
Data Sources and Notes

Data tables are available from the HTML version of each indicator:
<http://www.for.gov.bc.ca/hfp/sof/2006/contents.htm#indicators>

FIGURE 6. Population of British Columbia, 1800–2003

Sources

Duff, Wilson. 1997. *The Indian history of British Columbia: the impact of the white man*. Victoria, BC: British Columbia Provincial Museum.

BC Stats. Census data from Statistics Canada prepared by BC Stats.
<http://www.bcstats.gov.bc.ca/data/pop/pop/BC1867on.csv>

Indicator 1 – Ecosystem diversity

Sources

Bailey, R.G. 1998. *Ecoregions: the ecosystem geography of the oceans and continents*. Springer-Verlag, New York, N.Y.

B.C. Ministry of Agriculture and Lands, Integrated Land Management Bureau. Baseline thematic mapping.
<http://ilmbwww.gov.bc.ca/bmgs/> (Indicator 1-1)

B.C. Ministry of Forests and Range, Research Branch. Biogeoclimatic ecosystem classification.
<http://www.for.gov.bc.ca/hre/becweb/resources/classificationreports/provincial/index.html>
(Indicators 1-1, 1-4)

B.C. Ministry of Forests and Range, Forest Practices Branch. Seamless forest cover inventory (2000) of British Columbia (available only in the ministry). (Indicators 1-2, 1-3, 1-4)

Department of Lands and Forests. 1957. *Continuous forest inventory of British Columbia*. Victoria, B.C. (Indicator 1-3)

Notes

1. Of the 30 global terrestrial ecoregions (Bailey, 1998), 6 are found in B.C.: Subarctic Division, Subarctic Regime Mountains, Warm Continental Regime Mountains, Marine Division, Marine Regime Mountains, Temperate Steppe Regime Mountains.

Indicator 1-1:

2. Land cover is based on baseline thematic mapping (version 1), derived from LANDSAT TM imagery, 1:70,000 aerial photographs, Ministry of Forests and Range Mapgen age class information, biogeoclimatic data, and structured digital 1:250,000 topography.
3. Biogeoclimatic zones are based on the British Columbia biogeoclimatic ecosystem classification (version 4). Since this analysis, version 4 has been superseded.
4. The Alpine Tundra (AT) and Bunchgrass (BG) zones are treeless, by definition. Vegetated areas are dominated by shrubs, herbs, bryophytes and lichens in the AT zone; and by grasses and shrubs in the BG zone. Nonetheless, forest cover inventories show

some forest in the areas mapped as AT and BG. This is the result of the combination of methods and definitions used in interpretation of satellite imagery, and of the inaccuracies in the mapping of biogeoclimatic zones. Biogeoclimatic zone maps were improved in version 5, published after this analysis.

Indicator 1-2:

5. Forest cover is from the seamless forest cover inventory (2000) for the whole province, which combined four spatial databases to provide the best data available in government in early 2001:
 - a) TSA inventory: The current government inventory, used primarily for managing timber supply areas (TSAs), was used for about 90% of the province.
 - b) TFL inventory: Parts of 1990s forest company inventories, used for managing tree farm licences (TFLs), were used for about 6% of the province.
 - c) Park inventory: The 1957 provincial forest cover inventory, the only forest cover inventory available for part or all of 11 of British Columbia's parks, was used for about 2% of the province
 - d) Proxy inventory: Baseline thematic mapping (BTM), based on LANDSAT satellite imagery from the 1990s, and biogeoclimatic ecosystem classification (BEC) at the subzone/variant level were combined to approximate forest cover for the remaining 2% of the province, primarily private land and a few protected areas.

The first three inventories are interpreted from air photos, calibrated with ground samples and mapped at 1:20,000 scale (about 7,000 map sheets are required to cover B.C. at this scale). Tree growth was projected to January 2000 for the TSA inventory and to January 1999 for the TFL and Park inventories. Species composition of forests changes over time, but this ecological succession is not modelled in the projection. Updating for major disturbances (e.g., fire, logging) is typically done within a few years in the TSA and TFL inventories. The Park inventory was updated to the early 1990s. The Proxy inventory's land/forest cover and forest age are from BTM, and predominant species are based on species found in the TSA and TFL inventories for like combinations of forest age and ecosystem (BEC subzone/variant).
6. Proxy inventory areas 140+ years are assumed to be 250+ years. Most of these areas are coastal hemlock and western redcedar, for which adjacent areas with regular forest inventories show 250+ years.

Indicator 1-3:

7. Provincial coverage from the 1957 inventory is available only as a book with summary tables. For this analysis, tables were combined and in part pro-rated to derive the age class distributions.
8. The age class distributions for 2000 were summarized from the seamless forest cover inventory described in Notes 5 and 6.
9. The Coast/Interior boundary for 1957 is not the same as the one for 2000. Total Coast area was reported as 16.4 million hectares in 1957 and 17.6 million hectares in 2000. The forest area in the Coast is 2.8 million hectares greater in 2000 than in 1957. Only part of this change is explained by the change in land base. Much of the change is likely due to changes in inventory methods (classification).
10. "N/A" stands for age not available.

11. Terms used in the two inventories were aligned as follows:

N/A:

1957	not bearing commercial forest + selectively cut
2000	not-stocked productive (NSR, NC, NCBr) + non-productive

NSR = not sufficiently restocked
NC = non-commercial
NCBr = non-commercial brush

Age known:

1957	bearing commercial forest (productive and low site)
2000	stocked productive + all forest in Proxy inventory

Indicator 1-4:

12. See Notes 3, 4, 5 and 6 for Indicator 1.

Indicator 2 – Protected forests

Sources

B.C. Ministry of Forests and Range, Forest Practices Branch. Seamless forest cover inventory (2000) of British Columbia (available only in the ministry). (Indicators 2-1 to 2-4)

B.C. Ministry of Environment, BC Parks.

<http://www.env.gov.bc.ca/bcparks/> (Indicators 2-1 to 2-4)

B.C. Ministry of Agriculture and Lands, Integrated Land Management Bureau.

<http://ilmbwww.gov.bc.ca/> (Indicators 2-1 to 2-4)

B.C. Ministry of Forests and Range, Research Branch. Biogeoclimatic ecosystem classification.

<http://www.for.gov.bc.ca/hre/becweb/resources/classificationreports/provincial/index.html>
(Indicators 2-1, 2-4)

B.C. Ministry of Environment, Ecosystems Branch. Ecoregions of British Columbia.

<http://www.env.gov.bc.ca/ecology/ecoregions/index.html> (Indicator 2-3)

Notes

Indicator 2-1:

1. For biogeoclimatic zones and forest cover, see Notes 3, 4 and 5 for Indicator 1.
2. Protected areas are as of December 2002. Only minor changes occurred between then and 2005. Also included are proposed protection areas identified in the preliminary land use plan for the Central Coast. These areas have been off-limits to logging to conserve environmental and cultural values. Final land-use decisions with some adjustments were made in early 2006.

Indicator 2-2:

3. For forest cover, see Notes 5 and 6 for Indicator 1.
4. For protected areas, see Note 2 for Indicator 2.

Indicator 2-3:

5. For forest cover, see Note 5 for Indicator 1.
6. For protected areas, see Note 2 for Indicator 2.

7. The number of ecosections in B.C. has expanded over the years as a result of advances in scientific understanding and mapping. This analysis and the related maps are based on the classification of ecosystems available in 2003, which includes 132 ecosections that are either terrestrial or a mix of terrestrial and saltwater areas.
8. A small area did not have an ecosection assigned to it, because of a lack of overlap between the inventory and ecosection coverages resulting from minor mapping discrepancies.

