

Cassiar TSA Timber Supply Analysis Public Discussion Paper

**Forest Analysis and Inventory Branch
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Ministry of
Forests, Lands and
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Cover photograph courtesy of Will Foster
Skeena Stikine Natural Resource District
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Introduction

The British Columbia Ministry of Forests, Lands and Natural Resource Operations (FLNR) regularly reviews the timber supply^a for all timber supply areas^b (TSA) and tree farm licences^c (TFL) in the province. This review, the third for the Cassiar 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 Cassiar TSA.

According to Section 8 of the *Forest Act* the chief forester must regularly review and set new AACs for all 38 TSAs and 34 TFLs in the Province of British Columbia (BC).

The objectives of the timber supply review (TSR) 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 (PDP) provides a summary of the results of the timber supply analysis for the timber supply review of the Cassiar TSA. Details about the information used in the analysis are available on request from the Ministry of Forests, Lands and Natural Resource Operations, Forest Analysis and Inventory Branch. 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.

^aTimber supply

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

^bTimber supply areas (TSAs)

An integrated resource management unit established in accordance with Section 7 of the Forest Act.

^cTree farm licences (TFLs)

Provides rights to harvest timber and outlines responsibilities for forest management in a particular area.

^dAllowable annual cut (AAC)

The maximum amount of timber harvest permitted each year from a specified area of land, usually expressed as cubic metres of wood.

Timber supply review in the Cassiar TSA

The current AAC for the Cassiar TSA, which was determined by the chief forester on November 7, 2011, is 305 000 cubic metres, and includes the following partitions: 120 000 cubic metres for the Iskut and Boundary supply block, 153 000 cubic metres for the Dease–Liard supply block and 32 000 cubic metres for the Atlin supply block.

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 Cassiar TSA.

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 AAC determined by the chief forester during this timber supply review may differ from the harvest projections, including the base case, presented in this paper, 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, Lands and Natural Resource Operations 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 licenses and, where possible, to new opportunities.

