



Forest Economy Trends and Economic Conditions on Haida Gwaii

Gowgaia Institute
2007

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published by
GOWGAIA INSTITUTE
Box 638
Queen Charlotte, HG
V0T 1S0

www.spruceroots.org

PRODUCTION CREDITS

John Broadhead - author, cartography, numbers
Cynthia Jones-Davies - research and database manager
Simon Davies - managing editor, design
Leslie Johnson - project administrator
Dave Leversee - senior GIS Modeller



with support from
South Moresby Forest Replacement Account

Forest Economy Trends

Over the past decade, the Gowgaia Institute has developed a comprehensive database of the volumes and values of logs shipped from Haida Gwaii for the period 1979–2004. Drawn from provincial government billing records and information from the Vancouver Log Market, the database contains over 250,000 entries containing values for the following data categories:

- timber mark
- license owner
- license type
- year logged
- species logged
- log grades
- volume logged
- stumpage paid
- waste assessed
- estimated raw log value inflation adjustment to 2004 (Canadian CPI)

Data for previous years are not readily available, but we are searching for it.

We have also created a spatial deconstruction of the logging history for the period 1900–2004, based on forest cover data, satellite imagery and archival air photos. This is a 1:20,000 scale GIS project, mapped at 1:50,000 scale for analysis and animation of annual logging. While it's no substitute for actual data, the model does support the correlation of the known spatial distribution of logging to the known average vol-

umes and values in order to generate reasonable and defensible estimates for the entire history of logging on the islands.

This booklet presents selected summaries of the database to illustrate the analysis.

Go to spruceroots.org for associated maps and other information, such as the animated logging history of Haida Gwaii.



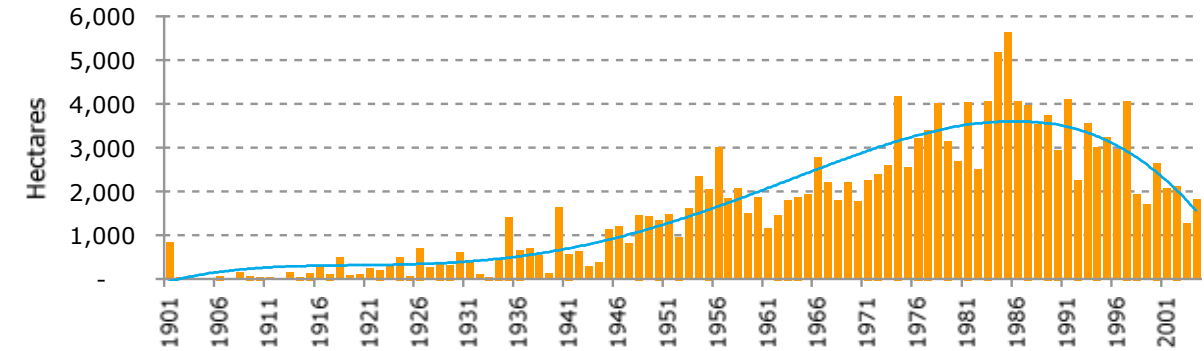
LOGGING HISTORY

The Gowgaia Institute has spatially deconstructed the history of logging on Haida Gwaii, in effect identifying the year in which areas were disturbed by logging throughout the islands. The image (left) is the final frame from an animated map, displaying logging in annual increments. The total forest area logged on Haida Gwaii in the past century is 168,750 hectares.

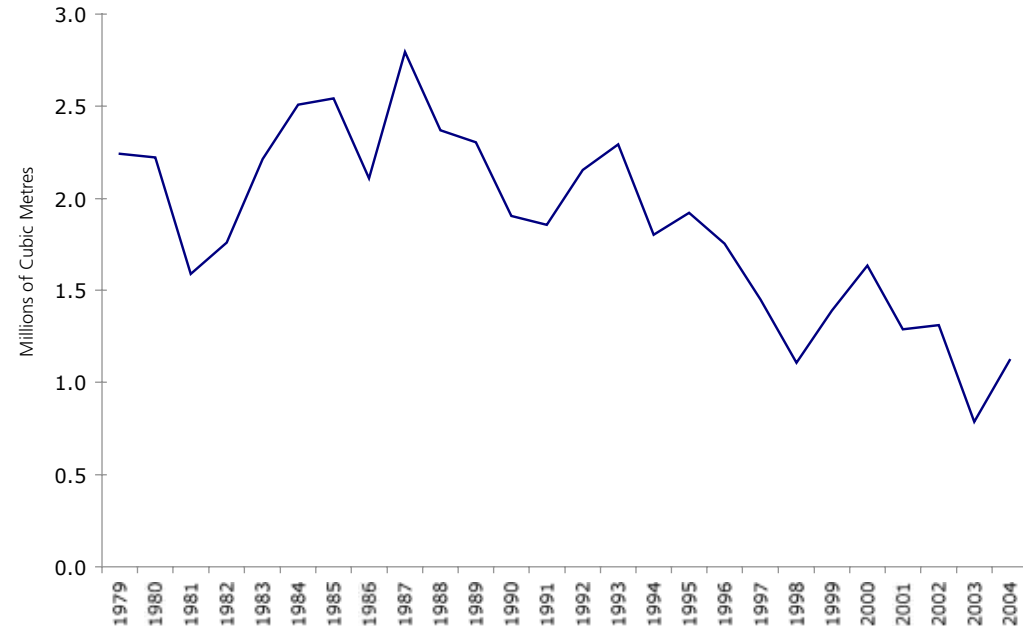
Source: Forest Cover data from BC Ministry of Forests and various licensees, Landsat TM imagery and archival photos (various years).