Indicator 2-4:

9. For biogeoclimatic zones and forest cover, see Notes 3, 4, 5 and 6 for Indicator 1.
10. For protected areas, see Note 2 for Indicator 2.

Indicator 3 – Ecosystem dynamics

Sources

B.C. Ministry of Forests and Range, Forest Analysis and Inventory Branch. Forest Inventory. (Indicators 3-1 to 3-3)

Natural Resources Canada, Canadian Forest Service. Carbon Budget Model of the Canadian Forest Sector (CBM-CFS2).

http://carbon.cfs.nrcan.gc.ca/cbm/index_e.html (Indicators 3-1 to 3-3)

Data for modelling (1951–2000) and forecasting (2001–2050) (Indicators 3-1 to 3-3)

Area Harvested

1951–1973: Volume harvested by region from B.C. Ministry of Forests annual reports was converted to area harvested by region using average volume/ha harvested from 1974–1989. There was no information about the Cariboo Forest Region up to 1973, so a proportion of volume was removed from adjacent regions and allocated to the Cariboo.

1974–1999: by forest region from B.C. Ministry of Forests annual reports

2000–2004: by TSA & TFL from Carbon Accounting Team, Pacific Forestry Centre, Canadian Forest Service

2005–2050: by TSA & TFL from B.C. Ministry of Forests and Range projections

Area Burned

1951–1958: Total area burned in B.C. (Doug Higgins, former Petawawa National Forestry Institute, 1992) was allocated across broad ecoregions by using average distribution from 1959–1968.

1959–1979: Large Fires Database (Steve Taylor, Pacific Forestry Centre, Canadian Forest Service), by region and BEC zone

1980–2004: Fires by TSA and TFL

2005–2050: Average area burned, 1990–1999

Area of Insect Infestations (mountain pine beetle, Douglas-fir beetle and spruce beetle)

1951–1999: PestHistory.mdb database, from B.C. Ministry of Forests and Range website, maintained by Tim Ebata

2000–2004: Carbon Accounting Team, Pacific Forestry Centre, Canadian Forest Service

2005–2050: Douglas-fir beetle and spruce beetle: average of 1995–2004

2005–2050: Mountain pine beetle: potential scenario, one of numerous projections by the Carbon Accounting Team, Pacific Forestry Centre, Canadian Forest Service

Data for provincial total with actual MPB (1981–2005) (Indicator 3-1)

Actual areas for mountain pine beetle are from Tim Ebata, MFR. Other areas (harvest, fire, Douglas-fir beetle and spruce beetle) are the same as those used for modelling and forecasting.

B.C. Ministry of Agriculture and Lands, Integrated Land Management Bureau, Base Mapping and Geomatic Services. Road locations from TRIM 1 and TRIM 2.

<http://ilmbwww.gov.bc.ca/bmgs/products/mapdata/index.htm> (Indicator 3-4)

B.C. Ministry of Agriculture and Lands, Integrated Land Management Bureau, Corporate Data Management Services. Watershed Statistics.

<http://ilmbwww.gov.bc.ca/dm/> (Indicator 3-4)

B.C. Ministry of Forests and Range. Annual Reports.

<http://www.for.gov.bc.ca/mof/annualreports.htm> (Indicator 3-4)

Notes

Indicator 3-1:

1. The graph shows both a modelled analysis (stacked bars) and a provincial total with actual MPB (line). The area of MPB disturbance shown includes all severity types combined. Douglas-fir beetle and spruce beetle were modelled but not shown in the stacked bars because their level of impact is small; they are included in the provincial total with actual MPB line.
2. Modelling
 - a) Areas included in the modelled analysis were: all TSA, all TFL, and four national parks: Glacier, Yoho, Kootenay, Mt. Revelstoke. No other parks or private lands were included.
 - b) Harvesting and fire levels are under-predicted in the first 50 years. This occurred for three reasons: methods by which the back-casting was done, over-prediction of the volume/ha harvested (which lead to an under-prediction of the area harvested), and some modelling constraints.
 - c) Harvesting levels were given by area in BEC zone and region prior to 2000, and by volume in TSA after 2000. The model then used age data and growth curves to determine where the harvesting occurred. Some inaccuracies prior to 2000 occurred because of the back-casting program. Harvest area includes the area of salvage logging
 - d) Modelled forecasts of future area disturbed by fire, Douglas-fir beetle and spruce beetle assumed constant rates. Actual rates of disturbance will be different. Other insects are active in the forests but were not modelled because their impact is not yet defined to model standards, and most do not cause tree mortality.
 - e) The sample forecast presented is one of many possible scenarios for mountain pine beetle. Mountain pine beetle was forecast in detail for 2001 onward, based on potential dynamics of the epidemic, as known at the time of analysis, when data for the actual extent of the infestation in 2005 were not available.
 - f) Fire, harvest and salvage logging were all assumed to be stand-replacing, i.e., the age of the forest is reset to zero. All insect disturbances were assumed to be partial disturbances that do not reset age to zero. This assumption is correct for most insect disturbances, but does not accurately model severe infestations of mountain pine beetle in pure stands of lodgepole pine. Insect disturbances were classified as either low, medium, or severe (according to the data), and each severity was modelled to have a different impact on the forest.
3. Provincial total with actual MPB
For 1981–2005 (the periods ending 1985 to 2005), this shows the sum of modelled areas for harvest, fire, Douglas-fir beetle and spruce beetle, plus the provincial actual area of MPB infestation.

Indicator 3-2:

4. For a description of modelling, see Note 2 for Indicator 3.
5. The area of the timber-harvesting landbase (THLB) and the area outside the THLB (non-THLB) were assumed to be the same as in 2000 for all years of modelling.
6. When inventory levels were back-cast to 1951, it was assumed that all forests were between 80 and 150 years old before disturbance. This assumption does not affect the modelled areas that are more and less than 80 years old.
7. The area disturbed by harvest and fire in the first 50 years was underestimated by the model. The area moving from over 80 years old to under 80 years old is therefore underestimated, as are the areas over 80 years old shown for the first 50 years.

Indicator 3-3:

8. For a description of modelling, see Notes 2 and 5 for Indicator 3.
9. Ecosystem carbon includes total live biomass and dead organic matter. Biomass carbon includes all living biomass, both above ground and below ground. It includes the stem, branches, foliage, roots, etc. Merchantable biomass carbon includes the biomass that is merchantable and would be removed from the forest during timber harvest.
10. The increase in biomass levels from 1951 to 2000 is likely overestimated due to the model underestimating the age of the forests in 1951, and to the underestimate of the area disturbed by fire and harvesting. If forests in 1951 are, on average, older, they contain more biomass, will be accumulating less biomass over time, and any disturbances in these forests will cause a larger decrease in biomass.
11. The model does not adequately represent changes in growth curves before or after a disturbance event. Forests disturbed prior to 2000 are assumed to be growing on a second-growth yield curve before the disturbance, even if they represent old growth forests. Changes in species and regeneration delays after disturbances are not captured by the model.

