

Postponement of Allowable Annual Cut
Forest Act, Section 8 (3.1)

Draft Technical Summary

TSA 31

Soo Timber Supply Area

January 2023

CONFIDENTIAL

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Introduction

This document provides information to assist the chief forester in making a *Forest Act* Section 8 (3.1) decision regarding postponing a *Forest Act* Section 8 allowable annual cut (AAC) determination for the Soo Timber Supply Area (TSA).

The deputy chief forester's choice to consider a postponement rather than an AAC determination was based on a preliminary assessment conducted by Forest Analysis and Inventory (FAIB) staff. The initial results indicate that the AAC is not likely to change with a new determination.

In this document, factors that might affect a new AAC determination are examined in more detail.

Forest Act – Postponements

Section 8 (1) of the *Forest Act* requires the chief forester to determine an AAC at least once every 10 years after the date of the last determination for the Crown land within a TSA excluding area-based licences. Section 8 (3.1) (a) of the *Forest Act* permits the chief forester to postpone the next determination by written order if the current AAC is not likely to be changed significantly with a new determination. Section 8 (3.2) permits the chief forester to rescind the order made under 8 (3.1) and set an earlier date for the next determination, however a written reason for the earlier date must be given.

Description of the Soo TSA

The Soo TSA is located on the south coast of British Columbia (BC), north of the City of Vancouver. It lies within the South Coast Natural Resource Region and is administered by the Sea to Sky Natural Resource District located in Squamish. It is bounded on the west by Tree Farm Licence 38 and the Sunshine Coast TSA, on the north by the Lillooet TSA, and on the south and east by the Fraser TSA. The communities of Lions Bay, Squamish, Whistler, and Pemberton are located within the TSA. First Nations communities in the Soo TSA are located in Squamish, Whistler, Mount Currie, D'Arcy, Skatin, Baptiste Smith and Tipella.

There is high demand for recreation opportunities in this area, given that there is a population of approximately 2.1 million residents within one hour's drive of the Sea to Sky Natural Resource District. There are 20 parks and nine conservancies within the Soo TSA.

In 2011 the total TSA was 909 519 hectares. The analysis forest land base (AFLB)¹, previously known as the managed forest land base, was 266 646 hectares, or 29 percent of the TSA. The timber harvesting land base (THLB)² was 93 152 hectares or 10 percent of the TSA.

¹ Analysis forest land base (AFLB)

The analysis forest land base is the forested area of the TSA that is managed for a variety of natural resource values at the provincial level. It excludes non-forested areas (e.g., water, rock, and ice), non-productive forest (e.g., alpine areas, areas with very low productivity), and non-commercial forest. For the purpose of an AAC determination under Section 8 of the Forest Act, the AFLB also excludes area-based tenures such as woodlots. Parks contribute to the accounting for biodiversity targets and are therefore included in the AFLB.

² Timber harvesting land base (THLB)

The portion of the analysis forest land base that is managed for timber supply and is an estimate of the land where timber harvesting is considered both acceptable and economically feasible, given the objectives for all relevant forest values, existing timber quality, market values and applicable technology. The THLB is derived from the data, forest management practices and assumptions described in the data package. It is a theoretical, strategic-level estimate used for timber supply analysis and could include areas that may never be harvested or may exclude areas that will be harvested.

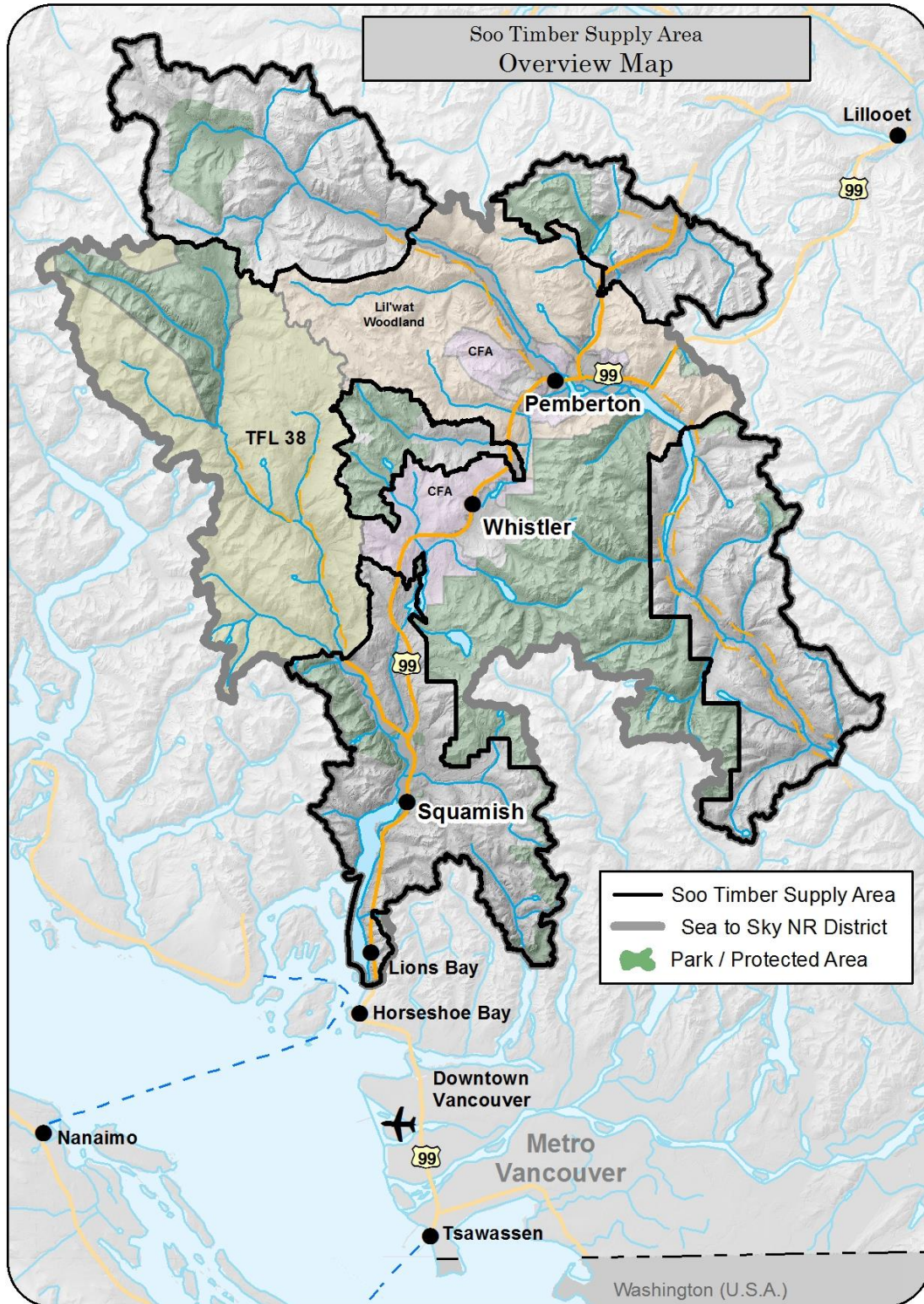


Figure 1. Overview map of the Soo TSA.

First Nations Overlap with the Soo TSA

The following First Nations are the primary Nations whose Traditional Territory overlaps with the Soo TSA administrative boundary.

- Lil'wat Nation
- N'Quatqua
- Samahquam
- Skatin Nation
- Squamish Nation
- Tsleil-Waututh Nation
- Xa'xtsa First Nation

The following First Nations Traditional Territories have periphery overlaps with the Soo TSA.

- Boston Bar First Nation
- Kwantlen First Nation
- Matsqui First Nation
- Musqueam Indian Band
- Nlaka'pamux Nation Tribal Council
- Seabird Island Band
- Shishalh First Nation
- Stó:lō Nation Tribal Council
- Sts'ailes First Nation
- T'tit'q'et First Nation

Each First Nation will be sent a consultation letter and a link to the *Postponement Technical Summary* document.

Historical and Current AAC

Table 1 displays the AAC determination history of the Soo TSA.

Table 1. History of AAC Determinations for the Soo TSA

Year	AAC (m ³ /year)	THLB (hectares)	Description
1980	669,635	-	-
1982	700,000	170,000	TSA boundary adjustment.
1989	705,000	-	Inclusion of deciduous volume through temporary licence.
1992	580,000	134,418	-
1996	506,000	109,765	96,599 cubic metres allocated to Small Business Forest Enterprise Program (SBFEP), now BC Timber Sales (BCTS).
2000	503,000	123,392	Excluded new woodlots. 90,000 cubic metres helicopter partition. The helicopter land base increased to 26,450 hectares from 1468 hectares.
2011	480,000	93,152	25% decrease in the THLB primarily due to the implementation of the Sea-to-Sky LRMP in April 2008, including the establishment of new parks, conservancies, and land use zones; construction of the Whistler Olympic Park, sliding centre facilities, and athletes' village; First Nations accommodation measures associated with the 2010 Winter Olympic Games; establishment of five new woodlots and the Cheakamus Community Forest; and implementation of Government Actions Regulation (GAR) orders protecting critical habitat for deer, moose, mountain goats, grizzly bears, and marbled murrelet. Spatial modelling of landscape-level biodiversity requirements, riparian areas, known archaeological and cultural use areas, roads, and northern spotted owl special resource management zones. The finalization and full implementation of the resource management plans for the northern spotted owl. The 90,000 cubic metre helicopter partition was removed.
2020	467,473	90,721	Spelkúmtn Community Forest (12 527 m ³ /year, 2431 hectares) removed from the 2011 AAC.
2021	391,118	75,903	Lil'wat First Nation woodland licence (76 355 m ³ /year, 14 818 hectares) removed from the 2020 AAC.
2022	368,276	71,468	Squamish Community Forest (22 842 m ³ /year, 4435 hectares) issued on December 22, 2022.

The most recent AAC determination, effective May 12, 2011, set the AAC at 480 000 cubic metres. Since then, land base exclusions for Spelkúmtn Community Forest, Lil'wat First Nation woodland licence, and Squamish Community Forest resulted in an effective AAC of 368 276 cubic metres.