Note: the larger figure for 1901 contains the cumulative area logged in the preceeding 20 years by early settlers.

Haida Gwaii Logging History
area logged annually 1901-2004



TOTAL VOLUME - all species



VOLUMES AND VALUES

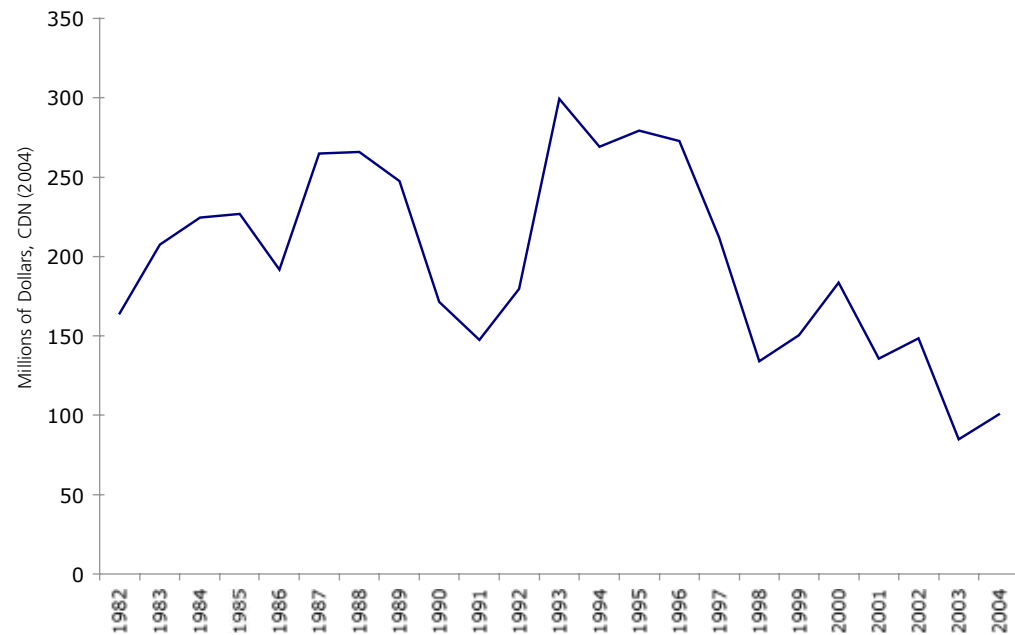
Detailed information about the volumes and values for all species has been collected and assembled in a database for the period 1979 to 2004. Data for earlier years is assumed to be archived on paper, but is not readily available.

Source: BC Ministry of Forests, Harvest Billings Database & Revenue Branch

The total volume of wood logged for the period is **48,439,726** cubic metres.

Correlating the average volume logged with the annual area logged yields an estimate of **101,033,929** cubic metres logged in the past century.

ESTIMATED LOG VALUES



THE VANCOUVER LOG MARKET

The Vancouver Log Market publishes quarterly reports of the value of log transactions by species, grade and value (beginning in 1924). The VLM is not an open, competitive log market, but simply reflects the value of transactions reported usually between divisions of vertically integrated companies or separate companies engaged in log trading to meet mill requirements.

Source: BC Ministry of Forests, Harvest Billings Database & Revenue Branch; Vancouver Log Market.

