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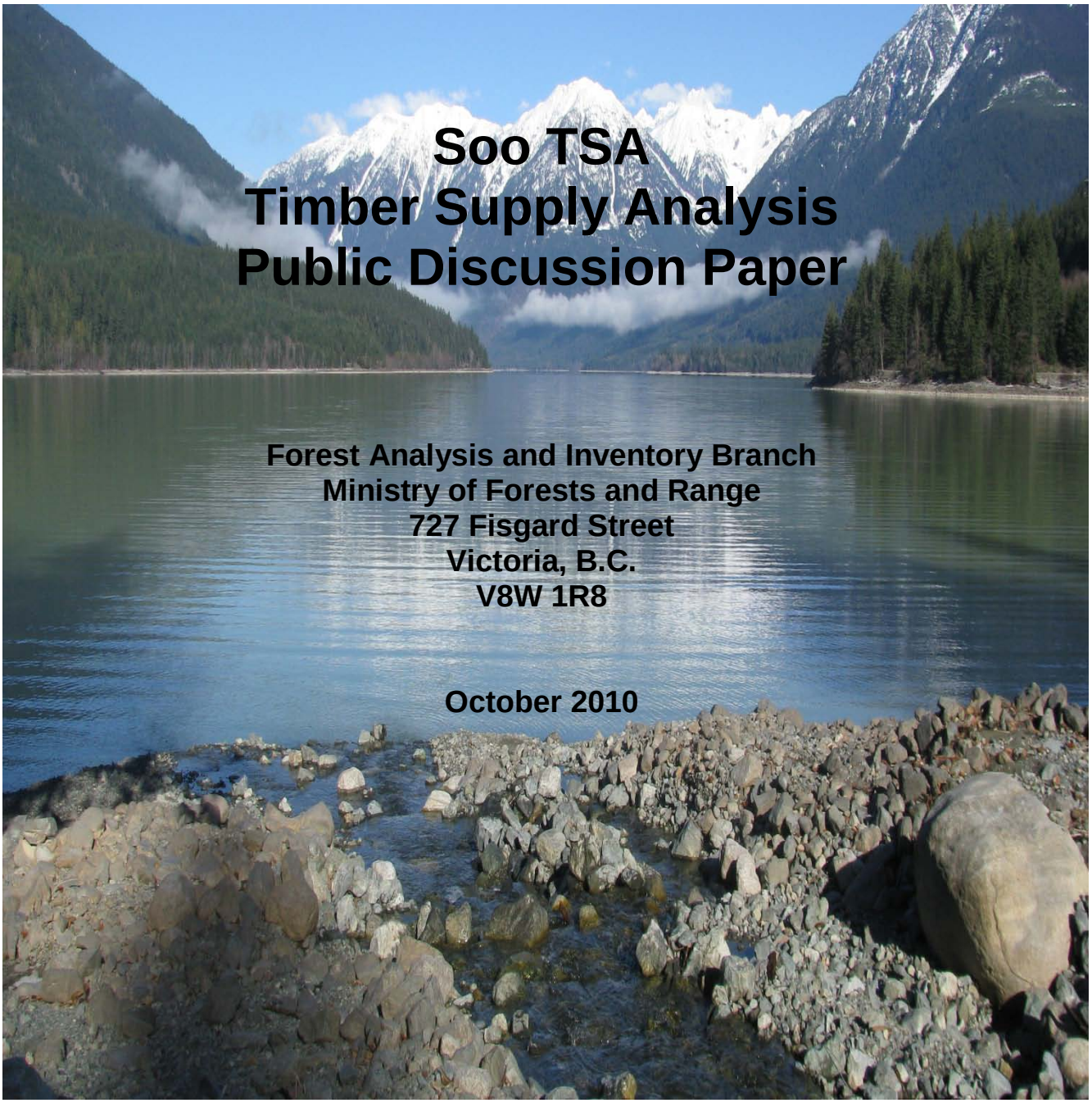

Soo TSA
Timber Supply Analysis
Public Discussion Paper

Forest Analysis and Inventory Branch
Ministry of Forests and Range
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October 2010

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Soo TSA Public Discussion Paper

Introduction

The British Columbia Ministry of Forests and Range regularly reviews the timber supply[a] for all timber supply areas[b] (TSA) and tree farm licences[c] (TFL) in the province. This review for the Soo TSA, examines the impacts of current forest management practices on the timber supply, economy, environment and social conditions of the local area and the province. Based on this review, the chief forester will determine a new allowable annual cut[d] (AAC) for the Soo TSA.

According to Section 8 of the *Forest Act* the chief forester must regularly review and set new AACs for all 37 TSAs and 34 TFLs in the Province of British Columbia.

