



# Data Sources and Methods for the Status of Key Findings Related to the Health of Canada's Ecosystems Indicator

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# 1 Introduction

The Status of Key Findings Related to the Health of Canada's Ecosystems indicator is a part of the Canadian Environmental Sustainability Indicators (CESI) program, which provides data and information to track Canada's performance on key environmental sustainability issues.

## 2 Description and rationale of the Status of Key Findings Related to the Health of Canada's Ecosystems indicator

### 2.1 Description

The Status of Key Findings Related to the Health of Canada's Ecosystems indicator is based on a simple calculation of the percentage of 20 of the key findings from *Canadian Biodiversity: Ecosystem Status and Trends 2010* (available from: <http://biodivcanada.ca/default.asp?lang=En&n=83A35E06-0>) that are rated as healthy, of concern and impaired. It also summarizes the percentage of those 20 key findings that are considered to be improving and getting worse.

The 20 key findings covered by this indicator are:  
12 aspects of ecosystems (forest, grassland, wetland, lake and river, coastal and marine biomes; ice across biomes; agricultural landscapes as habitat; species of special interest; primary productivity; natural disturbances; food webs);  
and 8 human/ecosystem interactions (protected areas; stewardship; invasive non-native species; contaminants; nutrient loading and algal blooms; acid deposition; climate change; ecosystem services).

### 2.2 Rationale

Through determining and measuring the status and changes in living organisms and the ecological complexes of which they are a part, scientists monitor biodiversity. Biodiversity monitoring is important because it "provides a basis for evaluating the integrity of ecosystems, their responses to disturbances, and the success of actions taken to conserve or recover biodiversity".<sup>1</sup> The Status of Key Findings Related to the Health of Canada's Ecosystems indicator is based on the status of key findings presented in *Canadian Biodiversity: Ecosystem Status and Trends 2010* (available from: <http://biodivcanada.ca/default.asp?lang=En&n=83A35E06-0>) because they represent the most comprehensive compilation, to date, of the results of Canada's ecosystem-level biodiversity research and monitoring.

## 3 Data

### 3.1 Data source

The data for this indicator are taken from *Canadian Biodiversity: Ecosystem Status and Trends 2010* (available from: <http://biodivcanada.ca/default.asp?lang=En&n=83A35E06-0>), a report prepared under a steering committee of representatives from Canada's federal, provincial and territorial governments. The status and trend associated with each key finding and a description of the criteria used to rank each status and trend is provided in the report's Synthesis of Key Findings (available from:

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<sup>1</sup> Federal, provincial and territorial governments of Canada (2010) *Canadian Biodiversity: Ecosystem Status and Trends 2010* (available from: <http://www.biodivcanada.ca/default.asp?lang=En&n=6F7EB059-1&wsdoc=A519F000-8427-4F8C-9521-8A95AE287753>). Page 104. Retrieved on 18 January, 2012.

[http://biodivcanada.ca/default.asp?lang=En&n=9CE2301E-1&offset=5&toc=show#\(legend\)](http://biodivcanada.ca/default.asp?lang=En&n=9CE2301E-1&offset=5&toc=show#(legend))), along with an indication of the confidence in the assessment rating.

### 3.2 Spatial coverage

The information used to compile the technical background reports behind *Canadian Biodiversity: Ecosystem Status and Trends 2010* (available from: <http://biodivcanada.ca/default.asp?lang=En&n=83A35E06-0>) comes from national, regional and local monitoring programs and scientific literature as applicable and available. Spatial coverage varies among key findings, and monitoring coverage is poor for less populated and harder-to-access regions.

### 3.3 Temporal coverage

The report used to compile this indicator, *Canadian Biodiversity: Ecosystem Status and Trends 2010* (available from: <http://biodivcanada.ca/default.asp?lang=En&n=83A35E06-0>) was published in, and is considered current as of, 2010. Temporal coverage varies both because meaningful time frames are different for different aspects of ecosystems, and because the availability of suitable data was different for each key finding.

### 3.4 Data completeness

This indicator relies on the information compiled for *Canadian Biodiversity: Ecosystem Status and Trends 2010*. As discussed in key finding #21 of that report, long-term, standardized, spatially complete, and readily accessible monitoring information, complemented by ecosystem research, although desirable, is unavailable for many of the topics addressed in *Canadian Biodiversity: Ecosystem Status and Trends 2010*. Piecing together information from many disparate sources is currently the only way to assess ecosystem status and trends.<sup>2</sup> The level of confidence assigned to each key finding in the report reflects, in part, the completeness of available information.