Indicator 3-4:

12. For the detailed analysis of watersheds and resulting display maps, a geographic information system was used to analyze roads from TRIM 1 (1980s) and TRIM 2 (1990s) to determine road density for each of about 18,000 watershed units.
13. To estimate road density for 1970–2022, it was noted that TRIM 2 (circa 1999) indicates a 45% increase in roads since TRIM 1 (circa 1988) in the part of B.C. that was resurveyed. During that same time period there was a 45% increase in forest service roads based on Ministry of Forests annual reports, suggesting that it would be reasonable to use this rate of change for the whole province. Extending that rate of increase to 2005 led to a 70% increase from 1988 to 2005.
The road density classes from the detailed analysis were subdivided into smaller density classes (e.g., 0 to 0.1 km/km² was subdivided into ten classes of 0.01 each; 0.1 to 0.6 was subdivided into 6 classes of 0.1 each, etc.). The area in each broad class was then distributed evenly among these smaller density classes, so that the rate of change could be applied to the finer gradient of the smaller density classes. Backcasting and forecasting of road density with the 70% rate of change for 17 years (based on 1988 to 2005) was done for each of the smaller density classes (e.g., the area in the density class 1.0 to 1.1 km/km² in 1988 was backcast to have a density of 0.6 in 1970, and forecast at 1.7 in 2005 and 2.9 in 2022). The areas related to each of the smaller density classes were then regrouped into the broad density classes.

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14. A separate analysis based on a review of unroaded watersheds in 1990, and consideration of which watersheds were likely to stay undeveloped due to protection status or remoteness, concluded that 18% of the province would likely stay essentially undeveloped over the long term, well beyond 2020.

Indicator 4 – Species Diversity

Sources

B.C. Ministry of Forests and Range. 2006. Species database. (Species information, including populations and population trends, was assembled from many sources. For a complete listing of sources, see the species database, available from Indicator 4-1 of *The State of British Columbia's Forests – 2006*).

<http://www.for.gov.bc.ca/hfp/sof/> (Indicators 4-1 to 4-3)

Canadian Council of Forest Ministers. 2005. Criteria and Indicators of Sustainable Forest Management in Canada – National Status 2005. Indicator 1.2.1 – Status of forest-associated species at risk.

http://www.ccfm.org/ci/rprt2005/English/pg31-47_1-2-1.htm (Indicators 4-1 to 4-3)

B.C. Ministry of Sustainable Resource Management. 2002. Species ranking in British Columbia.

<http://wlapwww.gov.bc.ca/wld/documents/ranking.pdf> (Indicator 4-2)

B.C. Ministry of Environment, Conservation Data Centre. February 2006. Species Risk Ranking List Changes. (Indicator 4-2)

B.C. Ministry of Environment, Conservation Data Centre. 2006. BC Species and Ecosystems Explorer.

<http://www.env.gov.bc.ca/atrisk/toolintro.html> (Indicator 4-2, 4-3)

B.C. Ministry of Environment. Identified Wildlife Management Strategy.

<http://www.env.gov.bc.ca/wld/frpa/iwms/index.html> (Indicator 4-3)

B.C. Ministry of Forests. 2006. Species diversity and composition for British Columbia. Unpublished report. 75 pp. (Indicator 4-4)

Notes

Indicator 4-1:

1. This analysis is based on the CCFM definition of forest-associated species, which uses four categories of forest association, plus non-forest associated and unknown. There are two special cases:
 - a) Vascular Plants: The forest association rating for vascular plants reflects the plant's shade tolerance. Those plants not shade tolerant are deemed non-forest associated. Those that grow in the open and often in the forest are '3' (forest using but not forest dependent) and those found only in forest are '1' (forest dependent and forest dwelling). Those rated '2' normally 'dwell' in the (deeper) forest, but occasionally are found in openings where there is more light. Old growth forests are generally poorer in vascular plants than their successional stages.
 - b) Freshwater Fish: The forest association rating for freshwater fish is defined as having a high, medium or low (H, M or L) dependence on forests (E for extinct is used where the degree of association was not known). This methodology was developed by the BC State of Environment Reporting Office for Environmental Trends 2000. A complete methodology is available in the Environmental Trends 2000 Technical Document: Forest Species in BC.

Indicator 4-2:

2. See Note 1 for Indicator 4.
3. The CDC lists species risk ranks in B.C. as:
RED = extirpated, endangered or threatened (red-listed species and sub-species have, or are candidates for, official Extirpated, Endangered or Threatened Status in B.C.),
BLUE = special concern,
YELLOW = not at risk.

Indicator 4-3:

4. About 100 forest-associated species were selected for a secondary table (included with the species database), using the following rationale:
 - a) All species selected by the CCFM for the National Status 2005 report that occur in B.C. were included.
 - b) For species not selected by the CCFM:
 - For red-listed (extirpated, endangered or threatened) or blue-listed (special concern) species, include:
 - All species designated as Identified Wildlife (IW) under the *British Columbia Forest and Range Practices Act*, and/or
 - All species for which timber management is a known major threat.
 - For yellow-listed (not at risk) species, include a small selection of species that:
 - Are forest-associated (Category 1 or 2, i.e., with a known level of dependence on forest); and
 - Are well-known as having ecological, economic or social/cultural significance.
5. From the secondary table, 14 species (and 3 subspecies) were selected for the indicator map to represent:
 - a) At least one species from each taxonomic group;
 - b) Species for which population and trend data are available (or inferred from habitat conditions for amphibians and reptiles);
 - c) All population trends: Increasing (I), Decreasing (D), Stable (S); Variable (V), Unknown (U);
 - d) Species dependent on a mix of forest types and ages;
 - e) Some of the species that are significant for a variety of ecological, economic or cultural/social reasons; and
 - f) Species from various parts of B.C., resulting in a broad geographical distribution on the map.

Indicator 4-4:

6. Data were available for 1,552,207 ha of reforested land harvested in the years 1970 to 1987, inclusive. This represents about 57% of the 2,728,164 ha clearcut in the years 1970 to 1987/88, inclusive. The new reforestation policy came into effect for most public land in October 1987.
7. Data were available for 307,995 ha of reforested land harvested in 1988 and later years, primarily before 1998/99 with small areas from subsequent years. This represents about 11% of the 2,690,365 ha clearcut in 1988/89 through 2004/05.

Indicator 6 – Genetic Diversity**Sources**

University of British Columbia Centre for Forest Gene Conservation. 2005. Range maps and conservation status of BC tree species.

<http://genetics.forestry.ubc.ca/cfgc/range-maps.html> (Indicator 6-1)

Hamann, A., S.N. Aitken and A.D. Yanchuk. 2004. Cataloguing *in situ* protection of genetic resources for major commercial forest trees in British Columbia. *Forest Ecology and Management* 197 (1-3): 295-305.
http://genetics.forestry.ubc.ca/cfgc/proj_cataloguing/files_for_download/DYGENextended.pdf
(Indicator 6-1)

Hamann, A., P. Smets, S.N. Aitken and A.D. Yanchuk. 2005. An ecogeographic framework for *in situ* conservation of forest trees in British Columbia. *Can. J. For. Res.* 35:2553-2561.
(Indicator 6-1)

Stoehr, M.U. and El-Kassaby, Y.A. 1997. Levels of genetic diversity at different stages of the domestication cycle of interior spruce in British Columbia. *Theoret. And Applied Genetics* 94:83-90. (Indicator 6-2)

B.C. Ministry of Forests and Range. Annual reports.
<http://www.for.gov.bc.ca/mof/annualreports.htm> (Indicator 6-3)

B.C. Ministry of Forests and Lands. 2006. Reporting Silviculture Updates and Land status Tracking System (RESULTS) database. (Indicator 6-3, 6-4)

Notes

Indicator 6-1:

1. Species ranges (distribution and frequency) were modelled by combining data from 34,000 ecological sample plots established throughout the province with the biogeoclimatic ecosystem classification (BEC) of the land base into 14 zones, 97 subzones and 152 variants (BEC version 4). The results presented here were subsequently confirmed by a similar, still unpublished analysis of the seamless forest cover inventory that was developed for several indicators in *The State of British Columbia's Forests – 2004* and *2006*. See Indicator 1-2 for details about the inventory.
2. The protected areas used in this analysis are as of 2001. The proposed protection areas identified in the preliminary land use plan for the Central Coast were not included. Levels of conservation of genetic resources were deemed adequate for the coastal areas, without including the proposed protection areas. Final land-use decisions with some adjustments were made in early 2006, further increasing the level of genetic resource conservation.
3. Species range maps for 49 tree species found in B.C. are available at <http://genetics.forestry.ubc.ca/cfgc/range-maps.html>.

