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# Data Sources and Methods for the Global Trends in Protected Areas Indicator

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## Table of Contents

### **Data Sources and Methods for the Global Trends in Protected Areas Indicator**

1.	Introduction.....	4
2.	Description and rationale of the Global Trends in Protected Areas indicator .....	4
2.1	Description.....	4
2.2	Rationale .....	4
3.	Data .....	4
3.1	Data source.....	4
3.2	Spatial coverage .....	4
3.3	Temporal coverage.....	5
3.4	Data completeness.....	5
3.5	Data timeliness.....	5
4.	Methods.....	5
5.	Caveats and limitations .....	7
6.	References and further reading.....	7
6.1	References.....	7
6.2	Further reading.....	7

## 1. Introduction

The [Global Trends in Protected Areas](#) indicator is 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 Global Trends in Protected Areas indicator

### 2.1 Description

The Global Trends in Protected Areas indicator reports on the terrestrial and marine area afforded protection for conservation in 10 selected countries. Information on protected areas is collected, analyzed and made available by the World Database on Protected Areas (WDPA) to support a number of international reporting initiatives. The WDPA is a joint project of the United Nations Environment Programme (UNEP) and the International Union for Conservation of Nature (IUCN), facilitated by the UNEP World Conservation Monitoring Centre (UNEP-WCMC), and is the data repository for the United Nations List of Protected Areas.

The internationally accepted definition of a protected area is "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."<sup>1</sup>

An annual assessment is conducted by the UNEP-WCMC to support reporting on progress towards the Millennium Development Goals and the targets of the Convention on Biological Diversity.

### 2.2 Rationale

The area of land and water that is protected is a measure of human response to the loss of biodiversity and natural habitat. The indicator shows the area protected and percentage of protected area for 10 selected countries, including Canada. The comparison set consists of the countries in the G7 (Canada, France, Germany, Italy, Japan, the United Kingdom, the United States), the Russian Federation (a large northern country like Canada), Australia (the population, population density and territorial extent of which are similar to Canada's) and Sweden (which has a similar climate). Differences between WDPA and Canadian estimates for Canada's national area protected are due to several factors outlined in section [5. Caveats and Limitations](#).

## 3. Data

### 3.1 Data source

The World Database on Protected Areas (WDPA) contains data from governments and non-governmental organizations. Elements of a summary analysis of the WDPA made by United Nations Environment Programme World Conservation Monitoring Centre (UNEP-WCMC) in 2014 for the Protected Planet 2014 report were used to create the indicator.

### 3.2 Spatial coverage

Coverage is global.

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<sup>1</sup> Dudley N (ed.) (2013) [Guidelines for Applying Protected Area Management Categories](#). IUCN: Gland, Switzerland, page 8. Retrieved on 10 December, 2014.

### 3.3 Temporal coverage

The WDPA is continually being updated and is made available on [Protected Planet](#).<sup>2</sup> A major update was completed in 2014, following a request by the Convention on Biological Diversity to the Parties to the Convention ([SCBD/SAM/DC/RH/83023](#)) for updates to the United Nations List on Protected Areas. Information on individual protected areas includes their date of establishment.

### 3.4 Data completeness

The WDPA is compiled by UNEP–WCMC from data provided by protected area authorities relevant to the governance type of the protected area. For example, government agencies provide data on federal protected areas, sub-national agencies provide data on sub-national areas, non-governmental organizations may provide data on protected areas they own and manage, communities may provide data on the areas they protect and manage, and so on. The capacity, methods and formats of data management vary within and between data providers; therefore, the WDPA is a mosaic of geographic information system (GIS) data at varying levels of completeness, resolution and quality. Nevertheless, data accepted by the WDPA must meet a minimum [standard](#).

Protected areas with unknown location and/or extent are excluded from the GIS analysis and statistics. Protected areas with unknown year of establishment are included in the GIS analysis and statistics from the earliest year reported and for every subsequent year reported.

Analyses of marine protection are conducted for the territorial sea<sup>3</sup> and exclusive economic zone<sup>4</sup> (EEZ) of each country, as well as for the global ocean; claimed areas of continental shelf are not considered. Disputed land and sea that are covered by protected areas are included as a group on their own and are included in global totals, but not in national statistics. Similarly, the Great Lakes, Caspian Sea and Aral Sea are excluded from national but not global totals.

Man and the Biosphere (MAB) Reserves were excluded on the advice of the United Nations Educational, Scientific and Cultural Organization (UNESCO) Man and the Biosphere Programme in which they have stated only the core zone of MAB Reserves may be considered protected. These zones are not well defined in the WDPA, and the effect of their exclusion is small as they often overlap with other types of protected areas.

### 3.5 Data timeliness

Statistics were compiled for the [Protected Planet Report 2014](#) using the August 2014 version of the WDPA.

## 4. Methods

The World Database on Protected Areas (WDPA) is held within a geographic information system (GIS) that stores information about protected areas, including attributes such as their name, designation, date of designation, and documented area, as well as their geographic location as a point and/or boundary.

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<sup>2</sup> Some countries restrict the redistribution of their data; these data are not available publicly.