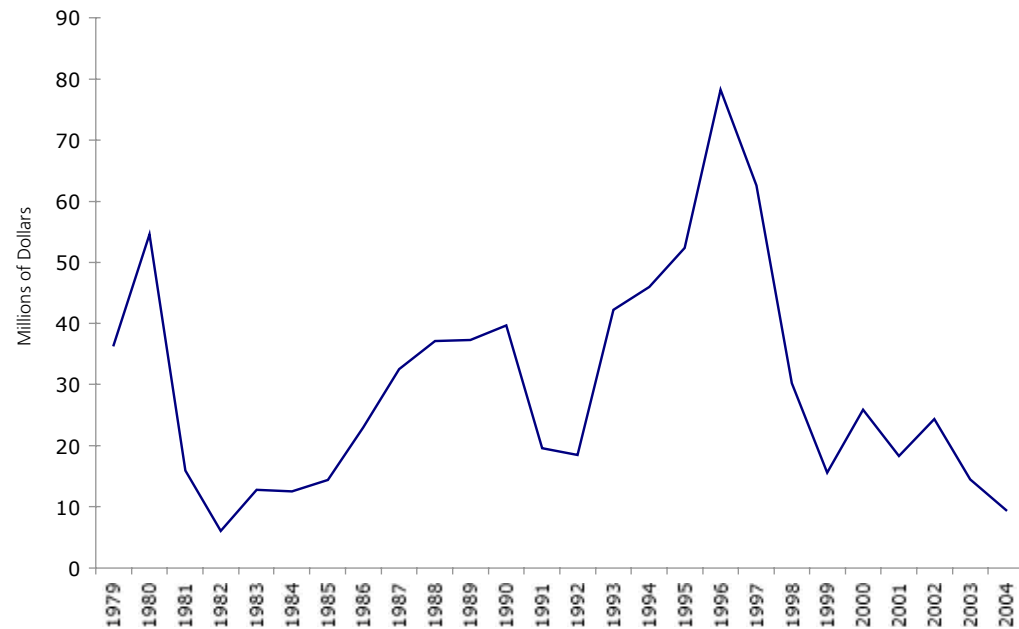
As such it is usually taken to be a very conservative estimate of raw log value only, and does not reflect actual market value or end product values (which vary upwards by 50 percent or more depending on log grade and utilization).

Nevertheless, the total estimated value of raw logs shipped from Haida Gwaii during the 1982-2004 period is \$4,561,861,634.

Correlating average volumes and values with the annual area logged yields an estimated total value of \$12,352,517,844 for raw logs shipped from Haida Gwaii in the past century.

As indicated on page 21 of the Environmental Conditions section this amount probably represents about 65 percent of the original *timber asset value* of Haida Gwaii. The second growth forest that has replaced it is currently unprofitable to log, and is estimated to be worth one tenth or less of the economic value of the old growth forest it has replaced.

TOTAL STUMPAGE - collected by province



STUMPAGE

Stumpage is the term for royalties charged by the province against timber harvested on public lands in BC. Logs are removed from the bush, delivered to the sort yard and measured for species, volume and log grade, and the scaler's report is submitted to the province, which assigns stumpage charges on a sliding scale depending on log value.

As can be seen in the table at right, stumpage rates are frequently adjusted by the province to address market conditions (ability to pay) and changing government policy objectives.

Stumpage revenues collected by the province from logging on Haida Gwaii during the 1979-2004 period totals **\$779,749,391**.

No stumpage data are available for earlier years, however correlating the average rate for the known period with the logging history yields a ballpark estimate of **\$1.8 billion** in revenue values to the province over the past century.

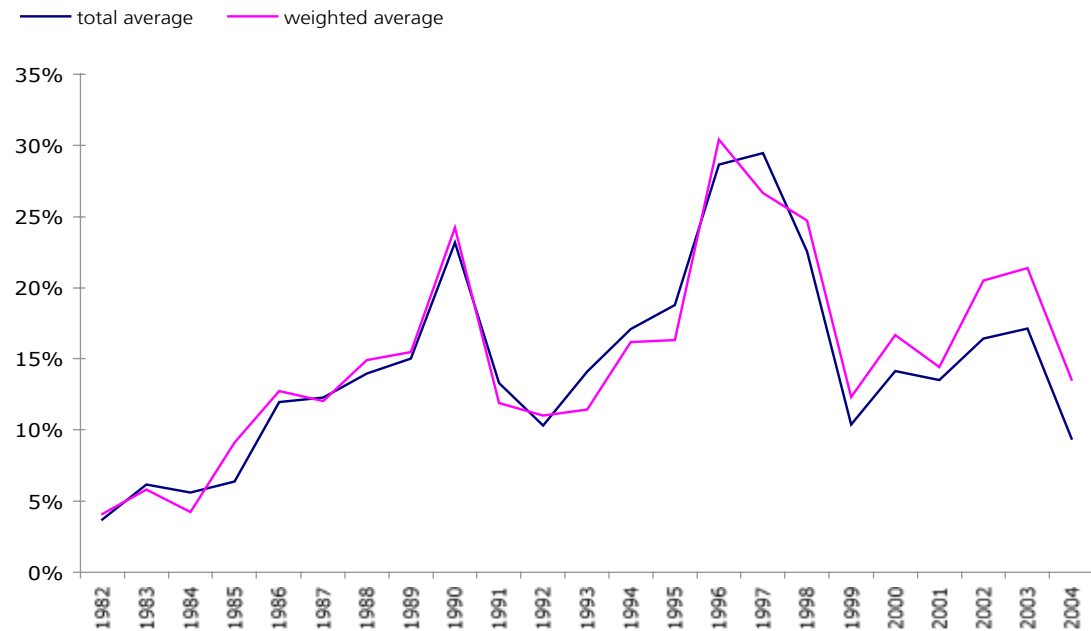
Average Annual Stumpage Rate Queen Charlotte Forest District dollars per cubic metre