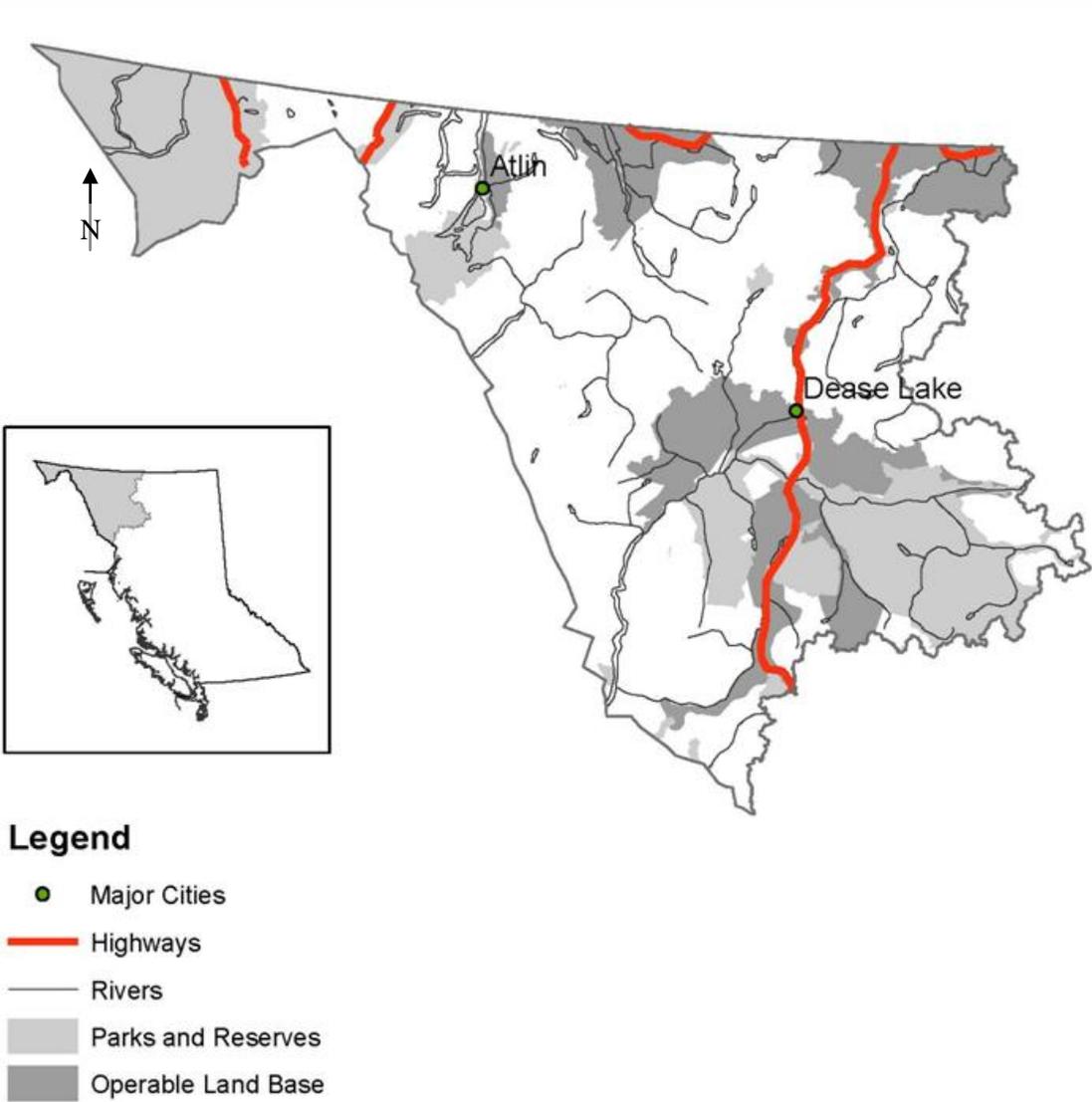


Figure 1. Map of the Cassiar TSA.

Description of the Cassiar TSA

The Cassiar TSA in northwestern BC is the largest and least populated TSA in the province. Covering 13.1 million hectares, or one-sixth of the province, the TSA boundaries coincide with those of the Skeena Stikine Natural Resource District. The Cassiar TSA is administered by the FLNR Skeena Stikine Natural Resource District office in Smithers. Communities within the TSA include: Dease Lake, Atlin, Telegraph Creek, Iskut, Good Hope Lake and Lower Post.

Natural resources

The Cassiar TSA is characterized by mountains and plateaus separated by wide valleys and lowlands, while the western part of the TSA consists of rugged, ice capped mountains, dissected by several major river valleys. There are numerous resources within the TSA, including wildlife, recreation, tourism amenities, minerals and forest products. Many of these values are underdeveloped and are located in inaccessible areas of the TSA.

Boreal forests predominate in most of the TSA; however, areas of coastal forest occur in the west. The major tree species in the TSA are lodgepole pine, white and black spruce, western hemlock and subalpine fir (balsam) (Figure 2). Lodgepole pine forests are located mostly in the northern portion of the TSA and dominate about 30 percent of the Crown forested land base^c (CFLB). Western hemlock, spruce and balsam dominate stands in the southern portion of the TSA, where the majority of the trees are older than 150 years (Figure 3). Conversely, stands dominated by interior species such as lodgepole pine tend to be younger than 100 years due to the high frequency of wild fires. In the timber harvesting land base^f (THLB), pine-leading stands are more prevalent (54 percent *versus* 30 percent) and balsam-leading stands are less prevalent (6 percent *versus* 24 percent) than in the CFLB.

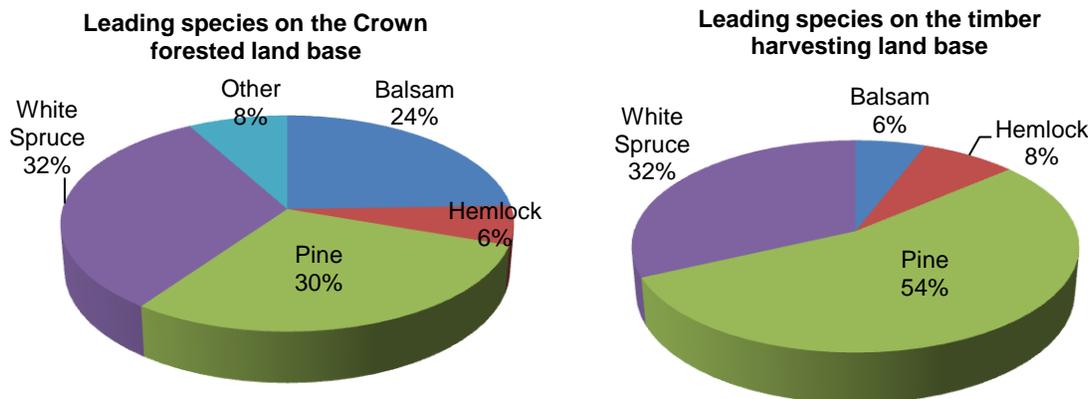


Figure 2. Proportion of leading species for the Crown forested land base and timber harvesting land base of the Cassiar TSA.