<sup>3</sup> Territorial sea is defined as the area of the sea from the shoreline out to 12 nautical miles. Fisheries and Oceans Canada (2014) [Canada's Ocean Estate: A Description of Canada's Maritime Zones](#). Retrieved on 10 December, 2014.

<sup>4</sup> The exclusive economic zone is an area of the sea adjacent to and beyond the territorial sea, extending out to 200 nautical miles from low water lines. See Fisheries and Oceans Canada (2014) [Canada's Ocean Estate: A Description of Canada's Maritime Zones](#). Retrieved on 10 December, 2014.

Quality control criteria are applied to ensure consistency and comparability of the data in the WDPA. New data are validated at the United Nations Environment Programme World Conservation Monitoring Centre (UNEP–WCMC) in coordination with the World Commission on Protected Areas and the data provider as well as local experts. Discrepancies between the data in the WDPA and new data are resolved in communication with data providers. Processed and validated data are fully integrated into the published WDPA once it has been approved by the data provider and formal permission has been obtained through a data contributor agreement.

Values reported here are based on an analysis completed by the UNEP–WCMC to support the [Protected Planet Report 2014](#).

### **National totals**

Methodology is provided by the WDPA; only the sections relevant to this indicator are included here. The area protected includes all areas recorded in the WDPA whose location and extent were known, with the exception of Man and the Biosphere Reserves, areas in the high seas, disputed territory, and areas in the Great Lakes, Caspian Sea and Aral Sea.

A spatial analysis was used to estimate total territorial area protected. If the boundaries of a protected area were not known, but its location and extent were known, it was modelled as a buffer around its point location. A global protected area layer was created by combining the boundaries (polygons) of the protected areas recorded in the WDPA. To estimate the area protected in 1990, a layer was created by combining only those polygons with an establishment date of 1990 or earlier (including any with an unknown establishment date). This was repeated for subsequent years.

The protected area layers were intersected with country boundaries, including coastlines and marine boundaries to obtain the absolute coverage (in square kilometers) of protected areas by country, divided into marine and terrestrial. The total terrestrial protected area of a country or territory was divided by the total area of its land (including inland waters) to obtain the relative coverage (percentage) of protected area. The total marine protected area of a country was calculated in two parts, one for territorial seas (coast to 12 nautical miles [nm]) and one for exclusive economic zones (EEZ) (12 to 200 nm). The total protected area within territorial seas and EEZ was then divided by the total national area of the territorial seas and EEZ respectively. These two results were then summed to calculate the total relative marine protected area under national jurisdiction.

### **Global totals**

Global terrestrial and marine totals were obtained from the protected areas layers for each year. The global terrestrial total was divided by the global terrestrial area (total national area plus the area of Antarctica, disputed territories, Great Lakes, Caspian Sea and Aral Sea) to obtain the relative coverage (percentage) of protected area. Similarly, the global marine total was divided by the marine area, including territorial seas, EEZ, and areas beyond national jurisdiction (beyond 200 nm) often referred to as "high seas". Increases in area protected were calculated by dividing the difference in area (later year minus earlier year) by the total area protected in the earlier year.

## 5. Caveats and limitations

- The extent to which the lands and waters of a country are protected is a useful indicator of conservation effort. However, it is not an indication of how well managed the terrestrial protected areas are, nor does it mean that protection measures are effectively enforced.
- There are known data and knowledge gaps for some countries/regions.
- The indicator does not include conservation measures other than "protection" under the internationally recognized definition. There are many other types of conserved areas and stewardship activities that are important for conserving biodiversity.
- Data availability – both in terms of quantity and quality – is improving, but not evenly across the globe. Data on protected area coverage are available for over 193 countries and territories.

### **Sources of discrepancies between global and Canada's national figures**

- United Nations Environment Programme World Conservation Monitoring Centre (UNEP–WCMC) aggregates the global and regional figures for this indicator from the national figures calculated through geographical analysis. The global, regional and national figures provided by UNEP–WCMC are therefore consistent. The global and national analyses use different geographic base layers, as appropriate to the scale of the analyses. These may cause differences in the estimated area of protected areas as well as in the baseline areas for terrestrial and marine territory.
- Differences in methodology are being reduced but continue to produce differences in results.
- For Canada, marine and terrestrial areas are labelled by the reporting jurisdiction and this information is used in the analysis. For the World Database on Protected Areas (WDPA) analysis, polygons are divided into marine and terrestrial categories using mapped coastlines. Because most Canadian marine protected area is coastal, this may have led to discrepancies between the estimates.
- Data underlying the global and national indicators are ultimately derived from the same sources, but in general will have different date stamps.
- The WDPA analysis excludes the Great Lakes.

## 6. References and further reading

### 6.1 References

[Protected Planet Report 2014: Tracking progress towards global targets for protected areas.](#)

Dudley N (ed.) (2013) [Guidelines for Applying Protected Area Management Categories](#). IUCN: Gland, Switzerland. Retrieved on 10 December, 2014.

### 6.2 Further reading

[World Database on Protected Areas, hosted on Protectedplanet.net](#)

[Protect Planet Ocean](#)

**[www.ec.gc.ca](http://www.ec.gc.ca)**

Additional information can be obtained at:

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