, medicine); the ways that ecosystems regulate environmental conditions (e.g. clean the air and water, prevent soil erosion, reduce the spread of disease, mitigate impacts of climate); and their contributions to cultural life (e.g. education, recreation, inspiration, physical and mental health including cognitive development).

Indicators for measuring progress

The proposed approach to indicators for this target is an adaptive one that would be primarily reported through Statistics Canada. In the beginning, the three indicators of progress towards achieving this target would be:

1. The number of individual elements of natural capital for which Statistic Canada has published national-scale data tables.
2. The extent/number of individual elements of natural capital for which Statistic Canada has published national-scale map layers.
3. The number of ecosystem services for which there is national-scale data.

As work develops, Statistics Canada would, in collaboration with other federal, provincial, and territorial government departments, assess the need for adapting these indicators to the improving state of knowledge and information being collected to support them. Departments will begin by establishing a checklist of possible elements of natural capital to be included in the data tables and map layers in Indicators 1 and 2. Through its involvement in the UN SEEA Experimental Ecosystem Accounts, Statistics Canada will adopt the Common International Classification for Ecosystem Services (CICES) for identifying the checklist of ecosystem services that would be the focus of national-scale data in Indicator 3.

2020 BIODIVERSITY GOALS AND TARGETS FOR CANADA

Goal D. By 2020, Canadians are informed about the value of nature and more actively engaged in its stewardship.

Target 16. By 2020, biodiversity is integrated into the elementary and secondary school curricula.

Possible indicator(s):

- The number of jurisdictions who have integrated biodiversity into elementary and secondary curricula.

Why is this target important for Canada?

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.

Links to the Convention on Biological Diversity Strategic Plan 2011-2020

This target for Canada is linked with the global Aichi Target 1

Meeting the target

Provincial and Territorial educational systems will be the key vehicle for integrating biodiversity issues into the formal curriculum documents. Efforts are already underway in various institutions across the country. In Ontario, for example, integrating biodiversity into curricula for Kindergarten to Grade 12 is included as a target in the provincial Biodiversity Strategy.

The Council of Ministers of Education offers another vehicle for encouraging the integration of biodiversity into elementary and secondary school curricula through, for example, their Pan-Canadian Education for Sustainable Development Framework for Collaboration and Action.

Integration into formal curricula can be 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, such as Envirothon.

Key concepts

Curriculum documents: Define what students are taught in publicly funded schools. They detail the knowledge and skills that students are expected to develop in each subject at each grade level, and sets standards for the provinces and territories.

Mainstreaming: Integrating biodiversity considerations, specifically the conservation and sustainable use of biodiversity, into everyday decisions across all sectors of society, from the choices of individuals, to operational and investment decisions by private business, to public policy decisions.

How will progress be measured?

The indicator proposed for this target relies on data from provinces and territories. Data on the integration of biodiversity into elementary and secondary curricula would be gathered from provincial and territorial Ministries of Education. Case studies showcasing informal education activities related to biodiversity could also be gathered by Environment Canada, provinces and territories.

2020 BIODIVERSITY GOALS AND TARGETS FOR CANADA

Goal D. By 2020, Canadians are informed about the value of nature and more actively engaged in its stewardship.

Target 17. By 2020, more Canadians participate in biodiversity conservation activities.

Possible indicator(s):

- Percentage of Canadians who report that they take definite action to protect the environment.
- Participation in volunteer-based bird surveys.

Why is this target important for Canada?

Many Canadians are becoming more active in biodiversity conservation efforts. Everyone has a part to play and an opportunity to lead by example. The benefits of biodiversity are also extending beyond the individual and are being considered within business plans, in green schools, on stages, in art galleries and in urban management plans. Moreover, achieving our biodiversity goals requires extensive collaboration and cooperation by all parts of society. This includes all levels of government, Aboriginal peoples, educational and scientific institutions, environmental non-government organizations, business, individual citizens and youth.

Participation in biodiversity conservation activities could be a good indicator of how Canadians understand and value biodiversity. The number of Canadians who willingly participate in, and seek out, biodiversity conservation activities can also indicate their interest in biodiversity in their home, backyard and communities. Participation takes many forms and includes stewardship, 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.

*Links to the Convention on Biological Diversity Strategic Plan 2011-2020
This target for Canada is linked with the global Aichi Targets 1 and 4*

Meeting the target

Canada has gained an international reputation for its strong stewardship and volunteer programs. There are millions of active environmental stewards in Canada, along with several thousand organizations dedicated to preserving biodiversity through a broad range of activities. The contribution these individuals and groups make to biodiversity is invaluable. Countless efforts to engage Canadians in biodiversity conservation are underway across the country, particularly at the local and regional level, through local environmental organizations and volunteer programs, through government-run conservation programs such as EcoAction and the Habitat Stewardship Program.

Canadians are also contributing to our understanding of species through a variety of citizen science programs. These include bird-monitoring programs such as the Breeding Bird Survey, which began in 1966 and is one of the oldest surveys of its kind in North America. Other citizen science programs include Frogwatch, which uses frogs and toads as indicator species for monitoring the health of wetlands, and Plantwatch, which records flowering times as an important indicator of a changing climate.

Private, public and non-governmental organizations are all key players in getting Canadians involved. Participation can be tracked by examining trends in behaviour, such as participation in relevant biodiversity related activities and programs.

Key concepts

Biodiversity conservation activities: The actions of communities, groups or individuals which contribute to or facilitate the conservation of nature including, for example, stewardship of natural areas, restoring habitat, reducing direct pressures on biodiversity, enhancing knowledge or understanding of the natural world and what can be done to conserve it, or increasing awareness of biodiversity values.

How will progress be measured?

The indicators proposed for this target rely on data from Statistics Canada, Environment Canada and possibly others. Statistics Canada's Households and the Environment Survey provides data on the percentage of Canadians who report that they take definite action to protect the environment. Environment Canada and partners would provide data on volunteer-based bird surveys, including eBird (a checklist program), Christmas Bird Counts, Breeding Bird Survey, Breeding Bird Atlases, Project FeederWatch, Project NestWatch, and possibly many others. Case studies showcasing Canadians' participation in biodiversity conservation activities could also be gathered by Environment Canada, provinces and territories.