The objectives of the timber supply review are to:

- examine relevant forest management practices, environmental and social factors, and input from First Nations, forest licensees and the public;
- set a new AAC; and
- identify information to be improved for future timber supply reviews.

This public discussion paper provides a summary of the results of the timber supply analysis for the timber supply review of the Soo TSA. Details about the information used in the analysis are provided in a September 2008 data package. The timber supply analysis should be viewed as a "work in progress". Prior to the chief forester's AAC determination for the TSA, further analysis may need to be completed and existing analysis reassessed as a result of inputs received during this review process.

Timber supply review in the Soo TSA

The current AAC for the Soo TSA, effective October 1, 2000, is 503 000 cubic metres. A partition of at least 90 000 cubic metres (17.9 percent) was specified as attributable to the helicopter-operable land base. In March 2004, the chief forester postponed the AAC determination to September 30, 2010 under Section 8(3.1) of the *Forest Act.*

In September 2008, a data package documenting the information requirements and assumptions for the timber supply analysis was released for public review and to assist with First Nations' consultation. This public discussion paper is being released to provide an overview of the timber supply review process and to highlight the results of the timber supply analysis, including harvest forecasts for the Soo TSA.

[a] **Timber supply**
The amount of timber that is forecast to be available for harvesting over a specified time period, under a particular management regime.

[b] **Timber supply areas (TSAs)**
An integrated resource management unit established in accordance with Section 7 of the Forest Act.

[c] **Tree farm licences (TFLs)**
Provides rights to harvest timber and outlines responsibilities for forest management in a particular area.

[d] **Allowable annual cut (AAC)**
The rate of timber harvest permitted each year from a specified area of land, usually expressed as cubic metres of wood.

Before setting a new AAC, the chief forester will review all relevant information, including the results of the timber supply analysis, socio-economic information, and input from government agencies, the public, licensees and First Nations. Following this review, the chief forester's determination will be outlined in a rationale statement that will be publicly available. The actual AAC that is determined by the chief forester during this timber supply review may differ from the harvest projections presented in this analysis, as the chief forester must consider a wide range of information including the social, economic and environmental implications associated with a given harvest level. His considerations are ultimately a professional judgement based on the legal requirements set out in Section 8(8) of the *Forest Act.*

Once the chief forester has determined the new AAC, the Minister of Forests and Range will apportion the AAC to the various licence types and programs. Based on the minister's apportionment, the regional executive director will establish a disposition plan that identifies how the available timber volume is assigned to the existing forest licences and, where possible, to new opportunities.

Description of the Soo TSA

Located on the south coast of British Columbia, immediately north of the City of Vancouver, the Soo TSA is part of the Coast Forest Region and is administered by the Squamish Forest District office.

The total area of the TSA is 909 000 hectares of which about 254 000 hectares is productive forest land managed by the Crown. Of the Crown forested land base (CFLB) about 98 000 hectares (39 percent) is available for timber harvesting and is referred to as the timber harvesting land base (THLB).