1979	23.46	1992	7.84
1980	39.21	1993	15.89
1981	14.92	1994	23.67
1982	4.25	1995	24.39
1983	6.74	1996	40.68
1984	4.66	1997	37.06
1985	13.71	1998	24.12
1986	18.23	1999	10.82
1987	24.52	2000	15.42
1988	14.44	2001	12.38
1989	14.67	2002	18.71
1990	19.76	2003	18.37
1991	9.44	2004	9.53

weighted for species, grade and volume

Source: BC Ministry of Forests, Harvest Billings Database & Revenue Branch..

STUMPAGE as PERCENTAGE of LOG VALUE

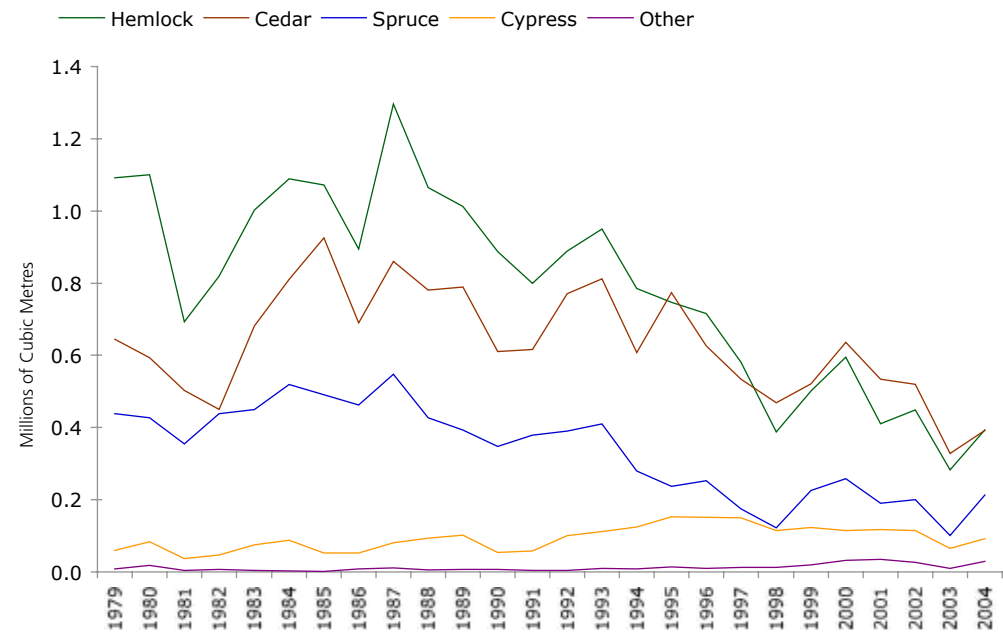


STUMPAGE

This figure presents another view of how stumpage rates are adjusted by the province to address market conditions and changing government policy objectives.

Source: BC Ministry of Forests, Harvest Billings Database & Revenue Branch; Vancouver Log Market.

