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Data Sources and Methods for the Sustainability of Timber Harvest Indicator

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1 Introduction

The Sustainability of Timber Harvest 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 Sustainability of Timber Harvest indicator

2.1 Description

This indicator compares the volume of timber actually harvested with the estimated national wood supply. Wood supply is the estimated volume of timber that can be harvested from an area over a specified period of time while meeting environmental, economic and social objectives. Under sustainable forest management, forest managers plan for harvest levels that will not impact the long-term sustainability of the forest resource.

The estimation of wood supply involves a complex array of factors. Wood supply levels are estimated for forests that are actively managed for timber, which is a subset of forests and other wooded land. In the State of Canada's Forests[1] a forest is defined as "an area of land where tree canopies cover more than 10% of the total area and the trees, when mature, can grow to a height of more than 5 metres. It does not include land that is predominantly urban or used for agricultural purposes." Other wooded land is defined as an "area of land where 1) tree canopies cover 5–10 percent of the total area and the trees, when mature, can grow to a height above 5 metres; or 2) shrubs, bushes and trees together cover more than 10 percent of the area. These areas include treed wetlands (swamps) and land with slow-growing and scattered trees. They do not include land that is predominantly agricultural or urban."

2.2 Rationale

Sustainable forest management, means ensuring that forests provide a broad range of goods and services over the long term. As such, forest managers plan for harvest levels that will not affect the long-term sustainability of the forest resource, while taking into account a wide range of ecological, social and economic factors. The Sustainability of Timber Harvest indicator is one measure of Canada's forest stewardship.

Canada is committed to sustainable forest management, which is defined as a "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."[2]

Sustainable forest management is a continuous process in which forest management practices and policies evolve in response to scientific advances and public participation. Underpinning sustainable forest management is the objective of meeting society's need for forest products, while at the same time protecting forest health and the environmental and social values

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[1] Natural Resources Canada (2011) The State of Canada's Forests Annual Report 2011. Retrieved on 6 July, 2012. Available from: http://cfs.nrcan.gc.ca/publications?id=32683.
2 Natural Resources Canada (2012) Glossary. Retrieved on 6 July, 2012. Available from: http://cfs.nrcan.gc.ca/terms/browse/S.

derived from Canada's forests.[3] Canada's adaptive approach to forest management is based on science, publicly transparent policies and modern technology.[4]

2.3 Changes since last report

The indicator was first reported by the CESI program in August 2011 with data current to 2009 and is being updated to bring the data current to 2010.

Some minor adjustments to previous years' data have also been done to reflect revisions in the source data. Data from 2007, 2008 and 2009 have been slightly revised, following estimates updates by provinces and territories, by less than 2%.

3 Data

3.1 Data source

Data for this indicator come from the National Forestry Database (NFD) which is maintained by the Canadian Forest Service of Natural Resources Canada (http://nfdp.ccfm.org/index_e.php). The data contained in the NFD are provided by provincial or territorial resource management organizations[5] and federal government departments.

The total area of Canada is from Natural Resources Canada's Atlas of Canada (http://atlas.nrcan.gc.ca/site/english/learningresources/facts/surfareas.html).[6]

3.2 Spatial coverage

The indicator has national coverage because it includes data provided by all provinces and territories, except from Nunavut.

3.3 Temporal coverage

The indicator presents data from 1990 to 2010. Estimates of wood supply prior to 1990 did not usually take into account data for private lands and federal lands.[7]

3.4 Data completeness

Data are updated in the National Forestry Database on a bi-annual basis.

British Columbia and the Northwest Territories did not provide figures for 2010; therefore, estimates were used in order to calculate the Canadian total.

3.5 Data timeliness

The National Forestry Database is updated bi-annually with a 14-months time lag. For instance, 2010 data were collected in 2011 and published in February 2012. If there are updates or corrections to the data, they are republished in June after the first release. This indicator is current to the end of 2010.

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[3] Natural Resources Canada (2012) Forests in Canada. Retrieved on 6 July, 2012. Available from: http://cfs.nrcan.gc.ca/pages/64.
[4] Canadian Council of Forest Ministers (2012) Sustainable Forest Management in Canada, Overview of Canada's Forests – Booklet. Retrieved on 6 July, 2012. Available from: http://www.sfmcanada.org/english/sfm.asp?tID=8.
[5] Canadian Council of Forest Ministers (2012) National Forestry Database, Partners. Retrieved on 6 July, 2012. Available from: http://nfdp.ccfm.org/nfd_partners_e.php.
[6] Natural Resources Canada (2001) The Atlas of Canada: Land and Freshwater Areas. Retrieved on 6 July, 2012. Available from: http://atlas.nrcan.gc.ca/site/english/learningresources/facts/surfareas.html/.
[7] Canadian Council of Forest Ministers (2012) National Forestry Database, Wood Supply – Background. Retrieved on 6 July, 2012. Available from: http://nfdp.ccfm.org/supply/background_e.php.

4 Methods

The Sustainability of Timber Harvest indicator compares **total wood supply** to **total harvest**.

Wood supply, the volume of timber that may be sustainably harvested, is estimated for each province and territory. Provincial and territorial wood supplies are summed to estimate Canada's total wood supply.