## 4 Method

The *Canadian Biodiversity: Ecosystem Status and Trends 2010* (available from: <http://biodivcanada.ca/default.asp?lang=En&n=83A35E06-0>) report was prepared through a collaborative effort of the federal, provincial and territorial governments of Canada. It presents 22 key findings that emerged from the synthesis and analysis of background technical reports (available from: <http://biodivcanada.ca/default.asp?lang=En&n=137E1147-1>) that were prepared through the collaboration of over 500 experts. Each key finding was assigned a status, trend and estimate of confidence rating, and underwent a review process. The status and trend ratings of 20 of those 22 key findings were used in calculation of the Status of Key Findings Related to the Health of Canada's Ecosystems indicator. The two key findings of the report that were excluded from calculation of the indicator are related to the interface between ecosystem science and policy.

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<sup>2</sup> Federal, provincial and territorial governments of Canada (2010) *Canadian Biodiversity: Ecosystem Status and Trends 2010* (available from: <http://www.biodivcanada.ca/default.asp?lang=En&n=6F7EB059-1&wsdoc=A519F000-8427-4F8C-9521-8A95AE287753>). Pages 104 and 105. Retrieved on 18 January, 2012.

The following criteria were used in assessment the status of key findings:

Status	Ecosystem aspects	Human activities
healthy	likely to persist and likely able to recover from disturbances	actions adequate for conservation or showing good progress, or stressor not causing major impacts
of concern	showing signs of stress	showing signs of insufficient actions, or signs of major impacts from stressor
impaired	outside of range of natural variation, unstable, or likely not recovering	poor progress or insufficient actions, or stressors causing major impacts

The percentage of the 20 key findings assessed as healthy, of concern, impaired and undetermined was calculated. Each key finding was allocated one point. In cases where a key finding was given two status ratings, each rating was given equal weight and assigned 0.5 points. For example, for the coastal biome key finding, less developed coasts are healthy (and thus assigned 0.5 points in the healthy category) while developed coasts are impaired (thus assigned 0.5 points in the impaired category).

The percentages of the 20 key findings with an improving trend (at a rapid and a slow to moderate rate) or little change, a worsening trend (at a rapid and a slow to moderate rate), and an unknown trend were calculated. Each key finding was allocated one point. Some key findings were given two trend ratings because they are improving in some ways or areas, but getting worse in others. In these cases, each rating was given equal weight and assigned 0.5 points. For example, for the contaminants key finding, pollution by legacy contaminants was rated as declining (thus assigned 0.5 points in the improving category), while emerging contaminants were assessed as increasing (thereby receiving 0.5 points in the getting worse category).

## 5 Caveats and limitations

While the percentage of key findings presented in *Canadian Biodiversity: Ecosystem Status and Trends 2010* assigned to each status category gives an indication of the status of Canada's ecosystems, a key finding is not equivalent to an ecosystem. Therefore, when we say, for example, that 50% of the key findings in *Canadian Biodiversity: Ecosystem Status and Trends 2010* are of concern, it does not necessarily follow and would be misleading to say that 50% of Canada's ecosystems are of concern. Key findings were used for this indicator because available data were not sufficient for a systematic assessment of ecosystem health across Canada.

The calculation of this indicator as a percentage with each key finding of equal weight is not meant to imply equivalence in importance among key findings, or equivalence in confidence among key findings. An evaluation of the adequacy of the spatial and temporal coverage supporting evidence is displayed under "Confidence in Finding" in the Synthesis of Key Findings (available from: <http://biodivcanada.ca/default.asp?lang=En&n=9CE2301E-1&offset=5&toc=show#legend>). Key findings with all levels of confidence, from low to high, are included in the indicator.

Finally, the key findings of *Canadian Biodiversity: Ecosystem Status and Trends 2010* are based on, and limited to, the information collected for this project. One of that report's key findings, #21, stresses that long-term, standardized, spatially complete, and readily accessible monitoring information, complemented by ecosystem research for assessment of status and

trends, is lacking. Monitoring of biodiversity and ecosystems over a long time period and/or at the national level is rare. Lack of this type of information hindered the report's development. It is also possible that important issues or datasets may have been missed in the analysis.

This indicator is based on 20 of the 22 key findings of *Canadian Biodiversity: Ecosystem Status and Trends 2010*. The two key findings of the report that were excluded from calculation of the indicator are related to the interface between science and policy.

## 6 References and further reading

Federal, provincial and territorial governments of Canada (2010) Canadian Biodiversity: Ecosystem Status and Trends 2010. Retrieved on 18 January, 2012. Available from: <http://www.biodivcanada.ca/default.asp?lang=En&n=6F7EB059-1&wsdoc=A519F000-8427-4F8C-9521-8A95AE287753>.

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Environment Canada (2006) A Biodiversity Outcomes Framework for Canada. Retrieved on 24 January, 2012. Available from: <http://www.biodivcanada.ca/default.asp?lang=En&n=6F7EB059-1&wsdoc=97CAAE4C-EDED-4B4D-8930-A50FD0B2ACEF>.

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