Timber Supply Review (TSR 3)

The most recent TSR, completed in 2011, is referred to as TSR 3 in this document.

Base Case

The base case harvest projection that supported the May 12, 2011, AAC determination had an initial harvest of 503 000 cubic metres per year for 60 years which increased to a long-term harvest level of 612 000 cubic metres per year (Figure 2). Three combinations of harvest system and tree species groups contributed to the base case: conventional Douglas-fir and cedar (42 721 hectares of THLB), conventional hemlock and balsam (34 155 hectares of THLB), and helicopter Douglas-fir and cedar (10 743 hectares of THLB).

The modelled harvesting priority rules included use of the "highest volume first" rule, ensuring all forest cover constraints were met at all times, and prioritizing stands in the following order: 1) stands with Douglas-fir, western redcedar, or yellow-cedar as the leading species (Fd/C leading stands) that are harvestable using conventional methods, including cable harvesting and ground-based techniques; 2) stands with Douglas-fir, western redcedar, or yellow-cedar as the leading species that are harvestable using a helicopter; and 3) stands with hemlock or amabilis fir as the leading species (H/Ba leading stands) that are harvestable using conventional methods.

The base case objectives were to: 1) maintain the current AAC for as long as possible; 2) not reduce the mid-term harvest level below the sustainable long-term harvest level; 3) if necessary, reduce the harvest level at a maximum rate of 10 percent per decade; 4) minimize the length of any period in which the harvest level fell below the sustainable long-term level; and 5) reach a stable long-term harvest level associated with a stable total merchantable inventory within the area in the TSA that is available for timber harvesting, which is referred to as the —timber harvesting land base|| (THLB).

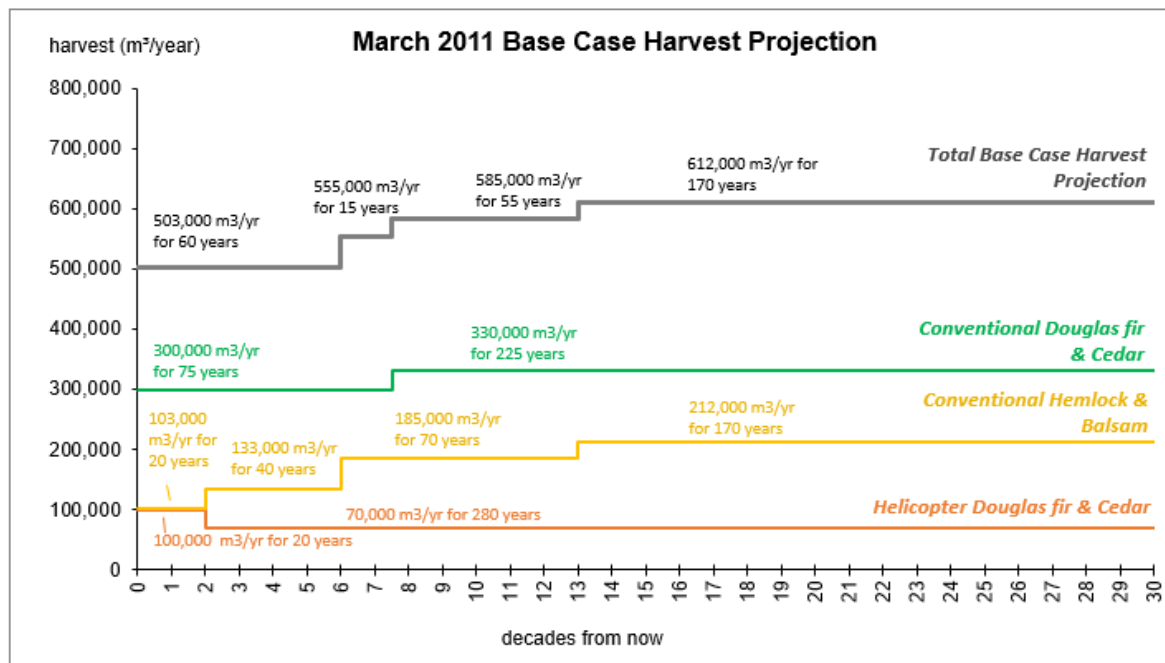


Figure 2. TSR 3 base case harvest forecast.

Growing Stock

In the TSR 3 base case the merchantable growing stock began at just over 20 million cubic metres. The growing stock increased substantially over the mid- to long-term due to site index adjustments being applied to managed to Douglas-fir and hemlock stands. In Figure 3 “Heli-Hw_BA-P” label, indicates the harvest system and species grouping of helicopter poor site hemlock and balsam.

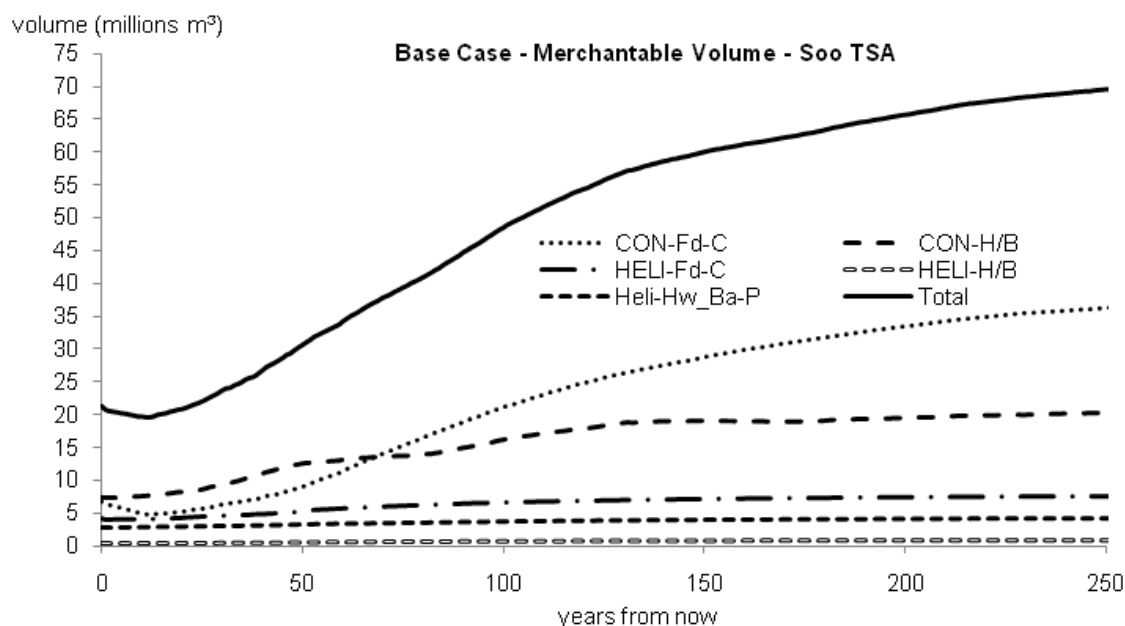


Figure 3. Growing stock projection for the Soo TSA from the TSR 3 base case.

A growing stock comparison was completed using three different inventory years, 2007, 2011, and 2021 (Figure 4). The inventory used for TSR 3 was updated in 2001 to the VRI format and projected to 2007 using VDYP. A new inventory was completed in 2011 after the TSR 3 analysis was complete. Using the TSR 3 THLB, a growing stock evaluation was completed summarizing the volumes at 17.5 cm utilization. The total growing stock volumes were comparable over the three inventory years, 24.0 million cubic metres (2007), 22.0 million cubic metres (2011), and 24.6 million cubic metres (2021). Differences between growing stock volumes for the 40 to 60 year age class are attributable to the projected growth (increase in stand volume) that occurred between successive inventories for the period 2007 to 2021. The review of the recent inventory data suggests that the growing stock is stable within the Soo TSA. Even at the lowest point in the projection there is 20 million cubic metres of growing stock that would support 54 years of harvest at the current AAC.

Table 2. Growing stock volume by age class summarized at 17.5 cm utilization for three inventory years.

Age class	2007 Inventory	2011 Inventory	2021 Inventory
1 to 20	1,698	5,287	8,185
20 to 40	1,083,314	1,457,342	1,057,145
40 to 60	1,762,287	2,839,641	4,956,625
60 to 80	1,180,842	1,372,628	2,398,167
80 to 100	1,437,677	972,924	1,107,689
100 to 120	1,295,270	916,251	1,042,475
120 to 140	1,691,678	973,694	962,085
140 to 250	5,716,129	4,513,588	4,431,008
250+	9,857,395	8,998,897	8,638,543
Grand Total	24,026,291	22,050,252	24,601,922

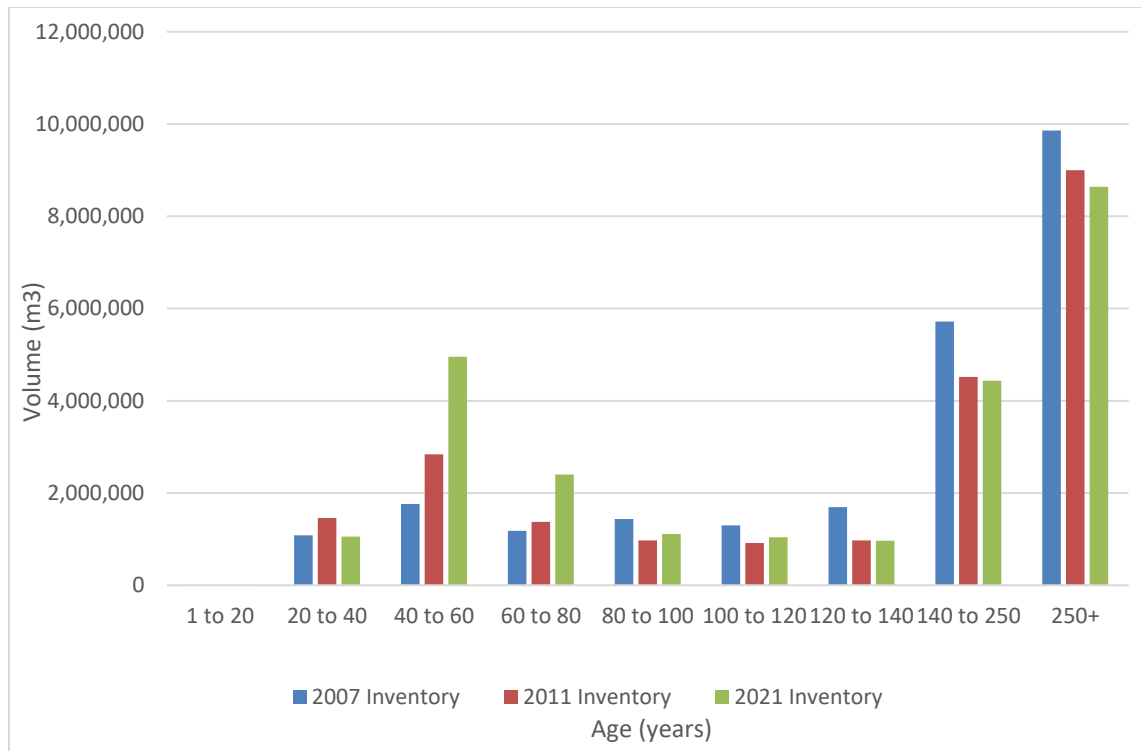


Figure 4. Growing stock volume by age class summarized at 17.5 cm utilization for three inventory years.