^c**Crown Forested Land Base (CFLB)**
 The forested area of the TSA that the provincial government manages for a variety of natural resource values. This 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 (e.g., brush areas). The CFLB does include federal protected areas because of their contribution to biodiversity.

^f**Timber harvesting land base (THLB)**
 The portion of the CFLB that is managed for timber supply by the Ministry of Forests, Lands, and Natural Resource Operations where timber harvesting is considered both acceptable and economically feasible, while meeting objectives for all relevant forest values, existing timber quality, market values and applicable technology.

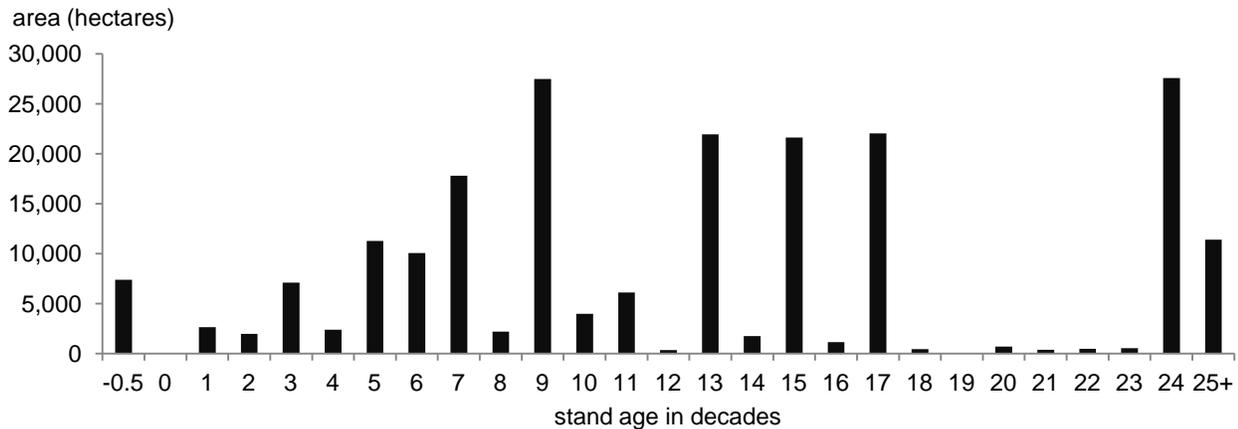


Figure 3. Age class distribution of the timber harvesting land base.

The Cassiar TSA supports an abundance of wildlife species. Moose are the most abundant ungulate, but thin horn sheep, caribou and mountain goats are also plentiful. Grizzly bears, black bears, wolverines, lynx and wolves are common throughout the valleys of the TSA. Many bird species also occur, and several species breed nowhere else in BC. A wide variety of fish are also present, due to the occurrence of watersheds that drain into both the Pacific and Arctic Oceans. Five salmon species are found in the Stikine, Taku and Tatshenshini watersheds, while freshwater fish species are found throughout the TSA and include: rainbow trout, Arctic grayling, Dolly Varden char, lake char, white sucker, whitefish and northern pike.

The large expanses of pristine wilderness in the TSA, which provide opportunities for multi-day trips into remote backcountry areas, especially along the rivers, are highly valued. Several provincial parks—Atlin Lake, Stikine River, Spatsizi Plateau, Mount Edziza and Tatshenshini-Atsek—offer internationally renowned backcountry wilderness opportunities. The Cassiar TSA is also one of the finest big-game trophy hunting areas in North America. Other recreational activities include canoeing, rafting, kayaking, fishing and wildlife viewing.

First Nations

First Nations whose traditional territories overlap the Cassiar TSA include: Kaska Dena, Tahltan, Tlingit, Carcross Tagish and Champagne-Aishihik First Nations. Of the population living within the TSA, 55 percent to 65 percent are First Nations people.