Each provincial or territorial contribution to **total wood supply**[7] is the sum of:

1. The estimated Annual Allowable Cuts (AAC, known as Allowable Annual Cut in British Columbia) for province-owned or "provincial Crown" lands

This is the volume of wood, estimated by professional foresters, that may be sustainably harvested each year from provincial Crown lands. Provincial Crown lands make up 77% of Canada's forest and other wooded land, but the proportion varies by province. (Details on land ownership by province can be found in The State of Canada's Forests Annual Report 2011.[1]) Most provinces establish AAC levels for their Crown lands based on a policy of maintaining a non–declining future wood supply while considering a complex range of factors. For example, AAC levels may be decreased in order to maintain animal habitat or increased to permit salvage of insect-damaged wood or in light of silvicultural investments to increase forest growth. The importance of individual factors to the AAC varies significantly among provinces and even among forest management areas within provinces because of regional differences in forestry policies. The extensive rationale behind an AAC determination for an individual forest management area is under provincial jurisdiction and additional information may be obtained from provincial resource management organizations.[5] The volume of wood harvested may be above or below the AAC in any one year, but needs to balance out over the regulation period. AACs are set based on an assessment of a wide range of ecological, social and economic factors and are therefore only a proxy for the sustainable level of harvest.

with

2. Estimates of wood supply on federal, territorial and private lands

Federal and private lands account for 16% and 7%, respectively, of Canada's forest and other wooded land. Wood supply estimates are based on sustainable management plans (when available) or on past harvest levels. Estimation methods may be similar to those used for the AAC but such estimates are not standardized among private woodlot owners.

The 2010 ownership (provincial Crown vs. federal, territorial and private lands) breakdown of wood supply by province is available from the National Forestry Database (NFD).[8]

Total harvest (from the NFD Table 5.1 D6)[9] volumes refer to roundwood,[10] which includes sections of tree stems, with or without bark; logs; bolts; pulpwood; posts; pilings; industrial

[8] Canadian Council of Forest Ministers (2012) National Forestry Database, Wood Supply Quick Facts. Retrieved on 6 July, 2012. Available from: http://nfdp.ccfm.org/supply/quick_facts_e.php.
[9] Canadian Council of Forest Ministers (2012) National Forestry Database, Total roundwood harvested, Table 5.1 D6. Retrieved on 6 July, 2012. Available from: nfdp.ccfm.org/data/compendium/html/comp_51e.html.
[10] Canadian Council of Forest Ministers (2011) National Forestry Database, Glossary – Forest Products. Retrieved on 6 July, 2012. Available from: http://nfdp.ccfm.org/glossary_e.php#products.

fuelwood; and household firewood. It does not include other forest products like Christmas trees.

Canada's total harvest is an aggregate of the following:

1. The reported total roundwood harvested from provincial Crown lands

Provincial laws require harvest from such lands to be reported and compared against the AAC value for individual forest management areas. Though the harvest must not exceed the AAC over multi-year regulation periods, a deviation by as much as 50% may be allowed in a given year. Regulation periods are 5 to 10 years in most cases. This provides the forestry industry with flexibility to respond to market conditions, while periodic limits ensure the long-term sustainability of supply.

and

2. The roundwood harvested from federal, territorial and private lands

Because there is generally no legislated mechanism to report harvest on these lands, these volumes are estimated by either provincial or federal forest authorities. Harvest from such lands is unregulated, meaning that harvesters are not required by law to compare their harvest to a sustainable level.

5 Caveats and limitations

- In some cases, figures are either unavailable or too small to be expressed or included in the national aggregate values. Detailed caveats on the quality or completeness of annual data from individual provinces, including explicit indications of which data are estimates, can be found by generating customized reports from the National Forestry Database (NFD).[11] Supply and harvest can be viewed by year, wood type (hardwood/softwood) and by land jurisdiction (provincial, private, federal and territorial) using this database.

- National aggregation can mask harvests above or below the Annual Allowable Cut (AAC) in individual provinces. Similarly, the provincial aggregates can mask variability among management areas. If harvest above the AAC occurs in a portion of a reporting period, it may be balanced elsewhere such that the overall AAC of the reporting period is not exceeded.

- As noted above, AACs are only a rough approximation of wood supply on Crown lands, as forest management agencies consider many policy factors beyond the physical sustainability of the forest when they set the level of allowable harvest.

- A large percentage of forest land in Atlantic Canada is privately owned. According to the State of Canada's Forests 2011,[1] forest land is 50% private in New Brunswick, while it is 68% private in Nova Scotia and 91% private in Prince Edward Island. In Newfoundland and Labrador, forest land is 99% provincially owned, but 69% of the timber rights on this land are leased on 99–year leases to pulp and paper companies,

[11] Canadian Council of Forest Ministers (2010) National Forestry Database, Create Your Own Report. Retrieved on 6 July, 2012. Available from: http://nfdp.ccfm.org/dynamic_report/dynamic_report_ui_e.php.

and so it is treated as private property. Because of the high percentage of private lands in Atlantic Canada, provincial agencies that determine AACs also must assess the potential timber supply on private lands. The assumed percent of private forest available for harvest differs by province. In New Brunswick, for example, 100% of private woodlots are considered available for timber supply, while in Nova Scotia only 60% are assumed available for harvesting. Because private woodlots are unregulated, there is uncertainty associated with this portion of the wood supply equation. As the Atlantic region only accounts for about 4% of Canada's total AAC, the uncertainty is moderate.

- Wood supply estimates for federal, territorial and private lands are often based solely on the average of actual past harvests, which are unregulated. For now, even though estimates are provided, it is difficult to be certain whether harvest is sustainable for these lands.

- CESI uses the total area of Canada (land and water) to calculate the proportion of the country covered by forest and other wooded land. Figures in *The State of Canada's Forests* and the National Forestry Database include "other land with tree cover" and exclude uninventoried areas. The proportion of Canada's land area covered by forest, other wooded land and other land with tree cover is over 43%.

- British Columbia and the Northwest Territories did not provide figures for 2010; therefore, estimates were used in order to calculate the Canadian total.

6 References and further reading

6.1 References

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