Timber Harvesting Land Base

Table 3 is the netdown table from the TSR 3 determination binder. The netdown is not subtractive unlike recent TSR processes and was not redone as part of this postponement. The 2011 gross area of the TSA was 909 519 hectares, the 2011 analysis forest land base of 266 646 hectares, and the 2011 timber harvesting land base of 93 152 hectares. There have been numerous minor THLB reductions since TSR 3 and three significant tenure allocations. The THLB reductions are discussed throughout the document and summarized in appendix 1 in Tables 17-19.

Table 3. Description of the Soo TSA productive forest land base

Description of netdown	Sequential area reduction (net area)	Productive forest %	Gross area (ha)
Parks	14,621	5.5%	14,621
East Howe Sound-Inaccessible	1,894	0.7%	1,894
LRMP Wildland Zones	16,343	6.1%	16,343
Squamish Cultural Areas	1,223	0.5%	1,380
Lil'wat Cultural Areas	2,945	1.1%	2,993
LN Spirited Ground Areas (A and C)	-	0.0%	443
Callaghan & Cheakamus CMAs	184	0.1%	184
In-SHUCK-ch Mountain (exclusion)	191	0.1%	642
OGMA's	19,170	7.2%	24,905
Archaeological Sites	258	0.1%	323
Inoperable Class N	894	0.3%	14,948
Inoperable Class I	60,723	22.8%	85,952
UWR Retention-Goat	1,377	0.5%	10,891
UWR Retention-Deer	3,278	1.2%	10,997
UWR Retention-Moose	123	0.0%	381
Grizzly Bear WHA	1,893	0.7%	3,486
Marbled Murrelet WHA	136	0.1%	1,349
Owl Long Term Habitat	11,911	4.5%	37,519
ESA1 (100% Reduction) No ESA2's	6,798	2.5%	60,496
Non-Commercial Species e.g. Larch	6,959	2.6%	16,889
Conventional - Unmerchantable	13,399	5.0%	29,365
Helicopter – Unmerchantable	1,831	0.7%	3,387
Non-Forest Partial Reduction e.g., Roads	2,445	0.9%	2,445
Riparian and WTP/WTR Reductions	4,898	1.8%	4,898
Timber Harvesting Land Base	93,152	34.9%	

Forest Composition

Age Class Distribution

The THLB by 20-year age classes was compared over three different inventory years, 2007, 2011, and 2021. Each inventory year represents a snapshot in time, i.e., the 2007 inventory reflects the age of the forest in 2007. The 40-60 and 60-80 year age classes increase substantially in the 2021 inventory as harvested stands have aged since the 2007 and 2011 inventories were conducted.

Table 4. Comparison of THLB area by age class using three inventories

Age class	2007 inventory	2011 inventory	2021 inventory
1 to 20	9,663	7,881	5,558
20 to 40	22,318	21,653	16,172
40 to 60	6,905	10,424	17,583
60 to 80	2,712	3,264	5,021
80 to 100	3,084	2,360	2,260
100 to 120	2,630	2,136	2,280
120 to 140	3,181	2,102	2,060
140 to 250	9,476	8,910	8,418
250+	13,514	14,603	14,232
Grand Total	75,274	75,274	75,274

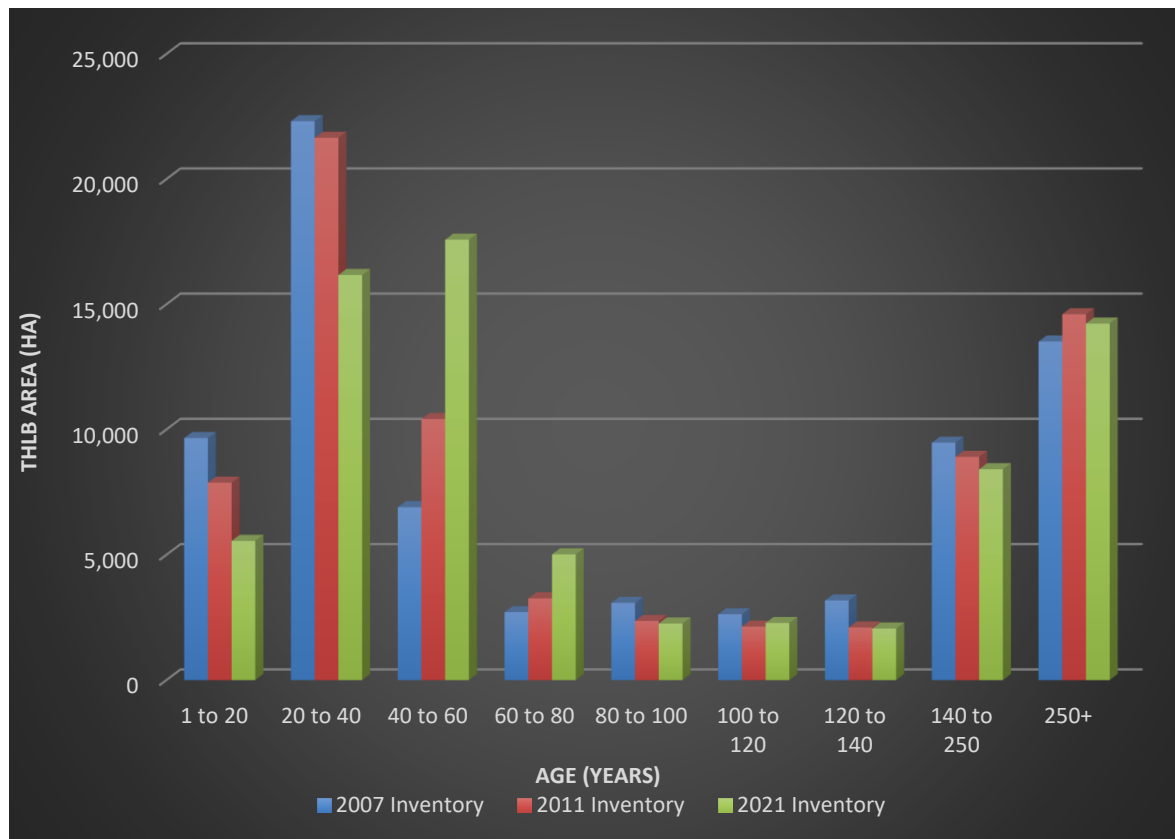


Figure 5. Comparison of THLB area by age class using three inventories.

Mature Inventory Audit

Often a comparison of total stand age, stand height, and net merchantable volume between ground sample data collected by the Forest Analysis and Inventory Branch (FAIB) and the Phase I VRI is made to verify the accuracy of the Phase 1 VRI. The sample data comes from Phase II VRI plots, the Change Monitoring Inventory (CMI) program, and the National Forest Inventory (NFI) program.

CMI samples are established across the province on the NFI grid (20km*20km) in the mature population, greater than 50 years old. Seven CMI ground plots were established between 2019 and 2020 within the Soo TSA, which is not a statistically significant sample size to conduct a comparison.

Young Stand Monitoring

A Young Stand Monitoring (YSM) program has been established across several management units in BC, including the Soo TSA. The target population for the TSA monitoring program includes Crown forested stands defined by the VRI as being between 15 and 50 years old. Key YSM objectives are to describe the characteristics and structure of young stands, report on forest health, assess the accuracy of predicted attributes, and compare against growth models to help evaluate if young stands will meet future timber supply expectations.

YSM samples are established across the province on an intensification of the NFI grid (generally 5km*10km). In the Soo TSA, six plots were sampled between 2019-2020, but the sample size is not statistically significant for comparison. The Inventory Section of FAIB plans to run a separate analysis grouping ground sample data by BEC-subzones rather than by administrative boundaries. This information can be incorporated into a future TSR process. Ministry staff recommend that in the future, additional YSM plots be established and incorporated into future TSRs to monitor the harvest profile of the younger age classes.

Site Productivity

In TSR 3, managed stand site productivity was estimated using adjusted VRI site index for Douglas-fir and western hemlock stands, and unadjusted site index values for other species. The adjustment factors were from a site index adjustment project completed in 2008. On average, the Douglas-fir site index values were increased by 37 percent and hemlock by 45 percent.

In the TSR 3 *Rationale for AAC Determination* document the chief forester provided the following Implementation Instruction: *"I encourage the licensees and FLNR staff to use the results of the planned Vegetation Resources Inventory and Terrestrial Ecosystem Mapping (TEM) projects to verify or revise the site index estimates and carefully assess their impacts on the projected mid-term and long-term timber supply in the next analysis"*.

TEM projects have been completed for most of the Soo TSA, and the current Provincial Site Productivity Layer uses this data for site index approximations. For the next TSR, the provincial site productivity layer (PSPL) will be used. Field work started in September 2022, with data anticipated to be available in the fall of 2023. An AAC determination made today would utilize the same site productivity information as TSR 3.