SPECIES LOGGED - by volume



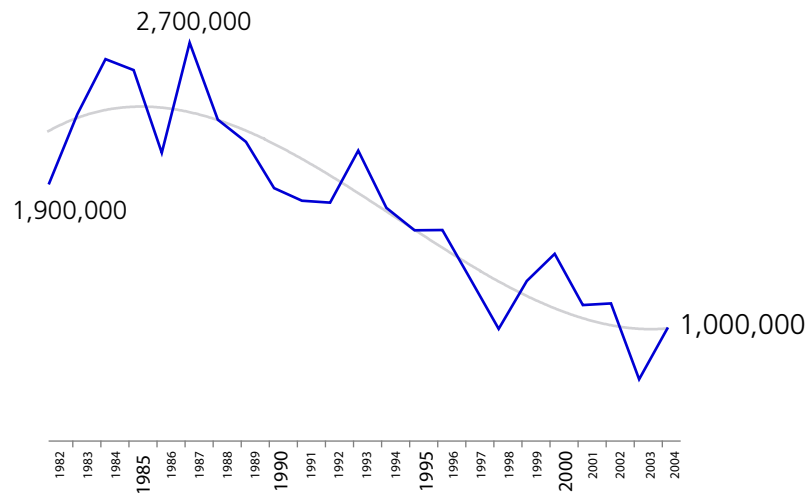
SPECIES LOGGED

In addition to volumes, market values and stumpage, our database supports detailed analysis of trees logged by species (shown here), log grades (about 20) and licensee.

Source: BC Ministry of Forests, Harvest Billings Database & Revenue Branch; Vancouver Log Market.

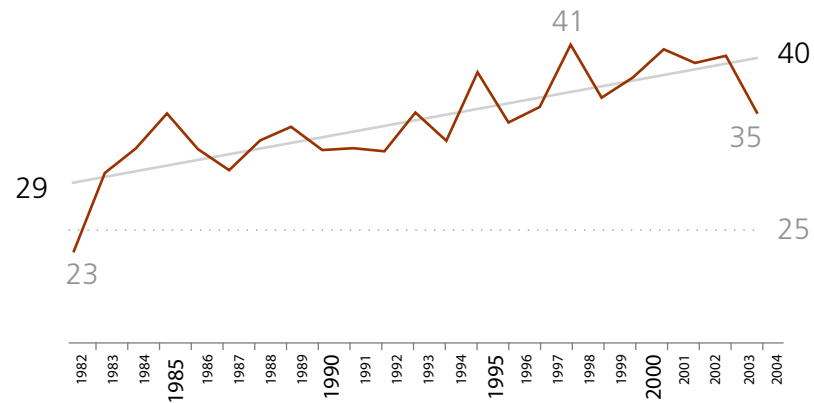
The following two pages present a sample analysis produced to shed some light on whether high quality cedar – the cornerpost of Haida culture – is becoming scarce as a result of logging.

TOTAL ANNUAL LOGGING - cubic metres



Over the past two decades, the rate of logging on Haida Gwaii has slowed by about 60 percent.

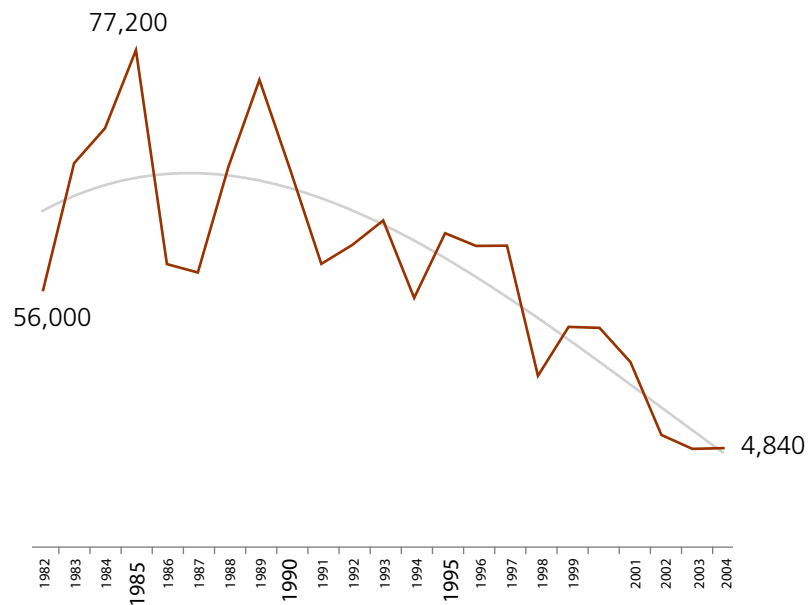
FOCUS ON CEDAR - as percentage of all species logged



Cedar is now about 40 percent by volume of all logs shipped from the Islands.

But it is only about 25 percent of the total forest inventory.