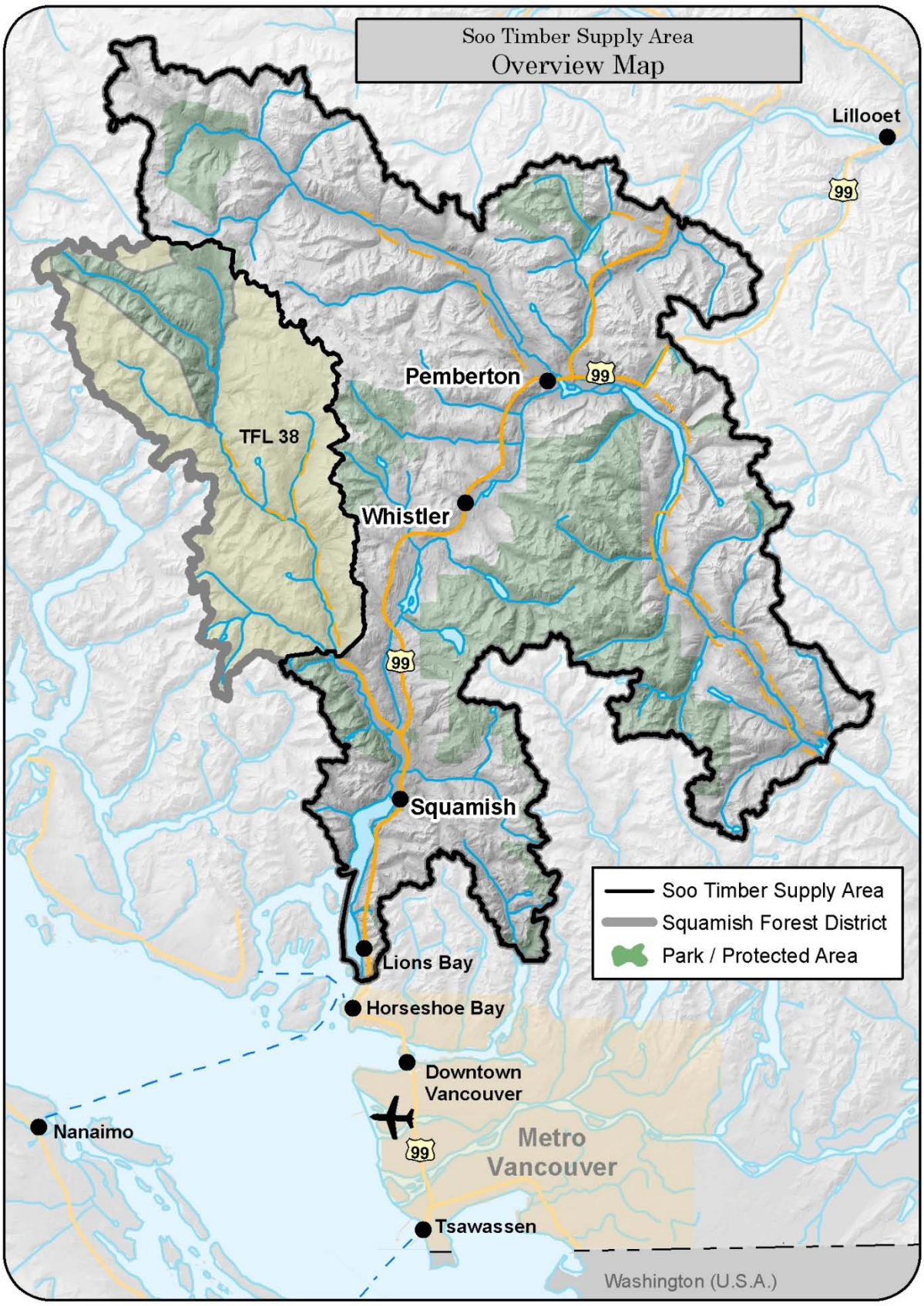

Figure 1. Soo TSA map.

Natural resources

The Soo TSA corresponds to the drainages of the lower Squamish and Cheakamus Rivers, which flow into Howe Sound, and the Lillooet River, which flows into Harrison Lake. The Soo TSA is bounded on the west by TFL 38 and the Sunshine Coast TSA; on the north and northwest by the Lillooet TSA; and on the south and east by the Fraser TSA. The communities of Lions Bay, Squamish, Whistler, and Pemberton, as well as many smaller communities are located in this TSA.

The Soo TSA has a wide range in climate (from coastal to interior) and elevation (from sea level to 2900 metres). The TSA is ecologically diverse including five biogeoclimatic zones: coastal western hemlock, mountain hemlock, Engelmann spruce-subalpine fir, interior Douglas-fir and alpine tundra. The major commercial tree species within the THLB, in order of magnitude are: Douglas-fir, balsam, hemlock, cedar, spruce, cottonwood and pine (see Figure 2). After harvest, most stands are expected to be regenerated to the same species, except the more productive hemlock and balsam sites, which will be mostly regenerated to fir, cedar and spruce.

The mature forests of this TSA support about 130 wildlife species. Mammals known to occur in the TSA include: grizzly and black bears, moose, mule and black-tailed deer, mountain goat, cougar and gray wolf. Forested areas are home to bird species such as the northern spotted owl, northern flicker, hairy woodpecker and various songbirds. The spotted owl is designated as an endangered species in Canada and is known to occur within the Soo TSA. The Stawamus Chief is a known peregrine falcon nesting area. Harvested areas provide habitat for blue grouse, cedar waxwings, and songbirds. The nutrient-rich, protected waters of the Squamish estuary provide shelter for various ducks, swans, geese and gulls. In addition, the many fish-bearing waters support a range of predators including the common merganser, Barrow's goldeneye and bald eagle. Portions of the Soo TSA are also within the range of the marbled murrelet.

Four major river systems support salmon species (sockeye, coho, chum, pink and chinook), other salmonids (such as steelhead, cutthroat trout, kokanee, rainbow trout, bull trout, mountain whitefish and Dolly Varden char) and non-salmonids (such as sculpin and stickleback). Valuable fish streams are present in the Soo TSA; however, in some instances, fisheries potential is limited by rapid stream flow, extreme flow variation, and low temperatures and nutrients that are a function of the climate and rugged terrain in the area.