Harvest History

This section compares the TSR 3 base case assumptions to the harvest performance since 2011.

Harvest Performance

According to Harvest Billing System (HBS) data, only 75 percent of the AAC was harvested over the period of 2011-2021. Harvest pressure has been lower than anticipated with additional growing stock available, indicating that the AAC should be sustainable.

Table 5. Harvest performance from 2011 to 2021 within the Soo TSA

Year	Harvest (m ³)	AAC	% AAC harvested
2011	250,895	480,000	52%
2012	278,646	480,000	58%
2013	301,612	480,000	63%
2014	323,392	480,000	67%
2015	320,920	480,000	67%
2016	455,763	480,000	95%
2017	369,402	480,000	77%
2018	361,266	480,000	75%
2019	447,273	480,000	93%
2020	397,510	467,473	85%
2021	361,504	391,118	92%
Total	3,868,183	5,178,591	75%

Accumulated and Uncommitted Volume

The Ministry of Forests Tenures Branch and BC Timber Sales provided information on accumulated volume within the Soo TSA for the period of 2011 to December 31, 2021. The 2022 data will not be available until April of 2023. This factor is for information only as Tenures Branch indicated that there are no disposition agreements in place for any of the volume at this point in time.

Table 6. Accumulated and uncommitted volume for the Soo TSA from 2011 to December 31, 2021

Type	Volume (m ³)
Non-First Nation Accrued Unlicensed Volume	155,647
First Nation Accrued Unlicensed Volume	423,790
Major Licence Unharvested Volume	424,814
BC Timber Sales Unused Volume	140,000
Total	1,144,251

Harvest Species Composition

The TSR 3 base case is predicated on the assumption that, in addition to the conventional Douglas-fir/ western redcedar (Fd/Cw) stands, harvesting will also need to occur in both the conventional hemlock/ balsam (HemBal) stands, and the helicopter accessed Douglas-fir/cedar (Fd/Cw) stands. In the 2011-2019 period, the average scaled volume (from HBS) has been reasonably representative of the timber harvest profile. An average of 56 percent Fd/Cw has been harvested *versus* the THLB inventory of 57 percent. The average harvest of HemBal was 41 percent, which is consistent with the species profile of the THLB. Given that the licensee's are not overharvesting a particular species profile, the modelling assumptions in TSR 3 have been consistent with timber harvesting from 2011 to 2019.

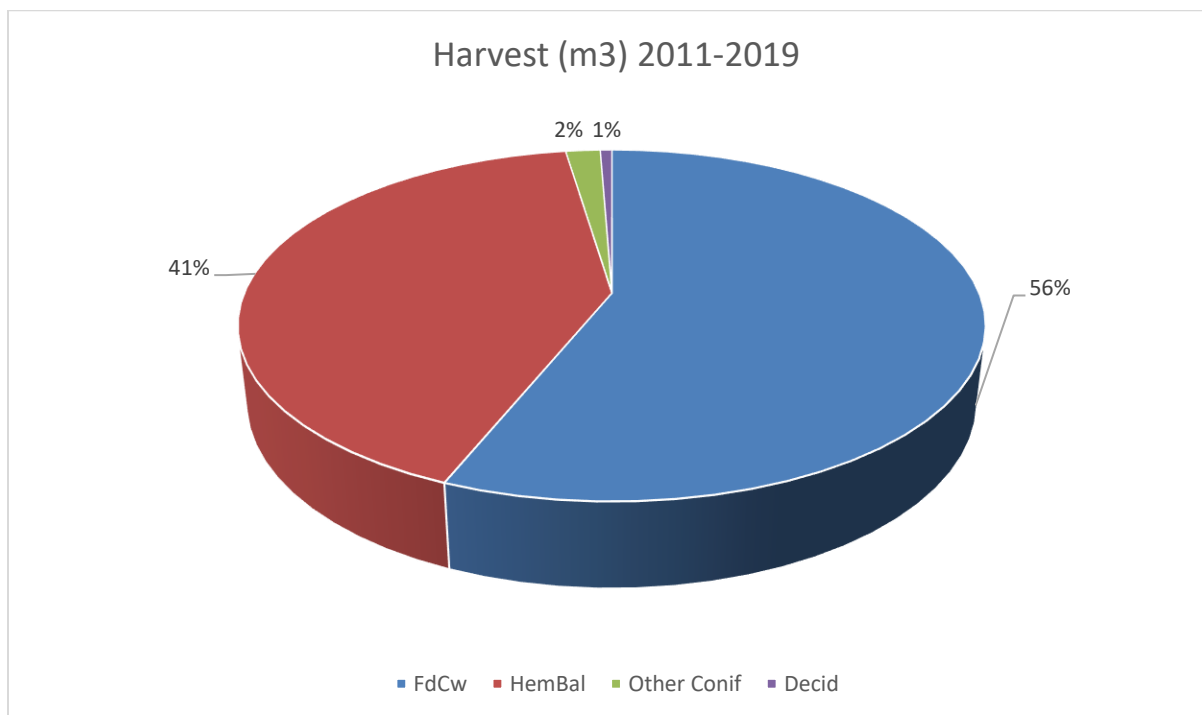


Figure 6. Timber harvest profile by species group from 2011 to 2019.

Helicopter Logging Performance

Blocks that were harvested using the helicopter harvest method, as specified in the E-Commerce Appraisal System (ECAS) between 2012-2020 average eight percent of total harvest. It is difficult to compare this directly to the stands labelled as “heli-log” in the inventory, as a spatial comparison has not been completed. It does likely however indicate under-performance in helicopter logging between TSR 3 and the present date, as 19.9 percent of the volume in the TSR 3 base case comes from the harvest system and tree species grouping of helicopter Douglas-fir/cedar. Harvesting the helicopter land base proportionately to the other harvest system and tree species groupings continues to be important and should be explored further in the next TSR.

Harvestable Age

A summary of timber harvesting by age class in FTA cutblocks (5-year harvested blocks, 2017-2021) and VRI polygons was used to produce Figure 7 (a modified version of the *Soo TSA Provincial Timber Objectives Management Units Target Report 2022*). The VRI profile from age 40-60 years was added to the timber objectives report to assist with the comparison.

In TSR 3 the criteria used to define minimum harvestable age was a specified volume based on harvesting method. A volume criterion of 350 cubic metres per hectare was used for conventional stands and 400 cubic metres per hectare for helicopter stands.

Table 7. Minimum harvestable age criteria used in TSR 3

Analysis unit	Managed stand MHA (years)	Volume criteria	Volume criteria
	Conventional	Conventional land base	Helicopter land base
Fir - good	46	350	400
Fir - medium	70	350	400
Fir - poor	100	350	400
Cedar/spruce- good/medium	51	350	400
Cedar/spruce- poor	76	350	400
Hemlock/balsam - good	51	350	400
Hemlock/balsam - medium	68	350	400
Hemlock/balsam - poor	91	350	400

Although 26 percent of harvested blocks are within the 40-60-year age class, the harvested stands still meet the TSR 3 minimum harvestable criteria. A sensitivity analysis in TSR raised the minimum harvestable volume criteria to 650 cubic metres per hectare and the base case harvest rate was able to be maintained. It is recommended that a sensitivity analysis is completed during the next TSR, examining the impacts of raising the minimum harvest age.

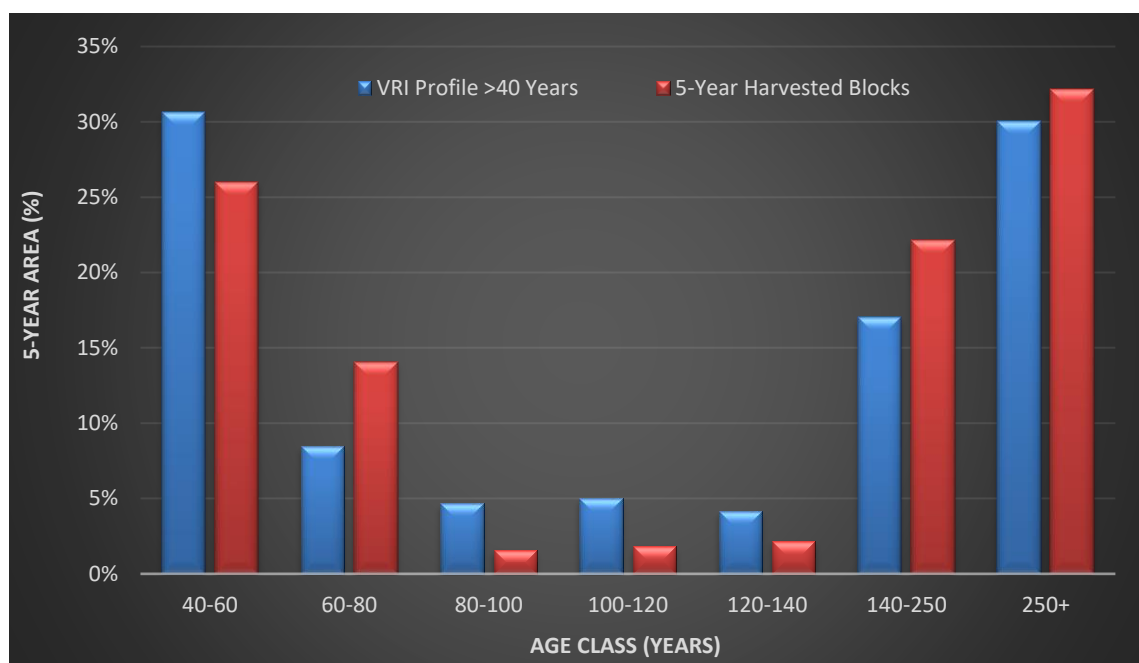


Figure 7. Summary by age class for timber harvesting conducted from 2017-2021 compared with the VRI inventory.

Utilization Standards

The utilization level defines the maximum stump height, minimum top diameter (inside bark), and the minimum diameter at breast height that must be removed from harvested areas. These factors are needed to calculate merchantable stand volume for use in the analysis. The standards specified for the analysis reflect current operational practice (consistent with the *Provincial Logging Residue and Waste Measurements Procedure Manual*).