The Ministry of Forests, Lands and Natural Resource Operations has been communicating with First Nations about this timber supply review and will continue to fulfill its legal obligations to consult with First Nations in conjunction with the release of this public discussion paper.

Land use plans

Cassiar Iskut-Stikine Land and Resource Management Plan (LRMP)

The Cassiar Iskut-Stikine Land and Resource Management Plan (LRMP) plan area, encompasses about 5.2 million hectares in the Cassiar TSA, roughly corresponding to the Stikine River watershed and the Canadian portion of the Unuk River watershed. The land use planning process that led to the development of the LRMP provided an opportunity for the public, the Tahltan Nation, special interest groups and governments to make recommendations regarding proposed protected areas and future management of public forest lands in the plan area.

Government approval of the LRMP in 2000 was expected to be followed by more detailed landscape-level strategic planning; however, this process has not occurred. Although the direction in the approved LRMP did not result in the establishment of legal objectives by the provincial government, the plan recommendations ultimately led to the establishment of additional protected areas totalling more than 200 000 hectares. These areas were excluded from the THLB used in the base case.

Dease-Liard Sustainable Resource Management Plan (SRMP)

The Dease-Liard SRMP encompasses about 2.4 million hectares within the Dease-Liard supply block in the Cassiar TSA. The SRMP area extends south-to-north from Dease Lake and the Upper Turnagain watershed to the Yukon Border and west-to-east, from the Little Rancheria watershed to Tatisno Mountain and Tatisno. The majority of the plan area falls within the traditional territory of the Kaska Dena First Nation, although there is overlap with Tahltan First Nation territory in the southwest and with the Teslin Tlingit territory in the west. There are three communities within the plan area: Dease Lake, Good Hope Lake, and Lower Post. Watson Lake is 20 kilometres north of the plan area, across the Yukon border.

The 2004 Dease-Liard SRMP addressed sustainable management of land and resources within the plan area, primarily with a forest management focus. Forest management objectives, indicators, and targets were developed for wildlife, biodiversity, cultural heritage, visual quality, community use, and timber values. Many components of the SRMP were established as legal objectives through a higher level plan order. These legal requirements are reflected in the base case.

In 2010, additional draft SRMP chapters were created to address resource values not included in the original SRMP. With the exception of the draft recommendation to protect the Ne'ah'-Horseranch/Deadwood Area, government has not established any additional legal requirements based on the 2010 draft chapters. In the base case the Ne'ah'-Horseranch /Deadwood Area was excluded from the THLB.

Wooshtin wudidaa Atlin Taku Land Use Plan

The Atlin Taku Land Use Plan area is 3.04 million hectares, and includes those portions of the Taku, Whiting and Yukon watersheds within the province of BC. The western boundary of the plan area abuts the Alaska Panhandle, and the northern boundary follows the BC border with the Yukon Territory. The Atlin Taku planning area is geographically complex, comprised of mountainous terrain with broad river floodplains, large glacial fields and extensive plateaus. The plan area is the ancestral home of the Tlingit First Nation. Atlin is the only sizable community and commercial centre in the plan area, other than the Tlingit reserve on the eastern shores of Atlin Lake.

The Atlin Taku Land Use Plan (LUP) was signed in July 2011 by the Premier of BC and representatives of the Taku River Tlingit. The plan did not establish legal objectives, but it sets the stage for future decision making. The plan assists in resolving access, protection, and mineral development issues, and provides clarity with respect to the values and objectives to be considered in future resource management decision-making. The plan includes a recommendation to increase the total protected area in the LUP area by up to 800 000 hectares or 26 percent. In the base case, the area associated with the protected areas was excluded from the THLB.

Forest management

Current forest management must be consistent with the requirements of the *Forest and Range Practices Act* 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. Therefore, 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 (see next section).

Timber harvesting land base

As part of the process used to define the timber harvesting land base (THLB) in the timber supply analysis, a series of deductions are made from the productive forest land base. These deductions account for the factors that effectively reduce the suitability or availability of the productive forest area for harvest, for ecological, economic or social reasons.

The total area within the boundaries of the Cassiar TSA is 13 131 876 hectares. After accounting for areas that are not managed by FLNR, parks, tundra and non-forest, there are 2 504 089 hectares of forested lands managed by the Crown – Crown forested land base (CFLB). Within the remaining CFLB approximately 93.6 percent is not available for harvesting because it occurs in areas such recreational sites, wildlife habitat or not suitable for harvesting. Of the total TSA only 210 681 hectares (1.6 percent) is available for timber harvesting and is referred to as the timber harvesting land base (THLB) or harvestable area (see Table 1).