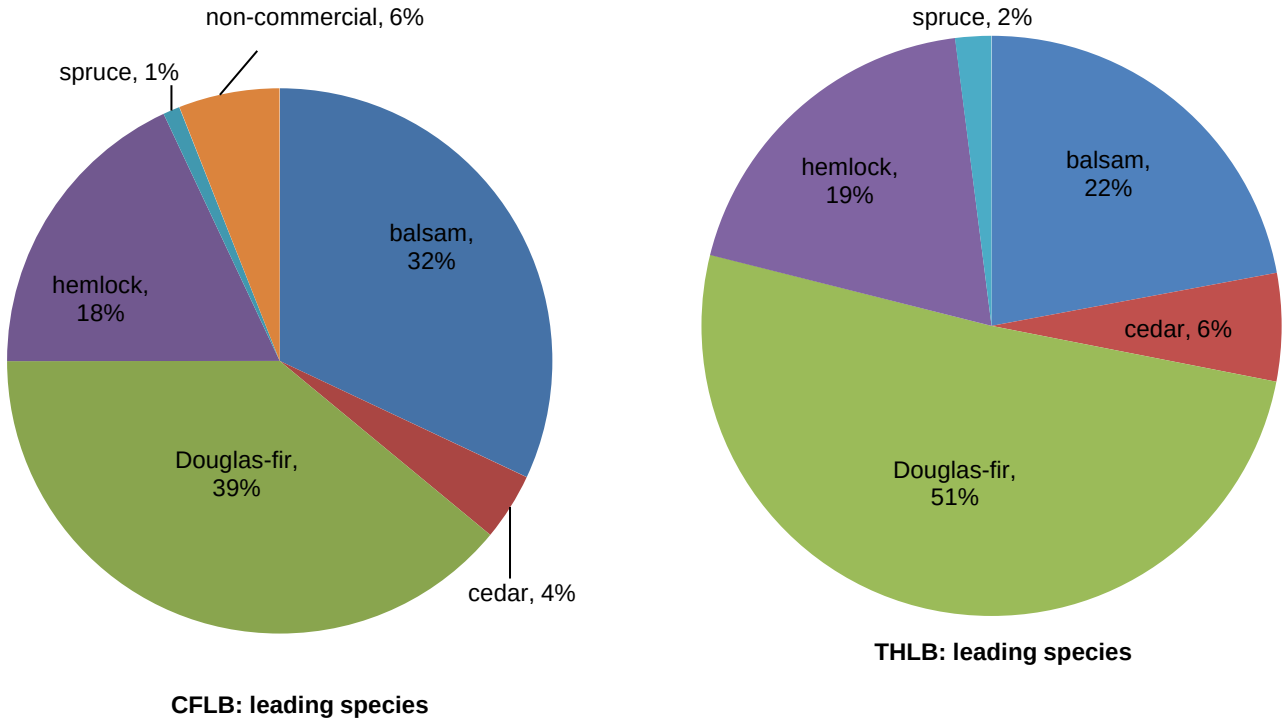

Figure 2. Proportion of leading species for the Crown forest land base and timber harvesting land base[e] of the Soo TSA.

First Nations

Seven First Nations have asserted traditional territories overlapping the Soo TSA. These include the Squamish Nation, In-SHUCK-ch Nation consisting of three First Nations, Douglas, Samahquam and Skatin First Nations, the Lil'wat (Mount Currie), the N'Quatqua (Anderson Lake Band), and the Tsleil Waututh Nations.

First Nations are actively involved in the forestry sector and currently control about 55 percent of the AAC in the Soo TSA. First Nations are also employed in forestry activities, such as timber harvesting, processing and silviculture. Through increased participation in the forest sector First Nations have greater involvement in forest management and management of cultural heritage resources.

The Lil'wat, Squamish, In-SHUCK-ch and Tsleil Waututh Nations signed the Sea to Sky Land and Resource Management Plan (SSLRMP) in 2008. This plan set aside four percent of the Soo TSA as conservancies for First Nations' cultural interests. The Lil'wat, In-SHUCK-ch and Squamish Nations have also signed Land Use Planning Agreements, which include strategic zoning and management direction that harmonizes First Nations' cultural, economic and conservation interests with the SSLRMP. They also includes provisions for processes and projects such as a small-scale forestry program, added protection for old growth and sensitive ecosystems, and commercial recreation development opportunities.

[e] **Timber harvesting land base (THLB)**
The portion of the CFLB that is managed for timber supply by the Ministry of Forests and Range where timber harvesting is considered both acceptable and economically feasible, given objectives for all relevant forest values, existing timber quality, market values and applicable technology.

The Tsleil Waututh Nation also signed the Partnership Agreement with the Province in 2005. The objective of this plan is to harmonize the Indian River Integrated Land and Resource Management Plan with the SSLRMP.

The N'Quatqua chose not to participate in the SSLRMP process; however, wild land areas have been set aside in N'Quatqua's traditional territory for wildlife, tourism and recreational values.