For yield table projections in the timber supply analysis (TSR 3), the specifications for minimum stump diameter are converted to a corresponding breast height diameter. The minimum top diameter inside bark was modelled as 10 cm not 15 cm for non-pine species > 121 years old due to the growth and yield models' limitations. The Forest Analysis team lead calculated the difference in volume. For both an average western hemlock tree and a Douglas-fir tree, the difference is about three percent.

It is likely that due to the use of the older model there will be a small unquantified downward pressure on the AAC.

Table 8. Utilization levels within the Soo TSA

Leading species	Minimum dbh (cm)	Maximum stump height (cm)	Minimum top dib (cm)
Pine	12.5	30	10
All others – < 121 years	12.5	30	10
All others > 121 years	17.5	30	15

Silvicultural Systems

In TSR 3, the uncertainty about potential limitations on regeneration and stand yields due to shading from overstorey trees was identified as a concern. Silviculture systems that retain overstorey trees are being utilized to accommodate other resource values such as maintaining wildlife habitat and stand-level biodiversity, future coarse woody debris contribution, maintaining structural diversity, and for achieving visual quality objectives. It was also identified in TSR 3 that during helicopter logging significant amounts of economically unviable timber (i.e., hemlock) are sometimes being left as standing timber.

In the TSR 3 *Rationale for AAC Determination* document the chief forester provided the following implementation instruction: *“Because of uncertainty about potential limitations on regeneration and stand yields due to shading from overstorey trees such as reserves, retention, and uneconomical timber, I request the district and FAIB staff to collaborate in examining further the growth performance of young stands in the Soo TSA. This includes investigating relevant research results, the extent to which they have been incorporated in the models used in the analysis, and operational results from the field”.*

Since TSR 3, some research has been completed in nearby TSAs (Sunshine Coast, for example), and yield projections have been modelled in Tree and Stand Simulator (TASS). TASS 3 is in development and will allow for the modelling of stand dynamics, including shading in high retention stands. Additional work is being planned in the Soo TSA to assess the status of previously harvested high retention blocks. Although there has been some research investigating the effects of shading on tree growth, to date none has clearly shown the impact on timber supply.

Various types of partial cutting, with inherent shading, comprised 17 percent of the area harvested as of 2019. Other sources of shade, such as reserves and uneconomical timber, have not been quantified, nor has the impact of shading been determined. A lack of local data prevented the chief forester from estimating the potential effect of overstorey shading on understory growth, and the concern that this may result in a downward pressure on mid- to long-term timber supply remains.

Table 9. Summary of silviculture systems and shade related concerns

Silviculture system	Shade-related concern (ha)		Total
	No	Yes	
Clearcut	76,489		76,489
Clearcut with reserves		6,137	6,137
Intermediate cut		114	114
Partial cut		2,820	2,820
Patch cut		48	48
Retention		5,667	5,667
Seed tree		332	332
Shelterwood		1,068	1,068
Total	76,489	16,186	92,675
Percentage	83%	17%	100%

Operability

Slope

A summary of the average slope at a one-hectare scale in FTA cutblocks (5-year harvested blocks, 2017-2021) and VRI polygons greater than 60 years of age was used to produce Figure 8 (from the *Soo TSA Provincial Timber Objectives Management Units Target Report 2022*). Timber harvesting is being focused on a higher proportion of slopes between 0-50 percent and avoiding slopes 51 percent and greater compared with the VRI profile.

It is unknown what impact this might have on the harvest flow, but it suggests that the operability assumptions should be re-examined during the next TSR.

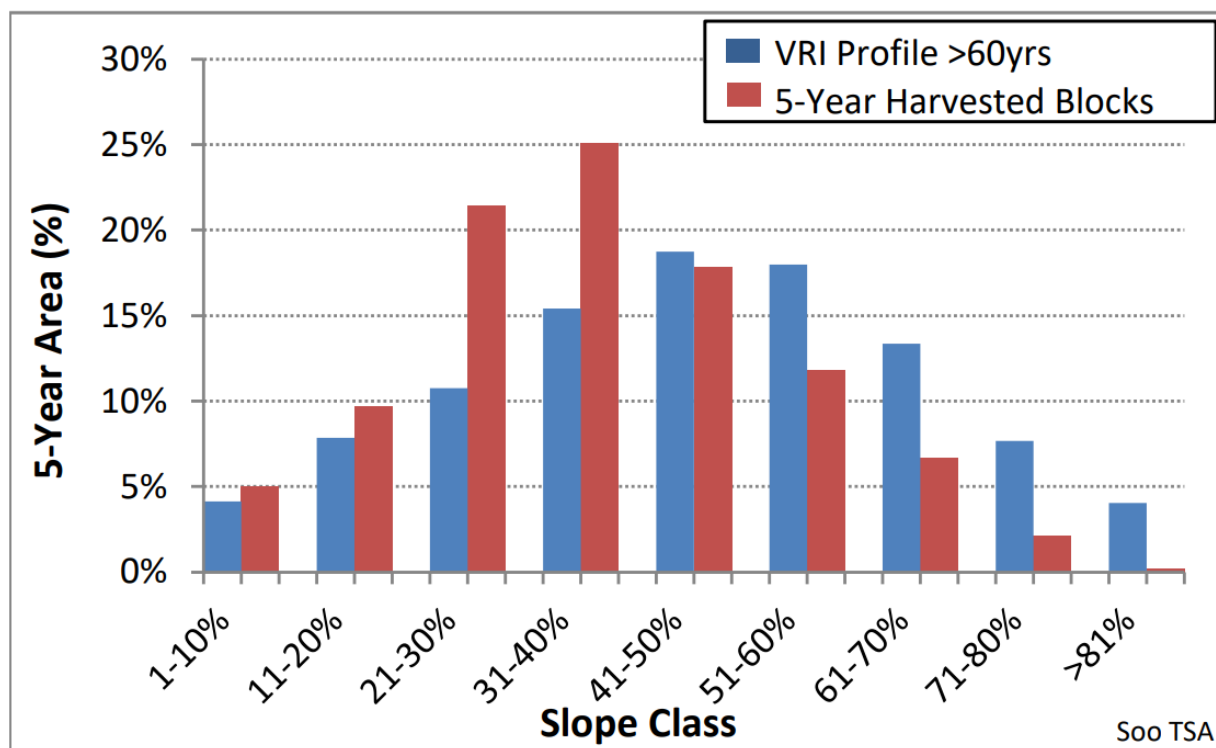


Figure 8. Summary of slopes that timber harvesting was conducted on from 2017-2021 versus the VRI inventory.

Integrated Resource Management

Visual Quality Objectives

Minor changes to Visual Quality Objectives (VQOs) have occurred since TSR 3, with approximately 200 hectares of THLB that has new and revised VQOs in the Shannon Basin area. The associated impact to timber supply is minimal, and these VQO areas are within the recently issued Squamish Community Forest Agreement (CFA). The Squamish CFA will be removed from the Soo TSA THLB and accounted for under the AAC Administration Regulation. CFAs are discussed in the “changes to the land base” section below.

Landscape Level Biodiversity

Draft OGMAs were used in TSR 3. In the TSR 3 *Rationale for AAC Determination* document the chief forester provided the following implementation instruction, “*I request the district staff to work with forest licensees to refine the old growth management areas currently designated in the Soo TSA, moving them into otherwise constrained areas wherever appropriate*”.

Some landscape units refined the historical draft OGMAs, while others required entirely new OGMAs. Several OGMAs were moved or located into areas that were constrained by other values. All landscape units in the Soo TSA now have legally established spatial OGMAs and there is no impact on the AAC.

Old Growth Deferrals

On April 30, 2020, an independent panel appointed by the BC Government submitted their report *A New Future for Old Forests: A Strategic Review of How British Columbia Manages for Old Forests Within its Ancient Ecosystems*. Currently, the BC Government is engaging with First Nations across the Province about how recommendations from the report will be implemented within the context of a Provincial Old Growth Strategy. Recommendation 6 in the report recommends to “defer development in old forests where ecosystems are at a very high risk of irreversible biodiversity loss”. To help identify these priority at-risk old forests the BC Government consulted an independent Old Growth Technical Advisory Panel (TAP).

FAIB staff have evaluated the resulting Priority Deferral Areas map created by the TAP and have determined that there are approximately 16 615 hectares of THLB considered by the TAP to be priority at-risk old forest within the Soo TSA. Of the 16 615 hectares, 385 hectares overlap with the Spelkúmtn Community Forest Agreement and 2275 hectares overlap with the Lil’wat First Nations woodland licence. Both tenures have been removed from the Soo TSA and are discussed in the “changes to the land base” section of this document. This reduces the amount of THLB overlapped by TAP within the Soo TSA to 13 955 hectares (19.5 percent of the total THLB).

The confirmation of First Nations supported TAP deferral areas are yet to be finalized however, the impact is expected to be far less than the 13 955 hectares of TAP overlapping the Soo TSA. It is estimated that approximately 3.9 percent of THLB growing stock falls within First Nations supported deferrals that overlap old growth in the TAP and non-TAP areas.

The supported old growth deferrals are comprised of areas either within the TAP priority at-risk old forest or within First Nation proposed deferral areas. Any changes to the protected status of these areas as a result of the work of the TAP will be accounted for in subsequent timber supply reviews for the Soo TSA, or the AAC may be adjusted in the interim by *Chief Forester’s Order*.

Wildlife Management Areas

The 753 hectare Pemberton Wetlands Wildlife Management Area (WMA) was established in 2011 and was not accounted for in TSR 3. Its purpose is to manage critical marsh habitat for waterfowl, fish, and Ungulate Winter Range (UWR). The WMA is mostly non-THLB, with the THLB impact estimated at approximately 57 hectares (0.08 percent of the total THLB).

Ungulate Winter Range

Two UWRs were approved prior to TSR 3, one for mountain goats (U-2-002), and one for moose and black-tail deer (U-2-005). Timber harvesting is not permitted in the Mountain goat UWR. For the black-tailed deer UWR, harvesting is not allowed within retention management units but is allowed in rotation management units, as modified harvesting is permitted. In 2014, about 342 hectares of UWR black-tailed deer winter range areas were amended from retention to rotation management and vice-versa. The net changes were balanced, so the AAC impact is negligible.