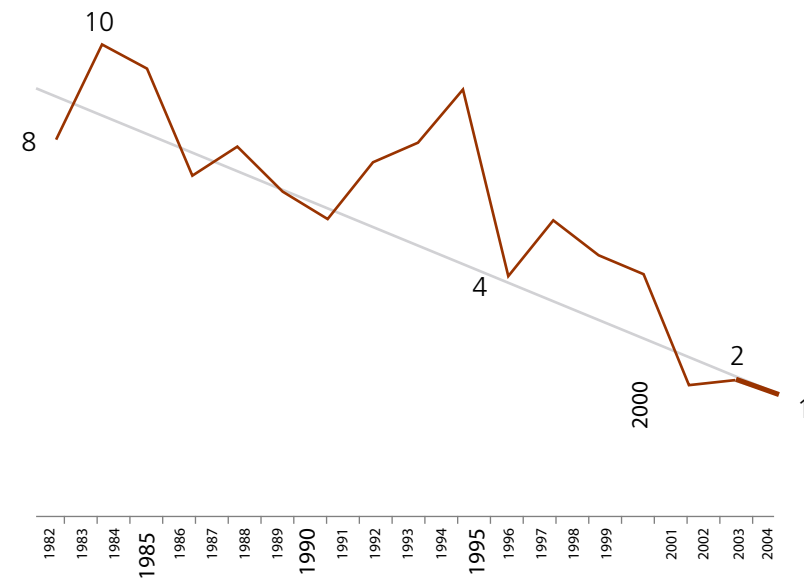
HIGH GRADE CEDAR LOGS - annual volume scaled, cubic metres



The volume of high quality cedar logs (grades B and D) found in the cut has declined by a factor of ten.

In other words, although the logging industry is targetting cedar stands, high quality logs are disappearing from the forest.

HIGH GRADE CEDAR LOGS - as percentage of all cedar



The data confirm the experience of Haida carvers, who report increasing difficulty in finding trees suitable for canoes and monumental poles.

ENVIRONMENTAL CONDITIONS

The Haida Gwaii–QCI Land Use Plan process examined a number of indicators of environmental condition. A ten-person Process Technical Team combined the expertise of technical experts from industry, provincial and Haida agencies, Gowgaia Institute and private consultants. Biophysical models, maps and risk assessments were produced in a four-part report:

Chapter I: provides an overview of the rationale and context for the report, natural disturbance information for the islands, and a summary of the ecosystem mapping used in the analysis.

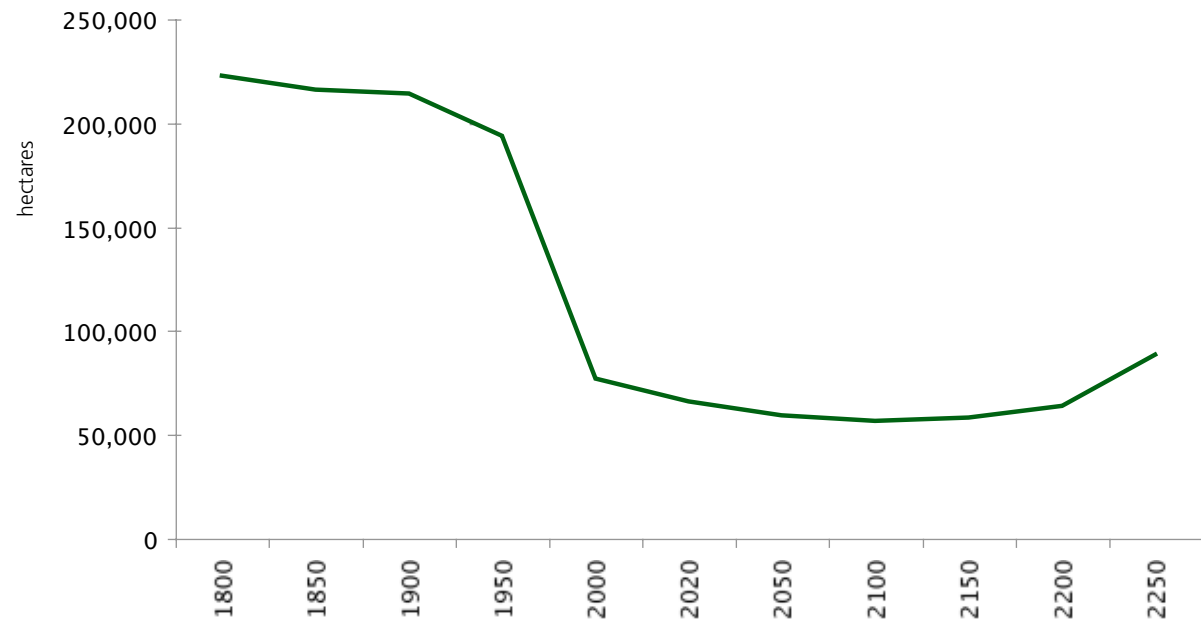
Chapter II: provides the condition and trends analysis results for the selected indicators: old growth forests, plant species and communities, watershed condition, cedar, northern goshawk, marbled murrelet, black bear, salmonids, and key introduced species.