The Ministry of Forests and Range has been communicating with First Nations about this timber supply review and intends to continue to fulfill its legal obligations to consult with First Nations in conjunction with the release of this public discussion paper.

Land use plans

The Sea-to-Sky Land and Resource Management Plan (SSLRMP) is a sub-regional land use plan covering approximately 1 091 000 hectares to the north of Greater Vancouver and east of the Sunshine Coast. This area coincides with the boundaries of TFL 38 and the Soo TSA. The SSLRMP provides direction for future planning and management of natural resources, and a framework to resolve land use issues. The SSLRMP is built upon the outcomes of government-to-government discussions between the Province and First Nations, and on recommendations put forward by a public planning forum representing a range of resource sectors.

The Minister of Agriculture and Lands approved the Sea-to-Sky LRMP in April 2008.

Forest management

Current forest management must be consistent with the requirements of the *Forest and Range Practices Act* (FRPA) and associated regulations, which are designed to maintain a range of biodiversity and wildlife values. All forested lands, whether they contribute to timber supply or not, help to maintain critical habitats for many species. The timber supply analysis includes constraints or forest cover requirements for biodiversity, visual quality, wildlife habitat, community watersheds, recreation features, riparian management and protection of environmentally sensitive areas. These requirements are applied to the Crown forested land base (CFLB).

The productive forest land base in the Soo TSA is approximately 254 000 hectares. Of this area, about 25 percent is not available for timber harvesting because it occurs in, wildlife retention areas, culturally significant areas, or on unstable terrain. Another 36 percent is excluded from harvesting because it is occupied by non-merchantable species, uneconomic or otherwise unsuitable for timber harvesting; however, this land continues to provide for other values. The timber harvesting land base (THLB) is estimated to be about 98 000 hectares, which is 25 000 hectares smaller than the THLB in the previous timber supply analysis.

Land base and forest management changes since TSR 2

The last AAC determination occurred October 1, 2000. Since then, several changes have occurred to the land base and forest management information that are reflected in the timber supply analysis. The major changes are:

- implementation of the Sea-to-Sky Land and Resource Management Plan (LRMP) (April 2008);
- establishment of new parks, conservancies, and LRMP land use zones;
- improved (spatial) modelling of: landscape-level biodiversity requirements, riparian areas, known archaeological and cultural use areas, roads, and northern spotted owl special resource management zones;
- implementation of *Government Actions Regulation* (GAR) orders for deer, moose and mountain goat ungulate winter ranges, grizzly bear (also accounts for tailed frogs);
- five-year deferral of areas inaccessible due to the recent Meager Creek landslide;
- use of improved productivity estimates (site index adjustments) for second-growth stands;
- establishment of five new woodlots (W1786, W1929, W1930, W1985, W1986), Cheakamus Community Forest and Whistler and Blackcomb Controlled Recreation Areas;
- establishment of the Whistler Olympic Park; and
- change from *Forest Practices Code Act of BC* to *Forest and Range Practices Act*.

Timber supply analysis

For the AAC determination, the chief forester reviews many sources of information including a timber supply analysis that models the development of the forest through time and its response to harvesting while respecting government's many timber and non-timber objectives. This section highlights some of the important findings from the timber supply analysis.

The base case

A timber supply analysis provides an assessment of the existing land base and forest management information. This assessment includes a timber supply forecast that Ministry of Forests and Range staff believe reflects the best available data and current forest management practices. This timber supply forecast is called the base case. The base case is not an AAC recommendation, but rather one of many sources of information the chief forester will consider when setting the AAC. The AAC determined by the chief forester may be greater or less than the initial level forecasted in the base case.

The base case (Figure 3) shows that an initial harvest level of 503 000 cubic metres per year, which is the level of the current AAC, can be maintained for 30 years before increasing to 625 000 cubic metres. This level then gradually increases over a period of 100 years to the long-term harvest level of 830 000 cubic metres.