Indicator 6-2:

(None)

Indicator 6-3:

4. Area harvested on public (Crown) land is provided for comparison. Partial cutting includes seed tree, selection, shelterwood and coppice harvesting methods. Data are from ministry annual reports for 1971 onwards; area for 1970 was estimated from volume harvested.
5. Area planted on public (Crown) land is provided for comparison. It includes planting, replanting, fill planting and areas where restocking subsequently failed. Data are from ministry annual reports for 1973 onwards; areas for 1970–1972 were estimated.
6. Area of public (Crown) land that was successfully reforested by natural regeneration and planting is from ministry annual reports for 1989/90 onwards, based on surveyed and

reported changes to Not Sufficiently Stocked (NSR) areas of public (Crown) land. For earlier years, estimates of area reforested are based on area harvested and planted, and estimated rates of natural regeneration, losses to insects, diseases and restocking failures. The annual area successfully reforested by natural regeneration and planting is also shown as "Reforestation" in Indicator 14-2.

7. Genetic source of tree seed was determined as follows: Successful reforestation by natural regeneration necessarily uses wild seed (no selection for desired genetic traits). Successful reforestation by planting uses both wild seed and select seed. The area successfully reforested (planted) with select seed was extracted from RESULTS for 1988 to 2002/03. Data for subsequent years were incomplete at the time of analysis. The remaining area successfully reforested by planting used wild seed.

Indicator 6-4:

8. The data for Indicator 6-4 were extracted from RESULTS a few years after data for Indicator 6-3 were extracted. Differences between the two sets of data are probably the result of additional data entry that occurred between the two data extractions. The biggest change was in the area reforested by planting, which was reported as 116,779 ha in the annual report (used for Indicator 6-3) and is 149,077 ha in this analysis.

Indicator 11 – Ownership and Management

Sources

B.C. Ministry of Agriculture and Lands, Integrated Land Management Bureau. Provincial forest files (for records of all deletions and additions to provincial forests). (Indicator 11-1)

B.C. Ministry of Forests and Range. 1998. Provincial summary reporting system: Management by ownership and classification report (for federal ownership data for Dominion Government Blocks and Military Reserve Lands). (Indicator 11-1)

B.C. Ministry of Forests and Range. Log Exports Administration (log export data).
<http://www.for.gov.bc.ca/HET/Export/index.htm> (Indicator 11-1)

Statistics Canada's Canadian International Merchandise Trade Database (log export statistics).
http://www.statcan.ca/trade/scripts/trade_search.cgi (Indicator 11-1)

B.C. Ministry of Forests and Range, Forest Practices Branch. Seamless forest cover inventory (2000) of British Columbia (available only in the ministry). (Indicator 11-2)

B.C. Ministry of Agriculture and Lands, Integrated Land Management Bureau.
<http://ilmbwww.gov.bc.ca/> (Indicator 11-2)

B.C. Ministry of Forests and Range, Resource Tenures and Engineering Branch.
<http://www.for.gov.bc.ca/hth/> (Indicator 11-2)

B.C. Ministry of Environment, BC Parks.
<http://www.env.gov.bc.ca/bcparks/> (Indicator 11-2)

B.C. Ministry of Environment. 2002. Environmental trends in British Columbia in 2002.
<http://www.env.gov.bc.ca/soerpt/> (Indicator 11-2)

Indian and Northern Affairs Canada.
<http://www.ainc-inac.gc.ca/index-eng.asp> (Indicator 11-2)

BC Assessment.

<http://www.bcassessment.bc.ca/> (Indicator 11-2)

Pearse, Peter H. 1976. Timber rights and forest policy in British Columbia. Report of The Royal Commission on Forest Resources. Victoria, B.C.

<http://www.for.gov.bc.ca/hfd/pubs/Docs/Mr/Rc/Rc006/Rc006.pdf> (Indicator 11-3)

Forest Resources Commission. 1991. The future of our forests. Victoria, B.C.

<http://www.for.gov.bc.ca/hfd/pubs/Docs/Mr/Rc/Rc001/Rc001.pdf> (Indicator 11-3)

Nawitka Resource Consultants. 1991 (revised). Data on the Corporate Concentration of Harvesting Rights, Manufacturing Capacity and Ownership in the B.C. Forest Industry. *In* Background Papers – Volume 5, prepared for the Forest Resources Commission. Victoria, B.C.

<http://www.for.gov.bc.ca/hfd/pubs/Docs/Mr/Rc/Rc001e/V5BPfull.pdf> (Indicator 11-3)

B.C. Ministry of Forests and Range, Resource Tenures and Engineering Branch.

Apportionment tables for 1995/96–2005/06, data for major licensees, 1993/94–2005/06.

<http://www.for.gov.bc.ca/hth/apportionment/apportionment.htm> (Indicator 11-3, 11-4)

B.C. Ministry of Forests and Range, Forest Analysis and Inventory Branch. AAC database (available only in the ministry). For related information, see:

<http://www.for.gov.bc.ca/hts/tsr.htm> (Indicator 11-4)

B.C. Ministry of Forests and Range. Regional summaries of proposed allowable annual cut takeback and reallocation volumes (available only in the ministry). (Indicator 11-4)

B.C. Ministry of Forests and Range, BC Timber Sales. Sales volumes database, 2002/03–2005/06 (available only in the ministry). (Indicator 11-4)

B.C. Ministry of Forests and Range. Annual Reports.

<http://www.for.gov.bc.ca/mof/annualreports.htm> (Indicator 11-4)

Notes

Indicator 11-1:

1. Provincial Forest Files include documentation for each parcel of land deleted from provincial forests constituting a change in ownership. Some deletions from provincial forests, such as new provincial parks, do not involve a change in ownership and are not shown.
2. For assistance with obtaining statistical log export data from Statistics Canada refer to: <http://www.statcan.ca/cgi-bin/statcomment.pl>
3. Residential in Changes table: from 1980/81–1990/91 Residential was categorized as "Settlement".
4. Commercial in Changes table: from 1983/84–1993/94 deletions of land for commercial purposes were not identified as a separate category.

Indicator 11-2:

5. Provincial forest area and land area are from the seamless forest cover inventory (2000) for the whole province. See Indicator 1-2 for details.
6. Protected areas are as of December 2002. Only minor changes have occurred between then and 2005. Also included are proposed protection areas identified in the preliminary

land use plan for the Central Coast. These areas have been off-limits to logging to conserve environmental and cultural values. Final land-use decisions with some adjustments were made in early 2006.