Chapter III: summarises additional species and elements of management concern, which may be relevant to land use decisions. Most of the elements in this chapter are not sufficiently well known to undertake the more detailed overview or modeling performed for indicators in Chapter II. Each indicator is presented in a separate subsection.

Chapter IV: provides detailed technical information about the indicator modeling reported in Chapter II.

This section of the booklet presents selected summaries of three indicators: old growth forest, marbled murrelet habitat, and riparian forest/watershed condition.

OLD GROWTH FOREST SUPPLY TREND - good & medium sites - all Haida Gwaii



ENVIRONMENTAL CONDITIONS - OLD GROWTH FOREST SUPPLY TREND

The Haida Gwaii-QCI Land Use Plan process examined the condition (or supply) of old growth forest types on the Islands, known as a *coarse filter approach* to assessing biodiversity condition.

A GIS backcast model of forest types in the year 1800 AD was created from forest cover information, in essence a digital restoration of about forty kinds of forest (Old Growth Analysis Units) to pre-logging condition. Disturbance – primarily from logging – was measured at selected intervals. Future logging was forecast with a spatial timber supply model, assuming that current forest management practices would continue.

Almost all logging on Haida Gwaii has occurred in good and medium quality forest stands, leading in Western Hemlock, Sitka Spruce or Western Red Cedar trees. These are also the forest types with the highest habitat and Haida cultural values.

The area of good and medium forest sites on Haida Gwaii is 222,703 hectares, 65 percent of which have been logged to date. On the Skidegate Plateau in central Haida Gwaii, where the majority of logging has occurred, 74 percent has been logged. Which means that 65 to 74 percent of the best places for salmon, bear, birds, cedar, medicinal plants and people are gone – given the known paucity of

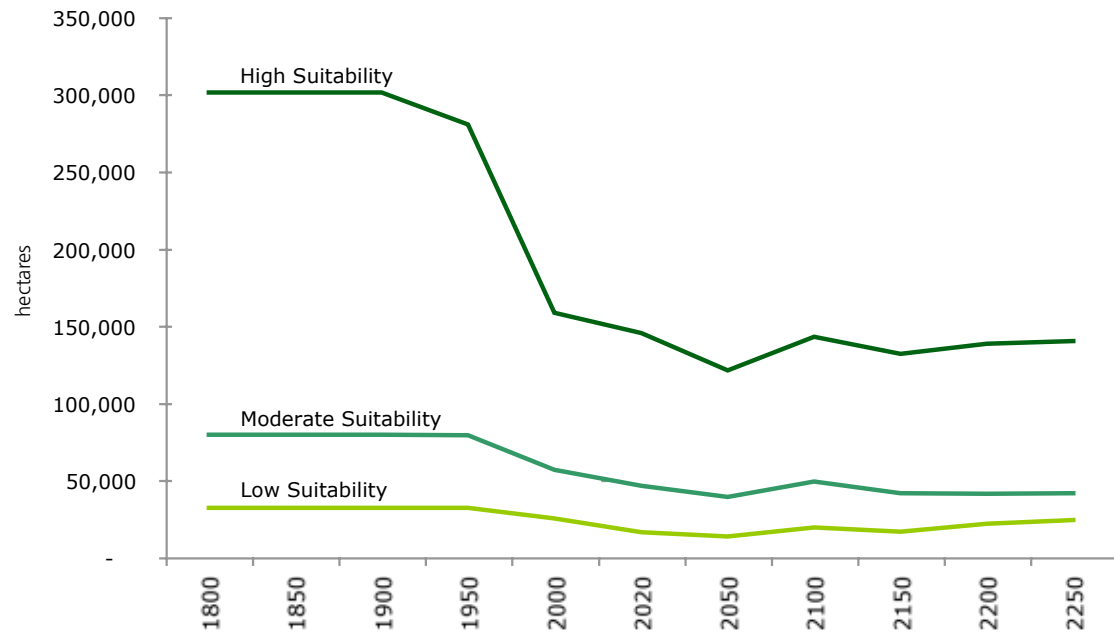
habitat values in second growth forests.

Old Growth Analysis Units (40) are derived from 1:20,000 scale data for site series, site index, leading tree species and biogeoclimatic subzones. The logging history is deconstructed at the same scale. The final supply analysis is modelled and mapped at 1:80,000 scale, with query results tabulated by ecosections (3), biogeoclimatic variants (5) and landscape units (25).

Forest site index is a measure of forest productivity based on soil and drainage characteristics and their combined effects on tree growth, and is summarily classed as good, medium, poor or low.

Source: Haida Gwaii-QCI Land Use Plan, Old Growth Condition Report; 2004.