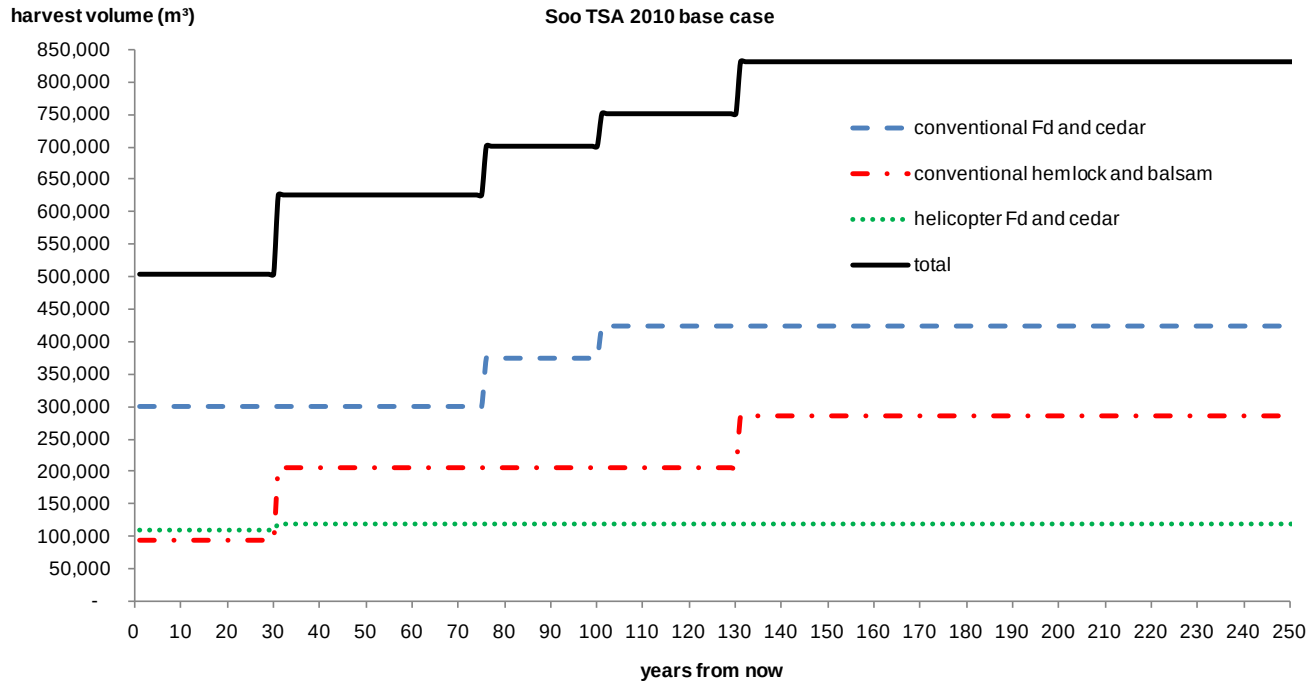

Figure 3. Base case timber supply forecast for the Soo TSA, 2010.

In order to reflect current harvest preferences, harvesting in the base case was assumed to occur in Douglas-fir-cedar stands harvestable using ground systems ('conventional') first, Douglas-fir-cedar stands harvestable by helicopter ('heli') second, and lastly in conventional hemlock-balsam stands. An additional 6000 hectares of heli hemlock-balsam and lower site index Douglas-fir stands may contribute to the harvest when market conditions improve.

The volume contribution of each stand type to the total harvest level (solid line) is shown in Figure 3. For example, in year 10 the total base case harvest level is 503 000 cubic metres of which 300 000 cubic metres is attributable to conventional Douglas-fir and cedar stands (long-dash line), and 100 000 cubic metres is attributable to each of the conventional hemlock and balsam (short-dash line) and helicopter accessible Douglas-fir and cedar (dotted line) stands.

Historic harvest performance

A comparison between the stand types contributing to the base case harvest levels and the historic harvest in the TSA, based on information from the Ministry of Forests and Range Harvest Billing System, indicates that during the seven-year period (2003-2009) an average of 55 percent of the AAC was harvested. The average contribution to the total harvest from each stand type for the seven-year period (2003-2009) was 76 percent and 23 percent from Douglas-fir or cedar-leading stands and hemlock or balsam-leading stands, respectively.

Table 1. Actual volume harvested per year compared to AAC and species composition of actual volume harvested (source MFR Harvest Billing System – October 2010)

Year	AAC (m^3)	Total volume harvested (m^3)	AAC harvested (%)	Douglas-fir or cedar-leading volume harvested/% total		Hemlock- or balsam-leading stands volume harvested/% total	
				(m^3)	(%)[1]	(m^3)	(%)[1]
2009	503,000	73,034	15	57,595	79	154,340	21
2008	503,000	134,884	27	107,845	80	20,591	17
2007	503,000	430,681	86	329,378	76	100,885	23
2006	503,000	297,407	59	257,478	87	39,929	13
2005	503,000	349,798	70	218,174	62	131,282	36
2004	503,000	468,753	93	356,803	76	111,116	24
2003	503,000	178,189	35	127,463	72	46,749	26
Average			55		76		23

1. Percentages of Douglas-fir/cedar-leading and hemlock/balsam leading do not always sum to 100% due to volume contributions from other stand types to actual volume harvested

According to the species composition of the timber harvesting land base (Figure 2) Douglas-fir and cedar-leading stands account for 57 percent and hemlock- and balsam-leading stands account for 41 percent of the stands in the THLB. Comparing this species composition information to the average species contribution to the average volume harvested annually between 2003 and 2009, suggests that over the last seven years the harvest of Douglas-fir and cedar-leading stands has been disproportional to their contribution to the species profile of the THLB.