7. First Nations forest and land (treaty settlement land) areas are based on maps and data tables from provincial and federal agencies. Federal Indian Reserve forest and land data for 2005 are from the Integrated Land Management Bureau, current to April, 2005.
8. Private forest and land areas were based on maps and data tables from provincial agencies, with breakdowns by tenure type estimated where necessary.
9. Areas for forest tenures were based on maps and data tables from MFR, with breakdowns for volume-based tenure types estimated on the basis of volume proportions.

Indicator 11-3:

10. The sum of allowable annual cuts (AACs) refers to those set by the provincial government. AACs are as of December 31 of the year listed (the starting year of fiscal years).
11. Company data for 1975 are for July 2, 1975, from the 1976 royal commission.
12. Company data for 1990/91 are for January 22, 1991, as reported by Nawitka (1991), except:
 - 1) Nawitka showed the Ministry of Forests as the largest "Group/Company," based on sales under the Small Business Forest Enterprise Program which made public timber available to hundreds of small companies; this is not considered relevant to this analysis of large operators.
 - 2) Nawitka reported Noranda as the second largest "Group/Company," based on its 49% interest in MacMillan Bloedel; this analysis shows MacMillan Bloedel on its own, to be consistent with the *Forest Act* requirement of a controlling interest (greater than 50%) for a transfer of ownership. If Noranda were shown as reported by Nawitka, Noranda would be the top company with 14.1% of AACs, and the top 10 companies would have 57.8% of AACs.
13. Company data for 1995/96–2006/07 are for the nearest available date to March 31 (end of each fiscal year), from Apportionment Report# APTR043.
14. For consistency within this report, all provincial AAC data are from Indicator 13, and include TSA, TFL, woodlot and community forest AACs. Using the AACs for TSAs and TFLs only (as in the apportionment reports) would give an upward bias to the percentage of AACs held by large operators, and this bias would increase as more of the provincial AAC is reallocated from TSAs and TFLs to woodlots and community forests. Provincial AACs for all years are for December 31 of the year listed (the starting year of fiscal years).

Indicator 11-4:

15. The sum of allowable annual cuts (AACs) refers to those set by the provincial government. AACs are as of December 31 of the year listed (the starting year of fiscal years).
16. Volume committed and apportioned is from MFR annual reports.
17. Woodlot licence data are based on allowable annual cuts. For 1993/94 onward, Woodlot licences are included in small operators (<25,000 m³).
18. "Small business licences" are under the Small Business Enterprise Program (later renamed Small Business Forest Enterprise Program). This program was introduced in

1980 to recognize the importance of and make timber available to small operators, to maintain a balance between small and large operators in the industry, and to enable new entrants into the industry. Data up to 1992/93 are from the MFR annual report "volume billed" statistics for each year. The SBFEP ended in 2001/2002. BC Timber Sales (BCTS) was established in 2002/2003, with a mandate that is not restricted to small business.

19. Beginning in 1993/94, volumes apportioned to "major licences" (mostly tree farm licences and forest licences) in MFR's Apportionment System and sale volumes under small business licences (and later under BCTS) were tracked with sufficient accuracy to enable reporting by size of licensee and licence, respectively. Some operators may have two small business licence (or BCTS licence) which, if combined, would place them in a higher size category. Note that apportionment and sale volumes (for 1993/94 onward) are determined before harvest, while volume billed (used for years up to 1992/93) is determined after harvest and may be more or less than the apportionment or sale volume.
20. Sale volume data for BCTS in 2005/06 are as of January 16, 2006, and understate volume for the fiscal year.
21. Community forest agreements were first issued in 2000/01. Data are from status reports that include short-term AAC increases for two licences in mountain pine beetle infested areas. Of the 11 CFAs issued by the end of 2005/06, 8 have long-term AACs under 25,000 m³ per year, and only 3 have long-term AACs of 25,000–100,000 m³. Five CFAs were issued in 2006/07, the largest with an AAC of 25,000 m³. All CFAs were included in small operators <25,000 m³.
22. The forest reserve provides about 1,000,000 m³/year of unallocated timber that is used for various minor, short-term licences, and is therefore included in the under 25,000 m³/year category.

Indicator 13 – Timber Harvest

Sources

B.C. Ministry of Forests and Range. Annual Reports.

<http://www.for.gov.bc.ca/mof/annualreports.htm> (Indicator 13-1, 13-2)

B.C. Ministry of Forests and Range, Forest Analysis and Inventory Branch. AAC database (available only in the ministry).

<http://www.for.gov.bc.ca/hts/tsr.htm> (Indicator 13-2)

B.C. Ministry of Forests and Range, Forest Analysis and Inventory Branch.

<http://www.for.gov.bc.ca/hts/tsr.htm> (Indicator 13-3, 13-4)

Notes

Indicator 13-1:

1. Harvest figures are by calendar year for 1945–1979 and fiscal year (April 1 to March 31) for 1980/81 onward, listed as 1980 onward.
2. All timber harvested from public and private land is included.
3. The allowable annual cuts (AACs) referred to are those set by the provincial government. AACs are as of December 31 of the year listed (the starting year of fiscal years).

Indicator 13-2:

4. See Note 1 for Indicator 13.
5. Timber harvested is from public and private land that is regulated by allowable annual cuts (AACs) set by the provincial government.
6. See Note 3 for Indicator 13.
7. In 1981, public sustained yield units (PSYUs) were replaced by timber supply areas (TSAs).

Indicator 13-3:

8. For TSAs and TFLs, data for 2000–2004 are from the report *The State of British Columbia's Forests–2004*. For 2005–2150, data are from base cases in the most recent timber supply analyses. Many of these include verified higher growth rates. Estimated effects of anticipated higher growth rates are shown separately for management units where higher growth rate have not yet been verified.
9. For woodlots and community forest agreements, actual AAC data are used for 2000–2005. The 2005 level of AAC is projected to 2006–2150.

Indicator 13-4:

10. Data for 2000 are from the report *The State of British Columbia's Forests–2004*. For 2050, data are from base cases in the most recent timber supply analyses. Many of these include verified increases in growth rates. Estimated effects of unverified increases in growth rates are not included.
11. Recent increases in the Fraser and Golden Timber Supply Areas (TSAs) are included, as are adjustments reflecting the 2003 fire season in the Kamloops TSA.
12. The 12% threshold was chosen because the sum of timber supply in 2000 for all TSAs and TFLs was 12% higher than the average harvest in TSAs and TFLs in the 1990s. This suggests that a decrease of up to 12% would not prevent, at a provincial level, the level of harvest and related economic activity achieved in the 1990s.

Indicator 14 – Silviculture**Sources**

B.C. Ministry of Forests and Range. *Annual reports*.

<http://www.for.gov.bc.ca/mof/annualreports.htm> (Indicator 14-1, 14-3, 14-4)

B.C. Ministry of Forests and Range. *Annual reports*. (area harvested, area planted, NSR change tables)

<http://www.for.gov.bc.ca/mof/annualreports.htm> (Indicator 14-2)

B.C. Ministry of Forests and Range. Seed Planning And Registry system (SPAR).