MARBLED MURRELET HABITAT SUPPLY - all Haida Gwaii



ENVIRONMENTAL CONDITIONS - MARBLED MURRELET HABITAT SUPPLY

The Marbled Murrelet is a seabird that nests on mossy platforms in the upper canopy of old growth forests, and was chosen by the Land Use Plan process as a *fine filter indicator* of biodiversity, in part because it is listed as a Threatened Species due to habitat loss induced by logging.

A GIS model based on multiple variables (forest type, tree size, canopy closure, slope, elevation, etc) was produced to indicate areas of high, medium and low habitat suitability in the year 1800. Disturbance by historic and projected future logging was measured at selected intervals.

The area of highly suitable nesting habitat on Haida Gwaii is 300,829 hectares, 61 percent of which has been logged to date.

The impact varies with logging history from one landscape region to another, reaching 60 to 80 percent in the richest forest areas with the best nesting habitats.

Source: Haida Gwaii-QCI Land Use Plan, Marbled Murrelet Indicator Condition Report; 2004

The MaMu habitat supply model is based on 1:20,000 scale biophysical data and mapped at a scale of 1:80,000. Query results are broken out by Ecoregion (3), Biogeoclimatic Subzone Variant (6), Landscape Unit (25), and Management Unit (7).

Note: the slight increase in habitat suitability beyond 2050 is a projected outcome of highly suitable areas that have been logged and subsequently included in protected areas.

Risk Category	Landscape Unit Name	LANDSCAPE UNIT			RIPARIAN FOREST		
		area	area logged	% logged	RF area	RF logged	% logged
HIGH RISK >30 % logged	Skidegate Lake	53,404	33,684	63%	9,943	6,547	66%
	Masset Inlet	53,704	23,425	44%	7,348	3,568	49%
	Yakoun Upper (Lk)	26,905	9,431	35%	5,198	1,662	32%
	Honna	30,752	10,655	35%	4,159	1,603	39%
	Louise Island	27,387	9,407	34%	3,732	1,579	42%
	Yakoun Lower	30,437	10,438	34%	5,306	1,800	34%
	Lyell Island Group	23,450	7,563	32%	2,960	1,307	44%
	sub-total	246,038	104,602	43%	38,644	18,064	47%
MEDIUM RISK 20–30 % logged	Sewell	48,684	13,189	27%	8,241	2,904	35%
	Eden Lake	50,344	11,587	23%	8,049	1,947	24%
	Tasu	33,859	5,803	17%	5,894	1,178	20%
	sub-total	132,887	30,579	23%	22,183	6,029	27%
SOME RISK 10-19 % logged	Ian	32,333	5,304	16%	4,540	669	15%
	Tlell	41,445	4,254	10%	5,315	496	9%
	sub-total	73,778	9,558	13%	9,855	1,165	12%
LOW RISK <10 % logged	Rennell	41,075	3,202	8%	7,020	731	10%
	Skincuttle	39,182	2,565	7%	4,197	503	12%
	Otun	72,913	2,826	4%	13,451	455	3%
	Naikoon	111,550	4,229	4%	17,284	487	3%
	Hibben	45,297	1,285	3%	6,550	431	7%
	Gudal	29,176	776	3%	4,994	245	5%
	Beresford	57,802	1,395	2%	10,587	231	2%
	Bigsby	20,132	106	1%	3,034	19	1%
	Jalun	31,604	30	0%	6,472	4	0%
	Athlow Bay	48,086	-	0%	8,448	-	0%
	Gowgaia	41,102	-	0%	6,573	-	0%
	Kunghit Island	12,906	-	0%	1,116	-	0%
	sub-total	550,822	16,413	3%	89,725	3,105	3%
TOTAL		1,003,525	161,152	16%	160,407	28,363	18%

ENVIRONMENTAL CONDITIONS - RIPARIAN FOREST/WATERSHED CONDITION

Riparian Fish Forest habitat is a key environmental indicator for Haida and other members of the Land Use Planning Forum. The Gowgaia Institute prepared the “Portrait of Salmon and Riparian Fish Forest on Haida Gwaii” which maps the distribution of resident and anadromous fish and the riparian forests adjacent to their freshwater habitats.

Riparian forest area was compared to logging history, and a risk assessment produced (see table) for various Landscape and Watershed Units. In essence, every major salmon run of cultural significance to the Haida is at high or medium risk.

Source: Haida Gwaii–QCI Land Use Plan, Riparian Condition Report; 2004

The Salmon and Riparian Habitat model is based on biophysical data and mapped at a scale of 1:20,000. Query results are broken out by Ecosection (3), Landscape Unit (25), Watershed Unit (145) and Management Unit (7).