In order to explore the effect of continuing the focus on harvesting Douglas-fir and cedar-leading stands disproportionately to their contribution to the species profile, the scenario in Figure 4 was prepared. This scenario tested how long an initial harvest level of 503 000 cubic metres per year – the current AAC – could be maintained if only conventional Douglas-fir – cedar stands are harvested.

The results indicate that the current AAC (solid line) can only be maintained for five years if only conventional Douglas-fir-cedar stands (short-dash line) are harvested in the short term. Accordingly, the base case harvest is predicated on the assumption that in addition to the conventional Douglas-fir-cedar stands, harvesting will also need to occur in both the conventional hemlock-balsam (dotted line) and the helicopter accessed Douglas-fir and cedar stands long-dash line).

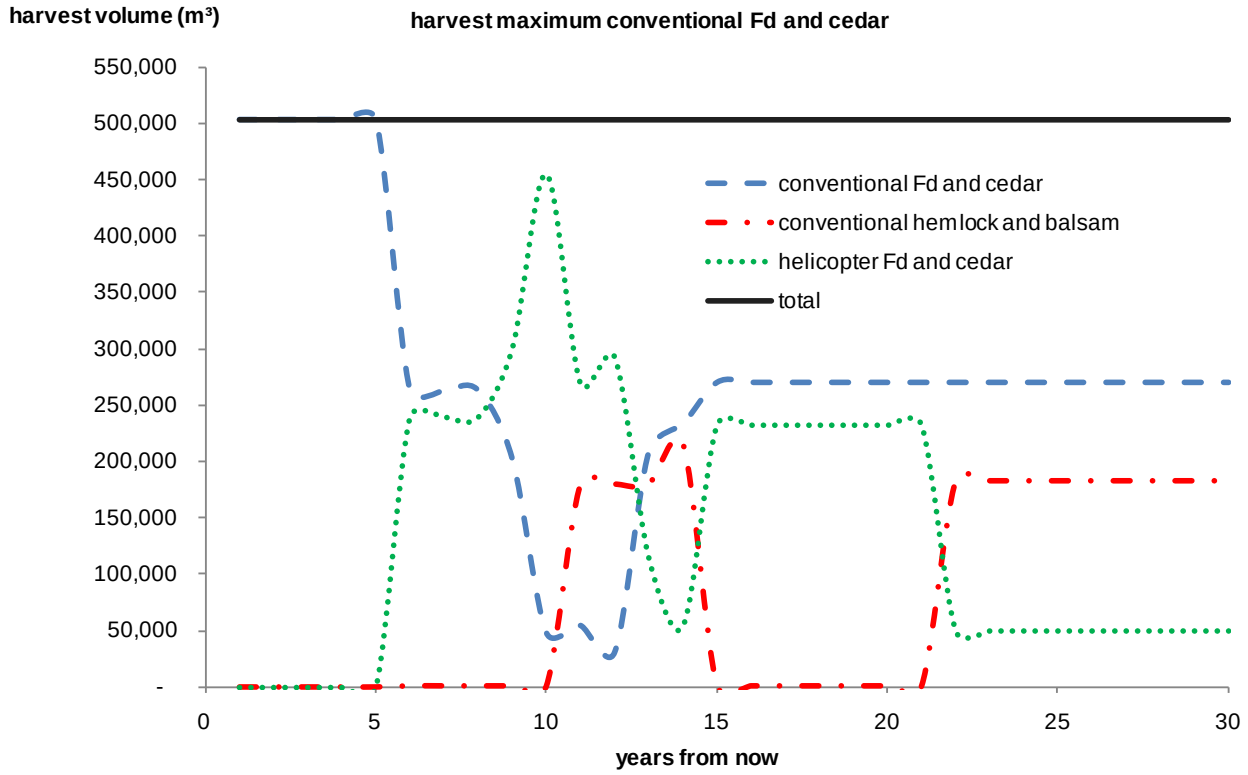

Figure 4. Harvest profile if initial harvesting is concentrated in conventional Douglas-fir-cedar stands.

Sensitivity analysis

The base case uses a specific set of available data and forest management assumptions that attempts to capture current forest composition and management. Sensitivity analysis is used to examine the effect on timber supply of uncertainty or known differences in the assumptions used in the base case.

The base case for this timber supply analysis projects that the current AAC can be maintained for 30 years before increasing to levels that are higher than in the base case prepared for the 2000 AAC determination, in spite of a 25 000 hectare reduction in the size of the timber harvesting land base. This stability in the base case harvest levels is primarily attributable to the use of new site productivity information for managed stands.