<http://www.for.gov.bc.ca/hti/spar/index.htm> (Indicator 14-3, 14-4)

B.C. Ministry of Forests, Forest Practices Branch. 2001. Revised performance measures for assessing investment benefits in the backlog and enhanced forestry program. 26 pp.

http://www.for.gov.bc.ca/hfp/silstrat/provinfo/performance_indicators_package_010214.pdf (Indicator 14-4)

Notes

Indicator 14-1:

1. Partial cutting systems cut selected trees and leave desirable trees for various objectives including tree regeneration, visual screens and wildlife habitat; traditionally it was used primarily in dry areas of the Interior as a method for ensuring regeneration. Variable retention is a relatively recent variation of partial cutting, with a focus on trees or areas to retain, to ensure a range of structure and ecological functions such as those provided by wildlife trees. Variable retention can be combined with traditional partial cutting systems such as shelterwood or selection. Clearcutting with reserves also retains trees or groups of trees to provide habitat for stand-level biological diversity.
2. The areas for 1970 are estimated using the ratio of volumes harvested in 1970 and 1971, applied to the areas harvested in 1971.

Indicator 14-2:

3. Area harvested on public (Crown) land is provided for comparison. Partial cutting includes seed tree, selection, shelterwood and coppice harvesting methods. Data are from ministry annual reports for 1971 onwards. The area for 1970 was estimated using the ratio of volumes harvested in 1970 and 1971, applied to the areas harvested in 1971.
4. Area planted on public (Crown) land is provided for comparison. It includes replanting, fill planting and areas where restocking subsequently failed. Data are from ministry annual reports for 1973 onwards; areas for 1970–1972 were estimated.
5. Disturbances or "Additions to NSR" are areas that become not satisfactorily restocked (NSR) with timber due to harvesting, fire, insects, diseases and other causes. Data for 1989/90 onwards are based on surveyed and reported changes to NSR areas of public (Crown) land, from ministry annual reports. For earlier years, estimates are based on areas harvested and planted, and estimated rates of losses to fires, insects, diseases and restocking failures.
6. Reforestation or "Reductions to NSR" are areas successfully reforested by natural regeneration or planting. Data for 1989/90 onwards are based on surveyed and reported changes to NSR areas of public (Crown) land, from ministry annual reports. For earlier years, estimates are based on areas harvested and planted, and estimated rates of natural regeneration, losses to fires, insects, diseases and restocking failures.
7. Reclassification of NSR status is based on new survey information. The large areas reclassified from NSR to non-productive (NP) forest land in the 1990s corrected earlier inclusion of marginal forest land in NSR statistics, based on overview surveys. The smaller areas reclassified in recent years reflect surveys providing more accurate data about productive land converted to permanent access roads.

Indicator 14-3:

8. Treatments shown here are generally made to improve the future quantity and value of timber, and they are generally not needed to ensure reforestation except in some circumstances (e.g., spacing very dense stands to prevent stagnation of growth).
9. Area of fertilizing, pruning and spacing treatments is from ministry annual reports.
10. The area successfully reforested (planted) with select seed was extracted from RESULTS for 1988 to 2002/03. Data for subsequent years were estimated based on seed request data in the sowing year (one year before planting) from the SPAR system, which closely track the RESULTS data for years that both are available.

Indicator 14-4:

11. Treatments shown here are generally made to improve the future quantity and value of timber, and they are generally not needed to ensure reforestation except in some circumstances (e.g., spacing very dense stands to prevent stagnation of growth). Pruning is not shown as it provides value gains, volume gains.
12. Cumulative volume gains were estimated for 65 years of growth using the following average annual rates per hectare:
 - 0.50 m³ planting one to three years after logging (relative to satisfactory natural regeneration)
 - 2.93 m³ backlog planting (relative to a NSR site, overgrown by competing vegetation)
 - 0.40 m³ fertilizing
 - 0.25 m³ spacing
 - 0.41 m³ select seed (average gain in 2004/05, adjusted for lower and higher genetic quality in earlier and later years, respectively)

The gains are from the ministry's 2001 report, except the gain for select seed was increased from the 0.38 m³ in the report to 0.41 m³ to reflect the provincial average based on growth and yield forecasts (using the TIPSYS model) for predominant commercial species: coast Fdc, interior Pli/Sx.

13. The expected volume gain (genetic worth) of select seed ranges from 3% in 1994/05 to 11% in 2005/06. An estimated 3% gain is used for 1988/89–1993/94.

Indicator 18 – Jobs & Communities

Sources

Statistics Canada. Labour force survey.

<http://www.statcan.ca/start.html> (Indicator 18-1)

Tourism British Columbia. January 2005. Characteristics of the commercial nature-based tourism industry in British Columbia.

<http://www.tourismbc.com/PDF/Characteristics of Commercial Nature-Based Tourism.pdf>

(Indicator 18-1)

BC Stats. August 2005. British Columbia's hunting, trapping and wildlife viewing sector.

http://www.bcstats.gov.bc.ca/data/bus_stat/busind/fish/wildlife.pdf (Indicator 18-1)

B.C. Wilderness Tourism Association.

<http://www.wilderness-tourism.bc.ca/main.html> (Indicator 18-1)

Statistics Canada. 2001 Census of Canada. (prepared by BC Stats)

<http://www12.statcan.ca/english/census01/home/index.cfm> (Indicator 18-2)

Tourism British Columbia. January 2005. Characteristics of the commercial nature-based tourism industry in British Columbia.

<http://www.tourismbc.com/PDF/Characteristics of Commercial Nature-Based Tourism.pdf>

(Indicator 18-2)

Horne, Garry. 2004. British Columbia's heartland at the dawn of the 21st century: 2001 economic dependencies and impact ratios for 63 local areas. BC Stats, Ministry of Labour & Citizens' Services. Victoria, B.C.

http://www.bcstats.gov.bc.ca/pubs/econ_dep.asp (Indicator 18-3)

BC Stats. BC municipal population estimates, 1996-2005, sorted by name.
<http://www.bcstats.gov.bc.ca/data/pop/pop/estspop.asp> (Indicator 18-3)

WorkSafeBC. Statistical Services Department.
<http://www.worksafebc.com/default.asp> (Indicator 18-4)

BC Stats. Consumer Price Index.
http://www.bcstats.gov.bc.ca/pubs/pr_cpi.asp (Indicator 18-4)

Notes

Indicator 18-1:

1. Data for Forestry & Logging, Wood Manufacturing, and Pulp & Paper are estimated monthly and averaged annually by Statistics Canada. From 1987 to 2004, data are considered reliable, and are based on the North American Industry Classification System (NAICS) categories and stable survey definitions (green shaded area in data table). Between 1976 and 1986, employment corresponds to the Standard Industrial Classification (SIC) categories, for which survey techniques changed somewhat from year to year. Data before 1976 are from Ministry of Forests files based on data from Statistics Canada. Comparisons of the early data with data from 1987 onward may not be reliable.
2. Data for cattle ranching are from Statistics Canada for 1987–2004.
3. Data for nature-based tourism are estimated from Statistics Canada data for 1987–2004 and other sources. Total direct employment in 2001 was 13,927 full-time equivalents (Table 3 in Characteristics of the Commercial Nature Based Tourism Industry in British Columbia). The number of full-time workers in the closest Statistics Canada industry sector averaged 78% (1987/04), and if we assume that part time is 3 months, then the FTE estimate converts to $13,927 * (.78 + .22 * 4) = 23,119$ persons. British Columbia's *Hunting, Trapping and Wildlife Viewing Sector* reports persons employed in several of the key nature-based tourism industries. This employment for 2001 was given an index value=1, and other years scaled proportionately. This index value for a given year was multiplied by the total person-year estimate for nature-based tourism to derive the annual employment.
4. The share of nature-based tourism that is forest-based involves identifying those activities that are explicitly addressed in forest management decisions (e.g. visual quality objectives), and those wilderness-based activities for which forests (directly) play a critical role. Based on revenue figures for 20 nature-based tourism industries, of which 6 were considered not forest-related, the forest-based share was estimated at 80% of nature-based tourism. This factor was applied to the nature-based tourism employment figures to find forest-based tourism employment.
5. Data for cattle ranching and nature-based tourism for 1970–1986 are based on the average for the years 1987–2004. It is conceivable that there was more ranching, hunting and fishing in the early years, however, there was also less wilderness tourism (the B.C. Wilderness Tourism Association reports that wilderness tourism represented 10% of the B.C. tourism industry revenue as of 1999, and is growing at 9-10% per year). The net effect is therefore equally likely to have been no significant change in the sum of these industries.