Table 1. Timber harvesting land base – area netdowns

| Land base description | Total area on file ¹ (ha) | Area sequentially removed from land base (hectares) | Percent of TSA (%) | Percent of productive forest (%) |
|---|--------------------------------------|---|--------------------|----------------------------------|
| Total Cassiar TSA area | 13 131 876 | - | 100 | |
| Not managed by FLNR | 2 768 260 | 2 768 260 | 21.1% | |
| Non-forest | 7 537 074 | 5 687 231 | 43.3% | |
| Non-productive forest | 9 924 496 | 2 048 874 | 15.6% | |
| Non-commercial forest | 1 592 496 | 123 423 | 0.9% | |
| Total reductions | | 10 627 787 | 80.9% | |
| Total Crown forest land base managed by FLNR | | 2 504 089 | 19.1% | 100.0% |
| Outside of operable blocks | 10 738 467 | 1 553 151 | 11.8% | 62.0% |
| Recreation (UREP) | 179 894 | 5 636 | <0.1 | 0.2% |
| Community watersheds | 3 858 | 2 425 | <0.1 | 0.1% |
| Geographically defined areas | 418 292 | 6 661 | 0.1% | 0.3% |
| Caribou habitat (no harvesting zone) | 27 697 | 3 499 | <0.1 | 0.1% |
| Bull Trout habitat (no harvesting zone) | 1 216 | 652 | <0.1 | <0.1% |
| Non-commercial species | 875 919 | 89 521 | 0.7% | 3.6% |
| High slope sites | 1 338 804 | 30 836 | 0.2% | 1.2% |
| Low productivity stands | 3 846 292 | 544 649 | 4.1% | 21.8% |
| Pulp stands not in Iskut Blocks | 49 772 | 3 794 | <0.1 | 0.2% |
| Slow growing stands | 585 807 | 37 283 | 0.3% | 1.5% |
| Preservation visual quality objective area | 25 152 | 2 300 | <0.1 | 0.1% |
| Cultural trails | 9 610 | 2 195 | <0.1 | 0.1% |
| Current roads, trails and landings ¹ | 2 633 | 307 | 0.0% | <0.1% |
| Riparian habitat ² | 415 | 105 | <0.1% | <0.1% |
| Wildlife tree patch | 10 391 | 10 391 | 0.1% | 0.4% |
| Current timber harvesting land base (THLB) | | 210 681 | 1.6% | 8.4% |
| Future roads trails and landings | | 8 217 | 0.1% | 0.3% |
| Long-term timber harvesting land base | | 198 161 | 1.5% | 7.9% |

¹ Land base may fall into several categories therefore some figures may seem extremely large. For example, an area may be non-forested, therefore, it is also non-productive.

² The table only accounts for roads, riparian reserves and riparian management zones within the operable blocks. Area outside of the operable blocks has been accounted for by other land base reduction factors.

Land base and forest management changes since 2000

The current AAC for the Cassiar TSA came into effect on January 1, 2002. Since then, there were several changes regarding land use, forest management, and available information and these changes are reflected in the timber supply analysis. The major changes are:

- strategic land-use planning has been undertaken in the Dease-Liard and Atlin areas of the TSA;
- the visual landscape inventory has been updated (2013);
- natural stand yield estimates were derived using the Variable Density Yield Projection (VDYP) model version 7 without inventory audit adjustments;
- Cassiar biogeoclimatic ecosystem classification (BEC) line work and coding has been significantly refined by Forest Analysis and Inventory Branch staff, in a 2011 BEC update;
- the district's definition of the "operable corridor" in the TSA has been revised;
- "not satisfactorily regenerated" site information has been improved using the BC land classification system (BCLCS) in the vegetation resources inventory. Fire history information was upgraded using RESULTS and FTEN data and satellite photography. This has resulted in improved non-recoverable loss[§] estimates; and
- natural stand disturbance for stands outside of the THLB has been included in the timber supply analysis; and pulp wood stands within the Iskut operable blocks were included in the base case.