Wildlife Habitat Areas

Spotted Owl

TSR 3 accounted for Northern Spotted Owl (*Strix occidentalis caurina*) habitat by modelling the 1997 Spotted Owl Management Plan (SOMP), resulting in the removal of 11 911 hectares of THLB. In the TSR 3 *Rationale for AAC Determination* document the chief forester provided the following implementation instruction: “*Because the provisions for the spotted owl in the Soo TSA affect so much habitat and constrain the harvesting flexibility available to licensees over such a large area, I strongly encourage the agencies to complete the new habitat plan as soon as possible, to provide more operational flexibility to the Soo licensees*”.

Since TSR 3, Spotted Owl Wildlife Habitat Areas (WHAs) have been established, both for Long Term Owl Habitat (no harvest) and Managed Future Owl Habitat (reduced harvest). Spotted Owl was accounted for in TSR 3, based on the Special Resource Management Zones (SRMZ) areas which became the WHAs. The WHAs were established to meet the objective of “no net loss” (relative to the 1997 SOMP) for both THLB and Spotted Owl habitat. Given the no net loss policy, impact to the AAC is negligible.

Northern Goshawk

Establishment of Northern Goshawk (*Accipiter gentilis laingi*) WHAs is in progress within the Soo TSA. Five WHAs were approved and came into effect on October 13, 2022, within the Sea to Sky Natural Resource District, with 13 WHAs approved in total for the South Coast Natural Resource Region. The 13 WHAs contain all the viable breeding areas within the three Resource Districts that could be effectively protected at this time, with the addition of further WHA areas still in discussion.

Table 10. List of approved Northern Goshawk WHAs

Resource District			WHA Tag			
Chilliwack Resource District	2-696	2-697				
Sunshine Coast Resource District	2-672	2-679	2-681	2-682	2-683	2-686
Sea to Sky Resource District	2-688	2-689	2-690	2-691	2-698	

The approved Goshawk WHAs within the Soo TSA total 211.5 hectares of mature THLB (0.3 percent of the total THLB) and 68.1 hectares of immature THLB (0.1 percent of the total THLB). Additional Goshawk WHA's are anticipated, which will result in further downward pressure on the timber supply.

Table 11. Summary of the five approved Northern Goshawk WHAs in the Sea to Sky Resource District and the estimated impacts to the THLB

Resource district ¹	WHA tag	WHA name	Area (ha)	Overlap w/ existing land base constraints ² (ha)	Non-contributing and excluded land base (ha)	Overlap w/ unconstrained suitable Marbled Murrelet nesting habitat (ha) ³	Impact to THLB (ha) ^{4,5}		Notes
							Mature	Immature	
DSQ	2-688	Gravell	194.6	0	17.5	0	163.1	12.7	1.3 ha contributing area classified as blank age group in spatial data layer
	2-689	Fire Mountain	233.8	52.0	129.1	0	48.4	55.4	0.8 ha contributing area classified as blank age group in spatial data layer
	2-690*	Douglas Creek	200.6	200.6	200.6	0	0	0	Complete overlap with Spotted Owl WHA. Does not contribute to reducing home range target.
	2-691*	Glacier Lake	287.8	287.8	287.8	0	0	0	Complete overlap with Spotted Owl WHA. Does not contribute to reducing home range target.
	2-698*	Birkenhead River	263.2	263.2	263.2	0	0	0	Complete overlap with Spotted Owl WHA. Does not contribute to reducing home range target.
	Total DSQ		1,179.9	803.6	898.2	0	211.5	68.1	

1 DCK = Chilliwack Forest District; DSC = Sunshine Coast Forest District; DSQ = Sea to Sky Forest District.

2 Includes old growth management areas, ungulate winter range, wildlife habitat areas.

3 Overlap with unconstrained Marbled Murrelet suitable habitat (class 1-3) calculated using provincial Marbled Murrelet suitable habitat layer (2019).

4 Impacts to THLB calculated using the most current Timber Supply Review data package available.

5 Includes contributing and partial contributing.

* Overlaps Spotted Owl WHA classified as long-term owl habitat area (LTOHA)

Numbers may not sum to total due to rounding.

Marbled Murrelet

In 2018, the Province of BC released an Implementation Plan for the Recovery of Marbled Murrelet (*Brachyramphus marmoratus*). An order under the Land Use Objectives Regulation of the *Land Act* establishes the additional amount of suitable habitat to be protected on provincial Crown land. A revised notice under Section 7 of the Forest Planning and Practices Regulation guides the future establishment of spatially defined reserves (WHAs and OGMAs). Combined with existing spatial protection, these new reserves containing suitable habitat are intended to meet the spatial habitat management commitments outlined in the Implementation Plan for the Recovery of Marbled Murrelet in BC.

In TSR 3, the draft WHA from 2008 was used to remove 136 hectares of THLB to protect critical Marbled Murrelet nesting habitat. Based on new information there are 1121 hectares of THLB (1.6 percent of the total THLB) that overlap with Marbled Murrelet habitat within the Soo TSA. 110 hectares of the mapped habitat also overlaps with the TAP priority old growth deferral mapping. There will be a downward pressure on the AAC but as the spatially defined reserves have not been identified, the impacts to the timber supply have not been fully quantified at this time.

Sea to Sky Land and Resource Management Plan (2008)

To date, only minor changes have occurred to the legal Land and Resource Management Plan (LRMP) designations since TSR 3. Consultations regarding additional areas of First Nations cultural significance are ongoing and the potential impact on the THLB cannot be quantified at this time.

Table 12. Changes in the Sea to Sky Land and Resource Management Plan since TSR 3

Sea to Sky LRMP Factor	Accounted for in TSR 3	Changed since TSR 3
Wildland Zones	Yes	No
Squamish Nation Cultural Sites and Village Sites	Yes	No
Lil'wat Nation Spirited Ground Areas	Yes	Yes
In-SHUCK-ch Mountain Cultural Site	Yes	No
Cultural Management Areas	-	-
- Cheakamus and Callaghan CMAs	Yes	No
- Birkenhead River CMA	No	No
Floodplain Management Areas	No	No
Blackwater Pine Mushroom Management Area	Yes	No

Wildland Zones

In 2011, 46 wildland zones were established in the Soo TSA. Wildland zones were accounted for in TSR 3, and timber harvesting is not permitted within these areas.

Squamish Nation Cultural Sites and Village

In TSR 3 22 cultural sites and 3 village sites were mapped and removed from the THLB as LRMP factors. There are several “areas of interest” still to be resolved. Ministry of Forests district staff are working with the Squamish Nation to come to an agreement on the remaining areas.

Lil'wat Nation Spirited Ground Area

The Lil'wat Nation and the Province of BC signed a Strategic Land Use Planning Agreement on April 11, 2008. One of the commitments in the agreement was to undertake a process to protect up to 2000 hectares of old growth forest and sensitive ecosystems. Of the 2000 hectares, up to a maximum of 1000 hectares could be timber currently included as THLB. The agreement was amended on April 22, 2010, recognizing the creation of Ure Creek Conservancy. The amended agreement reduced the amount of old growth available for protection to 425 hectares of THLB.

In 2013, a new 'Q'em'sam (Cultural Place) was designated. This reduced the Soo TSA THLB by 257 hectares (0.4 percent of the total THLB). In 2020, a 692-hectare area within the Lillooet TSA called Pipi7iyekw (Cerise Creek Old-Growth and Sensitive Area) was created, leaving 234 hectares of non-contributing Crown forest left to allocate. There will be no further THLB reductions within the Soo TSA related to the Strategic Land Use Planning Agreement.

The land use agreement also committed to a small-scale forestry program. The intention is to begin implementation in the Cultural Management Areas (CMAs) and continue to apply throughout the Lil'wat Nations Traditional Territory. No assumptions were included in the 2011 base case to attempt to account for this type of forestry program. Timber supply implications of a small-scale forestry plan are currently unquantified.

In-SHUCK-ch Mountain Cultural Site

Although some subzones within the In-SHUCK-ch Mountain cultural site do allow for timber harvesting, the entire area was excluded from the THLB in TSR 3. The cultural site is also within potential Treaty Settlement Lands (described below).

In-SHUCK-ch Treaty Settlement Lands

A *Forest Act* Part 13 designated area was created in 2010 to delineate potential treaty settlement lands (TSL) for the Skatin, Samahquam, and Douglas Nations (formally In-SHUCK-ch Nation). The designated area expired in 2013, however cutting permits were not issued in the area without agreement from the Nations. The Nations were at Stage 5 of the Treaty process at the time that the Sea to Sky LRMP was approved. A Ministerial Order was in place that restricted most forms of harvesting inside the TSL, except for the Nations forest and range non-replaceable forest licence. The Province of BC approved a proposal to allow early access to the TSL for Skatin, Samahquam, and Douglas Nations. The TSR 3 base case did not account for the TSL, which accounts for approximately 7000 hectares of THLB. However, as the Nations have access to logging within the TSL, there is no downward pressure on timber supply.

Birkenhead River Cultural Management Area

The Birkenhead River CMA was not accounted for in the base case of TSR 3. The Birkenhead River CMA does not permit commercial logging in mature and old forests within the Birkenhead River Corridor and limits logging to stands that were less than 40 years old as of March 2008. Harvesting in the Birkenhead River Corridor may be permitted for forest health purposes provided it does not directly affect the integrity of the CMA. The Birkenhead River CMA overlaps with 284 hectares of THLB that were not accounted for in TSR 3. However, the majority of the Birkenhead CMA is covered by Spotted Owl WHAs and therefore is not expected to impact the AAC.

Floodplain Management Areas

Floodplain Management Areas have not been accounted for in the base case for TSR 3. These are mainly non-THLB and would have minimal impact on the AAC.