Indicator 18-2:

6. For Forestry and Logging, Wood Manufacturing, and Pulp and Paper: The 2001 *Census of Canada*, reported total labour income by industry, earned by respondents in the year 2000.

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7. For Cattle Ranching: Average employment income is based on dividing employment income by the number of persons with employment income (full-time, part-time and those unemployed at the time of the census). It is therefore less than the average income of someone employed full-time.
 8. For Nature-Based Tourism: The labour force statistics (for selected subsectors that amounted to 80% of total nature-based tourism) are from Indicator 18-1. These were multiplied by the average income reported in Census 2001, yielding an estimated aggregate income of \$285 million from nature-based tourism that is forest-based. This is reasonably consistent with the income of \$321 million for all nature-based tourism found by a survey taken in 2001, reported in *Characteristics of Commercial Nature-Based Tourism in British Columbia*.
 9. There is no basis at this time to estimate aggregate employment income from non-timber forest products.

Indicator 18-3:

10. The Forest Vulnerability Index (FVI) in 2001 *Economic Dependencies and Impact Ratios* for 63 Local Areas indicates the vulnerability of each local area to potential downturns in the forest sector (specifically, timber-based industries). A community is likely to be vulnerable to potential downturns if its basic income dependence on the sector is high and its diversity of basic incomes is low. The index is calculated by multiplying each local area's basic income dependence on the timber-based sector by (100 – its diversity index), and then normalizing the products for all local areas so that the highest vulnerability is assigned 100 and the lowest is 0.
11. The income dependency rankings are based on the premise that each dollar of basic community income is uniquely allocated either to one of the basic industries or to a non-employment income source. Thus the industry definitions are quite broadly defined to include not only resource extraction, but also any downstream processing that occurs locally, and also any indirect activities that are purchased locally.
12. Population counts and municipal boundaries for each community are as of July 1st, 2001. The data includes an estimate of net census undercount.

Type of Community:

C = City, T = Town, VL = Village, DM = District Municipality, IM = Island Municipality

Indicator 18-4:

13. The Forestry industry includes the following subsectors: logging and related (7030), wood mills (7140) and "classification units" (a unit within a subsector): log towing (732024), helicopter logging (732043) and log hauling (732044).
14. Benefits include all claim costs except health care and rehabilitation costs. The claims count includes claims accepted in the year regardless of year of injury. Health-care-only claims are not included in the count. The days lost include all days lost in the year regardless of the year of injury.
15. One person-year is the equivalent of 52 paid weeks of employment, whether worked by one individual or several. Estimates of person-years are based on gross payrolls submitted by employers and on matching wage rate data. In the past, the wage rate data was based on Statistics Canada information published for the 1980 Standard Industrial Classification. Wage rate data is now partly based on Statistics Canada information published on the NAICS (North American Industry Classification System) basis, and partly on the wage rates of STD claimants (including short term disability, long term disability and fatal).

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16. The *Workers Compensation Amendment Act*, (No. 2), 2002 (Bill 63) expanded coverage in 1994 by adding about 10% to the covered workforce. The non-forestry fatality rates for 1987-1993 have been adjusted to approximate the 'including Bill 63' basis and so are approximately comparable to the non-forestry fatality rates for 1994-2005.
 17. Injury rates are commonly expressed as 'per 100 personyears', but because fatalities occur less frequently, fatality rates are often expressed as 'per 10,000 personyears.'

Indicator 19 – First Nations Involvement

Sources

B.C. Ministry of Forests and Range. First Nations Tenure Information (FNTI) database (available only in the ministry). (Indicator 19-1)

Statistics Canada. Employment data for 1981, 1991 and 2001 (custom data request). (Indicator 19-2)

BC Stats. 2001 Census Profile, British Columbia.
http://www.bcstats.gov.bc.ca/data/cen01/profiles/csd_txt.htm (Indicator 19-2)

B.C. Ministry of Forests and Range. Aboriginal Affairs Branch. Agreements with First Nations.
http://www.for.gov.bc.ca/haa/FN_Agreements.htm (Indicator 19-3)

Indian and Northern Affairs Canada. First Nations profiles.
http://sdiprod2.inac.gc.ca/FNProfiles/FNProfiles_home.htm (Indicator 19-4)
For bands in B.C.:
http://sdiprod2.inac.gc.ca/FNProfiles/FNProfiles_List.asp?Province1=BC_ (Indicator 19-4)

Notes

Indicator 19-1:

1. Volumes of timber tenures shared with others are prorated for the share held by First Nations.
2. Volumes are prorated over the term of the tenure.
3. Volumes are based on permitted harvest, not actual harvest.
4. Data for 1980 to 2003 are as of February 9, 2003. Data for 2005 include all licences active in 2005.

Indicator 19-2:

5. Aboriginal employment data presented in Indicator 19-2 are based on ethnic origin, including North American Indian, Métis and Inuit.
6. The high growth rates in the aboriginal population and its components are partly a result of increasing self-identification by aboriginals as being of aboriginal identity or aboriginal ethnic origin.
7. Census data on the aboriginal population are available for: 1) aboriginal identity (individuals identify themselves as aboriginal); and 2) aboriginal ethnic origin (an individual's ancestry includes one or more aboriginals). Both include North American Indian, Métis and Inuit. Aboriginal identity data are available only for the 1996 and 2001 censuses, and ethnic origin data are more comparable with previous censuses. To

provide data for a longer time period, Indicator 19-2 uses data based on aboriginal ethnic origin.

8. In recent years, most references to aboriginal population use aboriginal identity. In 2001, the aboriginal population of British Columbia was 170,025 (4.4% of the total population) based on aboriginal identity, and 222,335 (5.7% of the total population) based on ethnic origin. North American Indians are the largest component of the aboriginal population, with 118,290 (3.1% of the total population) based on aboriginal identity and 174,500 (4.5% of the total population) based on ethnic origin. Almost all of the remaining aboriginal population is Métis.

Indicator 19-3:

9. Forest and Range Agreements, introduced in 2003, provide for revenue-sharing and forest tenure opportunities for First Nations. The timber volume comes from unlogged timber from existing forest licences and from timber that will be made available once the province-wide timber reallocation process is completed. The ministry's approach to negotiating Forest and Range Agreements is outlined in the Strategic Approaches to Accommodation Policy.
http://www.for.gov.bc.ca/haa/Docs/Accomodation_Policy_final_draft_10.pdf
10. An amendment to the *Forest Act* in May 2002 allowed the Minister of Forests to invite First Nations to apply for forest licenses without competition. The timber volume for these licences comes from beetle-killed and fire-damaged timber as well as from unlogged timber from other forest licences. Details of the mandate and process are set out in the ministry's Direct Award Policy.
http://www.for.gov.bc.ca/haa/Docs/Interim_Direct_Award_Policy_Oct_31_2002.pdf
11. The number of agreements and number of First Nations with a type of agreement do not add to the totals reported as of March 31, 2006, in the main report. The data table includes agreements after that date. Also, one agreement may involve more than one First Nation and one First Nation may have more than one agreement.