Socio-economic information

The Cassiar TSA is the largest and least populated TSA in the province. Lack of transportation infrastructure, hydro-electric power and small, scattered populations limit the economic development in the area. The resident population, which is estimated to be 2000 people, resides primarily in the communities of Dease Lake, Atlin, Iskut, Telegraph Creek, Good Hope Lake and Lower Post.

The economy relies heavily on the mining, tourism, public, recreation and to a small extent forestry sectors. There are numerous known mining deposits with the potential for more discoveries. Big game hunting and recreation opportunities are world class which provides seasonal work for many people.

Currently, one non-replaceable 10-year forest licence, for 120 000 cubic metres per year has been issued to the Cassiar Forest Group. Operations under the licence are managed by the Stikine Forest Products Limited Partnership, which is a joint venture company of Alcan Forest Products and Brinkman Forest Restoration. The operations employ approximately 20 people. In addition, 2500 cubic metres per year have been apportioned to BC Timber Sales and 12 500 cubic metres per year have been apportioned to the Forest Service Reserve for disposition through small scale harvesting licences such as, Forestry Licence to Cut, Free-Use Permits for firewood and Christmas trees and Road-Use Permits.

There are no major processing facilities within the TSA and most of the harvested timber is either processed outside of the TSA or exported out of BC.

§Non-recoverable loss

Non-recoverable losses are timber volumes destroyed or damaged by natural causes such as fire and disease that are not recovered through salvage operations.

There are several major projects being developed within the TSA. The North West Transmission Line being constructed from Terrace to Bob Quinn is intended to provide energy to both industry and communities. Projects currently under development include run-of-the-river power generation to improve energy availability. Mining exploration, planning and development is increasing significantly in the TSA. Current activities are focused on the mining of copper, gold, silver, and molybdenum.

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, including regeneration after 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 FLNR staff believe reflects the best available information 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 forecast in the base case.

The area considered eligible for timber harvesting in the Cassiar TSA is not contiguous. There are four major operational blocks within the TSA: Iskut, Dease-Liard, Swan-Teslin and Atlin. To prevent over harvesting of any one block, the harvest levels for each block were developed separately in the timber supply analysis. In addition, the Iskut block was subdivided into "A" and "B" blocks to acknowledge that stands in the "B" block will not be accessible for at least 10 years. Within these blocks, the sawlog and pulpwood components were projected separately in the model. In order to reflect current harvesting practice, stands with the highest volume per hectare were harvested first in the model.

Fire is a major source of natural disturbance in the TSA. Historic fire information was used to develop the assumptions used in the analysis. Stands within the THLB that were assumed to remain unsalvaged after fires were accounted for as non-recoverable losses. Based on fire return interval studies stands in the non-THLB were modelled by resetting the stand age back to zero following fires.

The base case forecast (Figure 4) shows that a harvest level of 329 000 cubic metres per year, which is 24 000 cubic metres per year more than the current AAC of 305 000 cubic metres, can be maintained for the entire 250-year forecast. This type of harvest flow is referred to as "even-flow". Figure 5 shows the even-flow harvest contribution of each of operational blocks and sub-blocks described above. Table 2 provides a numeric summary of the information depicted in Figure 5.

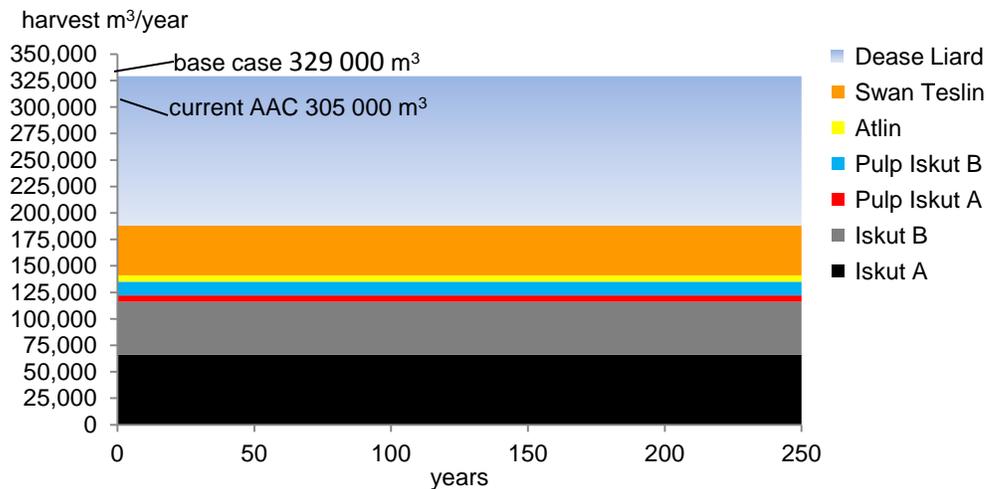


Figure 4. Base case timber supply forecast for the Cassiar TSA.