Blackwater Pine Mushroom Management Area

The Blackwater Pine Mushroom Management Area was mapped as a unique management zone for TSR 3. The constraints on harvesting were modelled the following way: no more than 25 percent of the forested area can be less than five metres in height and a minimum of 50 percent of the forested area needs to be greater than 80 years of age. It is effectively a log around as the N'Quatqua will not support timber harvesting within the area. Most of the area is also within Spotted Owl Long Term Habitat WHAs, so there will be a minimal impact to the timber supply.

Integrated Stewardship Plan for the Indian River Watershed

The Province has resolved the long-standing cabinet mandate to complete an integrated stewardship plan in the Indian River Watershed, approving the partnership agreement in 2022. Although approved, there is currently no associated ministerial order establishing new objectives for the watershed that would currently inform TSR impacts. THLB reductions within the Indian River Watershed are anticipated in the future and can be accounted for in the next Soo TSR.

Changes to the Land Base and Forest Management

The following section outlines other changes in the land base or forest management practices that have occurred in the Soo TSA since the TSR 3 AAC determination.

Changes to the TSA

Community Forest Agreements

Cheakamus Community Forest Agreement K3V

The Cheakamus Community Forest (CFA) Limited Partnership was established on May 11, 2009. It is held by a partnership consisting of the Resort Municipality of Whistler, Squamish Nation, and Lil'wat Nation. In the TSR 3 determination a total of 30 290 hectares were removed from the gross land base. The district staff provided GIS themes to update the TSR master database file as the CFA was not part of the LRDW inventory files at the time of the determination.

A small amendment has taken place to the K3V CFA boundary since TSR 3. An additional 349 hectares (0.5 percent of the total Soo THLB) of Soo TSA THLB needs to be removed to account for the amendment. This represents a small downward pressure on the AAC.

Spelkúmtn Community Forest Agreement K5X

The new Spelkúmtn CFA was issued in 2020. The total and productive forest is 17 730 hectares, while the THLB is 2431 hectares. The Soo TSA AAC of 480 000 cubic metres per year decreased to 467 473 cubic metres per year (reduced by 12 527 cubic metres per year) when the CFA was issued.

Squamish Community Forest Agreement K5Y

The Squamish CFA was issued on December 22, 2022. The CFA boundary encompasses a gross area of 11 304 hectares, with 4435 hectares of THLB removed from the Soo TSA. The Soo TSA AAC was reduced by 22 842 cubic metres per year to account for K5Y through the AAC Administration Regulation.

First Nation Woodland Licences

Lil'wat First Nations Woodland Licence N2V

The Lil'wat First Nations Woodland Licence (FNWL) was issued August 11, 2021, with an AAC of 79 380 cubic metres per year (20 000 cubic metres of the total volume was allocated to BC Timber Sales). To account for the FNWL tenure the Soo TSA AAC was reduced to 391 118 cubic metres per year. The FNWL removed 14 818 hectares of THLB from the Soo TSA.

Clean Energy Projects

Several clean energy projects have been completed or approved within the Soo TSA since TSR 3. The total impact for these projects is estimated at 220 hectares of THLB (0.3 percent of the total THLB), resulting in a mid- to long-term downward pressure on the timber supply.

Community Transmission Line Projects

The Southern St'at'imc Communities Grid Connection Project was not removed from the THLB as part of TSR 3. The project consisted of two sub-stations, one located near the community of Skatin in the north along the Lillooet River, and another at Tipella in the south. The project included approximately 30 kilometres of new transmission lines and mostly paralleled existing roadways that were already excluded from the THLB. The overall project is estimated to impact approximately 30-50 hectares of THLB (0.04-0.07 percent of the total THLB), resulting in a mid- to long-term downward pressure on the timber supply.

Eagle Mountain - Woodfibre Gas Pipeline

FortisBC has an approximately 47-kilometre expansion approved for a portion of their existing natural gas pipeline system that serves Squamish, the Sunshine Coast, and Vancouver Island. It involves adding new 24-inch pipe, beginning north of the Coquitlam watershed, and ending at the proposed Woodfibre LNG site. The gas line will have a minor mid- to long-term downward pressure on timber supply.

Real Estate Developments

A real estate development at Porteau Cove includes 95 hectares of private land that was Crown granted in 2001. District staff also indicate that, once the Porteau Cove subdivision is complete, some nearby Crown timber that was previously considered to be available for aerial harvest is likely to be alienated.

The TSR 3 base case did not account for the 95 hectare (0.1 percent of the total THLB) land base reduction at Porteau Cove, which will result in a small downward pressure on the AAC. The TSR 3 *Rationale for AAC Determination* concluded that Porteau Cove have a negligible impact on the timber supply. The alienation of helicopter accessible timber should be investigated during the next TSR process.

Meager Creek Landslide

The 176 hectares of THLB (0.2 percent of the total THLB) directly affected by the Meager Creek landslide in 2010 was accounted for through a five-year logging deferral in TSR 3. According to Ministry of Forests district staff, it is unlikely that the area will be reforested any time in the short- and mid-term, and perhaps even longer. Therefore, the area should be removed from the THLB.

Harvesting within the Meager Landscape Unit was also indirectly affected because the slide destroyed a bridge that provided the only access to the Meager Landscape Unit. However, recently access has been partially restored by following a new route. There remains a small negative impact to timber supply of 176 hectares. The next TSR should investigate how much additional timber volume may continue to be isolated due to the landslide.

Recreation

Recreation Trails

There are world class recreational trails proposed or built near Squamish, Whistler, or Pemberton, as well as other Adventure Tourism proposals that may impact the THLB depending on where they are located. Those trails or projects constructed or tenured after TSR 3 may have some minor impacts to timber supply depending on how they are tenured. If they are tenured under the *Land Act*, there may be some very minor losses to the THLB that would not have been accounted for in TSR 3. Typically, recreational trails are not associated with major THLB impacts.

Whistler Mountain and Blackcomb Controlled Recreation Areas

Whistler Mountain and Blackcomb Controlled Recreation Areas (CRAs) were designated in 2008 and are effectively log-around areas. There was a small addition to the CRA post-TSR 3, impacting 156.9 hectares of THLB (0.2 percent of the total THLB), generating a small downward pressure on the AAC.

Garibaldi at Squamish Resort

There is an ongoing interest in developing a resort near Brohm Ridge called Garibaldi at Squamish (GAS). The proposed development includes a ski hill, golf course, and residential housing. The Environmental Assessment Office approved the Garibaldi at Squamish project in 2013, with 40 conditions attached to the environmental assessment certificate. Each of the conditions and the certified project description are legally binding requirements that Garibaldi at Squamish Inc. must meet to be in compliance with the environmental assessment certificate. No development has begun on the project to date and their Environmental Assessment Office approval expires if construction does not begin in 2023. BCTS has auctioned some Timber Sale Licences in the area through an interim agreement with the proponent. The gross project area is 2759 hectares and no THLB removals have occurred due to this project to date.

Forest Health Agents and Wildfire

Table 13 displays the TSR 3 estimated average annual unsalvaged volume loss due to catastrophic events such as insect epidemics, fires, wind damage, or other agents. The unsalvaged loss only reflects those areas in which the volume will not be recovered.

Table 13. Unsalvaged losses from fire and insects

Cause of loss	Annual unsalvaged loss (m ³ /year)
Fire	30,000
Insects	4,000
Total	34,000

Insects

Current and projected volume losses can be expected in Douglas-fir stands due to western spruce budworm and Douglas-fir bark beetle. The volume loss estimate was derived by applying a loss factor to the volume of stands currently under attack. Estimates of losses in pine stands attributable to the mountain pine beetle are unknown, but pine comprises only a very small portion of the Soo TSA. Losses to pine types are negligible as this species is only harvested as a minor species component within the TSA.

Fire

The TSR 3 unsalvaged loss estimate due to fire is based on 10 years of district fire reports. The total losses were reduced so that only volume loss that occurred in the THLB is included in the estimate.

Current non-recoverable losses (NRLs) are lower than modelled in TSR 3 as per Table 14. TSR 3 predicted non-recoverable losses of 34 000 cubic metres per year, while the data from 1999 to 2019 shows an average loss of 14 164 cubic metres per year.

Table 14. Non-recoverable volume losses within the Soo TSA from 1999-2019

Year	Volume killed (m ³)	Non-recoverable volume (m ³)	THLB volume killed (m ³)	THLB non-recoverable volume (m ³)
1999	196,854	182,685	34,282	27,190
2000	67,640	59,410	11,419	9,333
2001	68,573	63,459	10,776	9,147
2002	93,412	87,463	15,552	13,115
2003	78,973	73,707	14,937	10,840
2004	147,606	140,845	23,630	19,973
2005	53,580	52,575	9,606	9,083
2006	240,182	233,615	31,540	28,093
2007	188,829	185,764	22,136	20,548
2008	113,454	111,260	11,023	9,827
2009	188,216	187,408	2,6596	26,358
2010	47,180	46,056	6,674	5,764
2011	26,408	25,466	4,983	4,216
2012	29,775	29,632	1,706	1,583
2013	17,152	17,100	1,118	1,082
2014	41,216	41,140	2,294	2,250
2015	1,410,792	1,404,836	90,858	90,415
2016	40,984	39,841	3,352	2,617
2017	30,230	30,209	1,568	1,547
2018	15,414	15,414	1,023	1,023
2019	24,964	24,964	3,431	3,431
Grand Total	3,121,434	3,052,849	328,504	297,435
Average	148,640	145,374	15,643	14,164
			TSR 3 NRL	34,000
			Difference:	-19,836

Boulder Creek Wildfire

The 2015 Boulder Creek wildfire burned 1640 hectares of THLB (2.3 percent of the total THLB), 890 hectares (1.2 percent of the total THLB) of the burned area had a high severity code (Table 15). Some of the severely burned area will likely be reclassified as non-productive (NP) in the VRI once it has been field verified. Some has been classified as NP rock in RESULTS but not all will likely be mapped in the VRI as it may only be small pockets of NP.

Most of the severely burned THLB area was less than 101 years old (83 percent). This likely makes the burn primarily a mid- to long-term timber supply issue. Wildfires were accounted for in TSR 3 through non-recoverable volume losses of 34 000 cubic metres per year.