Numerous studies throughout British Columbia have indicated that stand growth estimates based on inventory information from old-growth stands underestimate the productivity of second-growth managed stands. For this timber supply analysis the productivity of second-growth managed stands has been adjusted for Douglas-fir and hemlock on the basis of new site productivity information for the Soo TSA.

In order to examine the effect on timber supply of uncertainty in the productivity of second-growth managed stands, the productivity of second-growth Douglas-fir stands was decreased by 20 percent. The results, summarized in Table 2, indicate that decreasing the productivity of second-growth Douglas-fir has no effect on the short-term timber supply and a minimal effect on the long-term timber supply; however, the mid-term timber supply is reduced by 17 percent.

Table 2. Select sensitivity analyses
Short = decades 1-2, Mid = decades 3-10, Long = decades 11-25

What	Change	Percent Impact		
		Short	Mid	Long
Post harvest site index adjustments for Douglas-fir and hemlock stands.	If volume not achieved in Douglas-fir stands. Reduce Fd managed stand volumes by 20%	–	Fd -17%	-1%

Socio-economic conditions

According to population estimates and projections provided by BC Stats, BC Ministry of Citizen's Services, between 2000 and 2010, the population of the Howe Sound Local Health Area (the closest geographic match to the Soo TSA) increased by 21 percent from 29 659 to 35 958. During the same period, population growth in the Central Okanagan Regional District, which was the highest in BC, was 24 percent. BC Stats projects that in the next decade the Squamish-Lillooet area will have the fastest growing population in BC.

In 2001, total employment in the Squamish Forest District was 23 822. At that time, tourism accounted for 38 percent, the public sector accounted for 32 percent, construction accounted for 10 percent and forestry accounted for 9 percent of total employment in the district. In 2006, total employment in the district had increased to 25 943, of which tourism accounted for 36 percent, public sector accounted for 31 percent, construction accounted for 14 percent and forestry accounted for 4 percent.

Using employment coefficients developed for the Soo TSA in 1999, each 10 000 cubic metres of AAC generated 5.9 logging and silviculture jobs and 7.6 wood processing jobs. While this coefficient is dated, it still provides an indication of the direct employment that may be supported by the timber harvested in the Soo TSA. These direct jobs are located both within and outside of the TSA. These employment numbers do not include jobs that are generated due to indirect or induced employment. There have been a number of mill closures in the area including one sawmill and one pulp mill, and this has resulted in both a decrease in direct employment and a dispersal of jobs as fibre from the TSA is processed at mills further from the TSA.

At present, about 60 to 70 percent of the logs harvested in the TSA are sold on the Vancouver log market, while the remaining 30 to 40 percent are sold in the USA, China, Korea, and Japan. A significant proportion of the timber harvested in the Soo TSA is processed in lower mainland and Vancouver Island. It is the combination of opportunities in the domestic and international log markets that create viable operating conditions for a licensee base that has evolved over the last several decades to be largely market based.

Summary

The base case harvest forecast indicates that an initial harvest at the level of 503 000 cubic metres can be maintained for 30 years before increasing to 625 000 cubic metres. This level then gradually increases over a period of 100 years. However, this forecast is based on the assumption that harvesting occurs in the Douglas-fir- cedar stands harvested both conventionally and by helicopter and conventionally harvested hemlock-balsam stands.

In an alternative harvest forecast in which harvesting only occurred in conventional Douglas-fir-cedar stands, a harvest level of 503 000 cubic metres per year (the current AAC) could only be maintained for five years before decreasing to 239 000 cubic metres per year.

These results suggest that if the conventional hemlock- and balsam-leading and heli-Douglas-fir and cedar-leading stands are harvested in proportion to their contribution to the species profile of the timber harvesting land base, the timber supply in the Soo TSA remains robust.

The provincial chief forester's AAC determination is a judgement based on his professional experience and his consideration of a wide range of information as required under Section 8 of the *Forest Act*. An AAC is neither the result of a calculation nor limited to the results of timber supply analysis; therefore, the new AAC may not be the same as any of the initial harvest levels depicted in any of the forecasts included in this document.

Your input is needed

Public input is a vital part of establishing the allowable annual cut. Feedback is welcomed on any aspect of this public discussion paper or any other issues related to the timber supply review for the Soo timber supply area. Ministry staff would be pleased to answer questions to help you prepare your response. Please send your comments to the forest district operations manager at the address below (via email if possible).

Your comments will be accepted until January 14, 2011.

You are reminded that responses will be subject to the *Freedom of Information and Protection of Privacy Act* and may be made public. If the responses are made public, personal identifiers will be removed before the responses are released.

For more information or to send your comments, contact:

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Further information regarding the technical details of the timber supply analysis is available on request by contacting Forests.ForestAnalysisBranchOffice@gov.bc.ca

Visit the Forest Analysis and Inventory Branch web site at http://www.for.gov.bc.ca/hts/