Indicator 19-4:

12. Indian and Northern Affairs Canada (INAC) maintains a public database that identifies individual bands and provides general information about each band.
13. For 1990, 1995 and 2000, populations for individual bands are based on 1999 data from INAC and later data for a few bands not included in the 1999 data. For 2003, populations are from INAC data for December 31, 2002, and (for one band) March 31, 2003.
14. Chart points for other years were estimated by straight-line interpolation.

Indicator 21 – Law

Sources

Association of British Columbia Forest Professionals. 2004. *Forest Legislation and Policy Reference Guide 2004*. Vancouver, BC. (Indicator 21-1).

Association of British Columbia Forest Professionals. 1998. *Our First 50 Years*:
<http://www.rpf-bc.org/forestpract/forestpract.html> (Indicator 21-1)

Various public inquiries. See annex "Related Publications." (Indicator 21-1)

B.C. Ministry of Forests, Compliance and Enforcement Branch. *Annual Reports*.
<http://www.for.gov.bc.ca/hen/> (Indicator 21-2, 21-3)

B.C. Ministry of Environment. Unpublished data. (Indicator 21-3)

B.C. Ministry of Forests and Range, Forest Practices Branch. Forests and Range Evaluation Program.

<http://www.for.gov.bc.ca/hfp/frep/> (Indicator 21-4)

Notes

Indicator 21-1:

1. This selection of changes in British Columbia's forest law highlights milestones relevant to the evolution of a legal framework that supports sustainable forest management. It is not intended to be a comprehensive overview of British Columbia's forest law.

Indicator 21-2:

2. An inspection is an examination of activities or practices, and is used to determine whether the forest practices are carried out in compliance with statutory requirements. Inspections cover the obligations of both the licensees and the government. Inspections may or may not find violations of the law.
3. Reporting periods are mid-June to mid-June for 1995/96–1997/98; mid-June to March 31 for 1998/99 (9.5 months); and April 1 to March 31 for 1999/00–2005/06.
4. Data for 1997/98, 1998/99 and 1999/2000 were corrected as of June 2, 2004.

Indicator 21-3:

5. Reporting periods are mid-June to mid-June for 1995/96–1997/98; mid-June to March 31 for 1998/99 (9.5 months); and April 1 to March 31 for 1999/00–2005/06.
6. From 1995/96 to 1999/00, B.C. Ministry of Forests (MoF) Compliance and Enforcement Annual Reports reported on alleged contraventions that occurred within the year. Starting in 2000/01, they reported on enforcement actions within the year — a more accurate and thorough approach, since investigations into alleged contraventions sometimes reveal additional contraventions, clarify the nature of the contravention and may change the enforcement decision from that intended before the investigation.
7. Enforcement actions are used when an official determines that legislation requirements have been contravened and a formal sanction is warranted. Parties subject to enforcement actions have an avenue to challenge or appeal the action.
8. Compliance actions are used when an official has reasonable grounds to believe a contravention has occurred or may be about to occur, but that the situation does not warrant enforcement actions.
9. Stop Work Orders are not considered formal findings of contravention. Seizures and Forfeitures are not necessarily considered findings of contravention.
10. One contravention may result in more than one formal enforcement action. Alternatively, several contraventions may be addressed through a single formal enforcement action.

Indicator 21-4:

11. The information presented is a summary of the work of the B.C. Ministry of Forests and Range, Forests and Range Evaluation Program to March 31, 2007.
12. Reports on monitoring protocols and evaluation results are publicly available.

Indicator 24 – Certification

Sources

Canadian Sustainable Forestry Certification Coalition. 2006. Certification Status Report, December 19 2006.

http://www.certificationcanada.org/english/status_intentions/canada.php

(Indicator 24-1 to 24-4)

B.C. Ministry of Forests and Range, Forest Analysis and Inventory Branch. AAC database (available only in the ministry).

<http://www.for.gov.bc.ca/hts/tsr.htm> (Indicator 24-1 to 24-4)

B.C. Ministry of Forests and Range, Resource Tenures and Engineering Branch. Apportionment reports.

<http://www.for.gov.bc.ca/hth/apportionment/apportionment.htm> (Indicator 24-1 to 24-4)

Canadian Sustainable Forestry Certification Coalition. 2004. Certification Status Report, June 9 2004. (Indicator 24-2, 24-3)

Canadian Sustainable Forestry Certification Coalition. 2005. Certification Status Report, December 20 2005. (Indicator 24-2, 24-3)

Notes

Indicator 24-1:

1. Organizations that set forest certification standards used in B.C.:

CSA = Canadian Standards Association

FSC = Forest Stewardship Council

SFI = Sustainable Forestry Initiative

The organization that sets the environmental management system certification standard used in B.C.:

ISO = International Organization for Standardization

Many operations certified under CSA and SFI also have ISO certification.

2. The primary source is a compilation prepared for the Canadian Sustainable Forestry Certification Coalition. Adjustments were made for a few operations using B.C. Ministry of Forests and Range (MFR) information. A few areas are estimated.
3. Forest operations certified under more than one certification standard are counted only once in summaries of more than one standard.
4. Areas recorded by the primary source generally include the forest and non-forest land base (gross area). For tree farm licences with allocations of AAC to the licence holder, BCTS and future reallocation, MFR volume allocation information was used to proportionally estimate the area certified by the TFL holder.
5. Certification data are for forest operations certified as of December 2006.
6. Area available for certification is estimated using protected areas as of December 2002 (Indicator 11-2) and areas converted for agricultural, urban and other development estimated for 2000 (Indicator 1-1).

Indicator 24-2:

7. See Note 1 for Indicator 24.
8. See Note 2 for Indicator 24.
9. See Note 3 for Indicator 24.
10. See Note 4 for Indicator 24.
11. Certification data are compiled in three time periods, based on forest operations that were certified as of June 2004 (for January 1999 to June 2004), December 2005 (for July 2004 to December 2005) and December 2006 (for January 2006 to December 2006). Individual operations are added in the month of certification. Changes in data are recorded as beginning in the month of subsequent re-certification. Operations that discontinued their certification status during a period are not included for the whole period.
12. See Note 6 for Indicator 24.

Indicator 24-3:

13. See Note 1 for Indicator 24.
14. The primary source is a compilation prepared for the Canadian Sustainable Forestry Certification Coalition. Adjustments were made for a few operations using B.C. Ministry of Forests and Range (MFR) information. A few volumes are estimated.
15. See Note 3 for Indicator 24.
16. Volumes recorded by the primary source differ slightly from corresponding MFR information for some operations. For tree farm licences with allocations of AAC to the licence holder, BCTS and future reallocation, MFR volume allocation information was used for the volume certified by the TFL holder.
17. See Note 11 for Indicator 24.
18. The provincial allowable annual cut (AAC) includes all government-set AACs (timber supply areas, tree farm licences, woodlot licences and community forests) as of December 31 in each year.

Indicator 24-4:

19. See Note 1 for Indicator 24.
20. See Note 14 for Indicator 24.
21. See Note 3 for Indicator 24.
22. See Note 16 for Indicator 24.
23. See Note 11 for Indicator 24.
24. See Note 18 for Indicator 24.