Table 15. Boulder Creek wildfire burn severity

Burn severity	THLB (ha)	Non-THLB (ha)	FMLB (ha)	Percent volume reduction
High	890	771	1,661	80%
Medium	152	283	435	50%
Low	599	755	1,354	20%
Unburned	305	395	699	0%
Total	1,945	2,204	4,149	

Table 16. Boulder Creek wildfire burn severity by age group

Age group	Burn severity	THLB (ha)	Non-THLB (ha)	FMLB (ha)
0-100	High	735	176	911
	Medium	100	40	140
	Low	455	227	682
	Unburned	215	108	323
Subtotal		1,505	551	2,056
101+	High	155	595	750
	Medium	52	244	295
	Low	144	527	672
	Unburned	89	287	376
Subtotal		440	1,653	2,093
Total		1,945	2,204	4,149

Public Review

No formal public review around a Section 3.1 postponement was required or conducted.

First Nation's Engagement

{summarize the FN consultation process and any comments received during the review period}

Conclusion

In the May 2011 AAC determination for the Soo TSA, the chief forester determined the effective AAC to be 480 000 cubic metres per year. The base case harvest projection that supported the May 12, 2011, AAC determination had an initial harvest of 503 000 cubic metres per year for 60 years which increased to a long-term harvest level of 612 000 cubic metres per year. Three area-based tenures have been issued since 2011, resulting in a current AAC of 368 276 cubic metres per year.

Section 8 (3.1) of the *Forest Act* states that if the chief forester considers that the AAC is not likely to be changed significantly with a new determination, the chief forester can postpone the next determination to a date that is up to 15 years from when the last determination was made. A total of 1641 hectares of THLB (2.3% of the total THLB) have been impacted and not reflected in the AAC since the TSR 3 determination, 1371 hectares (1.9 percent of the total THLB) impacting the short-term. It is reasonable to assume that an AAC determined with currently available information would not be significantly changed from the determination made in TSR 3.

Information that may become available cannot be part of the rationale for postponing an AAC determination and is for information purposes only. There are however several changes in progress within the Soo TSA, such as updates to the provincial site productivity layer, TAP priority old growth deferrals, Northern Goshawk and Marbled Murrelet WHA's. Improvements in knowledge and information regarding current policies and practices will be included in the next TSR, and will reduce the uncertainty associated with the complex and dynamic nature of forest ecosystems, changes in resource use patterns, and social priorities. A postponement for a period of up to five years is recommended, generating a TSR determination deadline of May 12, 2026.

Appendix 1 Summary of Changes

The following colour codes are intended to help interpret summary Tables 17 to 19.

Light gray = Inconsequential unknown
Orange = Minor unknown downward pressure
Red = Moderate to high unknown downward pressure
Blue = Unknown minor upward pressure
No colour = Quantifiable impacts

Table 17. Changes to the forest composition and harvest history since the TSR 3 determination

Factor		Description	Impact		
			Short-term	Mid-Term	Long-Term
Forest Composition					
Mature Inventory Audit	Seven CMI plots were sampled between 2019-2020. The sample size is not statistically significant for comparison, as there are too few samples to report on.	No change	No change	No change	
Young Stand Monitoring	Six plots were sampled between 2019-2020, unfortunately the sample size is not statistically significant for comparison. The Forest Analysis and Inventory Branch plans to run a separate analysis grouping ground sample data by BEC-subzones rather than by administrative boundaries. This work has not yet begun but could be used in the future TSR process.	No change	No change	No change	
Site Productivity	Implementation instruction from TSR 3. For the next TSR, the provincial site productivity layer would be used, which is significantly more accurate. Field work will be started in September 2022, with data anticipated to be available in the fall of 2023.	No change	No change	No change	
Harvest History					
Harvest Performance	68 percent of the AAC was harvested over the period of 2011-2020	Unknown upward	Unknown	Unknown	
Accumulated Volume	For information only as tenures branch indicated that there are no disposition agreements in place for any of the volume at this point in time. 1,144,251 m³ of Accumulated and Unallocated volume: 155,647 m³ of Non-First Nation Accrued Unlicensed Volume, 423,790 m³ of First Nation Accrued Unlicensed Volume, 424,814 m³ of Major Licence Unharvested Volume, 140,000 m³ of Unused BCTS volume.	No change	No change	No change	
Helicopter Logging Performance	Helicopter harvest in ECAS between 2012-2020 averaged eight percent of the total harvest. In the TSR 3 base case 19.9 percent of the volume comes from the helicopter Douglas-fir/cedar land base.	Unknown downward	Unknown	Unknown	
Harvestable Age	The harvested blocks between 2017-2021 are split between age classes as follows: 40-60 26%, 60-80 14%, 80-100 2%, 100-120 2%, 120-140 2%, 140-250 22%, 250+ 32%. It is recommended that a sensitivity is performed during the next TSR, examining the age of harvested stands and CMAI.	No change	No change	No change	

Utilization Standards	The minimum top diameter inside bark was modelled as 10 cm not 15 cm for non-pine species > 121 years old due to the growth and yield models' limitations. For both an average western hemlock tree and a Douglas-fir tree, the difference in volume is about three percent. Timber supply models only track the leading species of stands scheduled for harvest, not the component species.	Unknown downward	Unknown	Unknown
Operability				
- Slope	Based on the <i>Soo TSA Provincial Timber Objectives Management Report</i> timber harvesting is being conducted on a higher proportion of slopes between 0-50 percent and avoiding slopes 51 percent and greater compared with the VRI profile.	Unknown downward	Unknown	Unknown

Table 18. Changes to Integrated Resource Management within the Soo TSA since the TSR 3 determination

Factor	Description	Impact		
		Short-term	Mid-term	Long-term
Integrated Resource Management				
Old Growth Deferrals	13,955 hectares of THLB (18.4 percent of the total THLB) is considered by the TAP to be priority at-risk old forest. Support from First Nations for TAP deferrals is mixed and the impacts are expected to be far less than the 13 955 hectares of TAP overlapping the Soo TSA.	Unknown downward	Unknown downward	Unknown downward
Wildlife Management Areas	Pemberton Wetlands WMA was not accounted for in TSR 3, resulting in a reduction of the THLB by 57 hectares (0.08 percent of the total THLB).	0.08% Downward	0.08% Downward	0.08% Downward
- Northern Goshawk	Five goshawk WHAs have been approved, with the impact to the Soo TSA estimated at 211.5 hectares (0.3 percent of the total THLB) of mature THLB and 68.1 hectares (0.1 percent of the total THLB) of immature THLB. Additional Goshawk WHA's are anticipated, which will result in further downward pressure on the timber supply.	0.4% Downward	0.4% Downward	0.4% Downward
- Marbled Murrelet	There are 1,121 hectares of THLB (1.6 percent of the total THLB) overlapped with Marbled Murrelet habitat. There will be a downward pressure on the AAC but as the spatially defined reserves have not been identified, the impacts to timber supply have not been fully quantified at this time.	Unknown downward	Unknown downward	Unknown downward
Sea-to-Sky LRMP				
- Squamish Nation Cultural Sites and Village Sites	There are several “areas of interest” still to be resolved. Ministry of Forests district staff are working with the Squamish Nation to come to an agreement on the remaining areas.	Unknown downward	Unknown downward	Unknown downward
- Lil'wat Nation Spirited Ground Area	THLB reduction of 257 hectares (0.4 percent of the total THLB) for a new Cultural Place (‘Q'em'sam) designated in 2013.	0.4% Downward	0.4% Downward	0.4% Downward
Integrated Stewardship Plan for the Indian River Watershed	There is no associated ministerial order establishing new objectives for the watershed that would inform TSR impacts. THLB reductions within the Indian River Watershed are anticipated and can be accounted for in the future Soo TSR 4.	No change	No change	No change

Table 19. Changes to the land base within the Soo TSA since the TSR 3 determination

		Impact		
		Short-Term	Mid-Term	Long-Term
Factor	Description			
Changes to the Land Base and Forest Management				
Cheakamus Community Forest Agreement	In the TSR 3 determination a total of 30 290 hectares was removed from the gross land base. A small amendment has taken place to the community forest boundary since TSR 3. An additional 349 hectares of the Soo TSA THLB needs to be removed to account for the amendment.	0.5% Downward	0.5% Downward	0.5% Downward
Clean Energy Projects	Estimated impact of 220 hectares of THLB (0.3 percent of the total THLB).	No change	0.3% Downward	0.3% Downward
Community Transmission Line Projects	Estimated impact of 30-50 hectares of THLB (0.04-0.07 percent of the total THLB).	No change	0.07% Downward	0.07% Downward
Eagle Mountain – Woodfibre Gas Pipeline	The expansion of FortisBC’s gas line will have a minor mid- to long-term downward pressure on timber supply.	No change	Unknown downward	Unknown downward
Real Estate Developments	Estimated impact of 95 hectares of THLB (0.1 percent of the total THLB) due to Porteau Cove subdivision development.	0.1% Downward	0.1% Downward	0.1% Downward
Meager Creek Landslide	Estimated impact of 176 hectares of THLB (0.2 percent of the total THLB). Landslide occurred in 2010 and was accounted for through a 5-year logging deferral in TSR 3. District indicated that it should be removed from the THLB as it will not be reforested anytime soon.	0.2% Downward	0.2% Downward	Unknown downward
Recreation				
- Whistler Mountain and Blackcomb Controlled Recreation Areas	There was a small addition to the CRA post-TSR 3 of 156.9 hectares of THLB (0.2 percent of the total THLB).	0.2% Downward	0.2% Downward	0.2% Downward
Forest Health Agents & Wildfire				
- Non-recoverable losses	TSR 3 predicted non-recoverable losses of 34,000 m³/yr, while the data shows average losses of 14,164 m³/yr from 1999 to 2019. TSR 3 overestimated non-recoverable losses from wildfire and insects by an average of 19,836 m³/yr or 5.1%.	No change	No change	No change
Total Quantified Impacts:	The quantified impacts from Tables 17 to 19	1.88% Downward	2.25% Downward	2.05% Downward