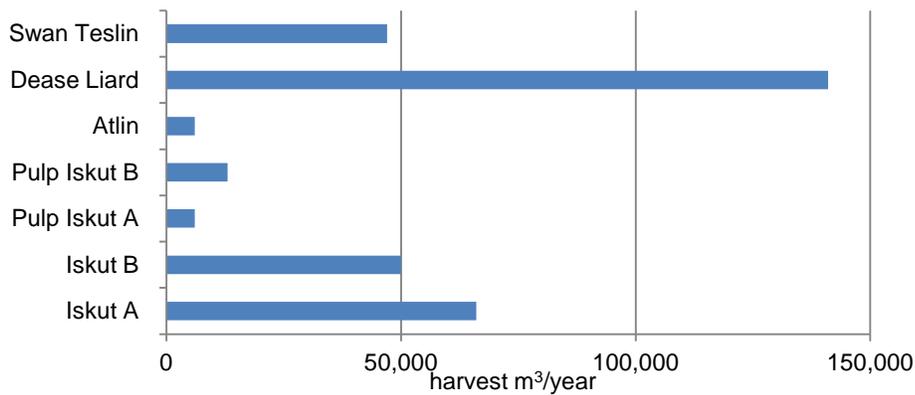


Figure 5. Contribution to the base case even-flow level by operational block and sub-block.

Table 2. Base case harvest forecast (m³/year) by subsection of the operable land base

| Iskut A | Iskut B | Pulp Iskut A | Pulp Iskut B | Atlin | Dease-Liard | Swan-Teslin | Total |
|---------|---------|--------------|--------------|-------|-------------|-------------|---------|
| 66 000 | 50 000 | 6 000 | 13 000 | 6 000 | 141 000 | 47 000 | 329 000 |

During the first 50 years of the base case, the average area of forest stands harvested is about 1650 hectares per year and stands are harvested at an average age of 140 years and an average volume of 240 cubic metres per hectare. For the remainder of the base case, the average area of forest stands harvested is about 2100 hectares per year and stands are harvested at an average age of 100 years and an average volume of 180 cubic metres per hectare.

Historic harvest performance

Prior to 1997, there was little commercial timber harvesting within the Cassiar TSA. Between 1997 and 2012, an average of 17 percent of the AAC was harvested with most of the harvesting occurring in the last four years. The AAC is the maximum permissible level of harvesting and the amount of actual harvesting each year fluctuates depending on a variety of factors, including on the market conditions.

Sensitivity analyses

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 uncertain information or known differences in the assumptions used in the base case.

Key issue: existing/natural stand volume estimation

The forest cover inventory for the Cassiar TSA was collected primarily in the 1970's and later converted to vegetation resources inventory (VRI) format. In 2011, a VRI based on the photo-interpretation of aerial photography (VRI Phase I) of about 15 000 hectares in the TSA was completed. The inventory information used in this timber supply analysis was updated for depletion to 2011 and then projected for growth.

In the previous timber supply review, results from a 1997 statistical audit of the inventory for mature forest sample plots were re-stratified and applied to stands that had been grouped into coastal and interior analysis units. The results showed that existing stand volumes based on the forest cover inventory were overestimated by about 14 percent for the coastal analysis units and by about 49 percent for the interior analysis units. In a sensitivity analysis prepared for the 2001 timber supply analysis, it was found that using the inventory audit adjusted volumes decreased the base case timber supply by 16 percent.

In the AAC determination, the chief forester acknowledged that the results of the inventory audit indicated that the existing stand volumes used in the base case had been overestimated. However, the chief forester noted that re-stratification of the inventory audit results for application to coastal and interior analysis units introduced a great deal of uncertainty. On this basis, the chief forester concluded that the base case timber supply was likely overestimated in a range between 0 and 16 percent. In the AAC determination, the chief forester accounted for this uncertainty by reducing the base case timber supply by 8.5 percent.

The statistical audit of the inventory and the timber supply analysis prepared for the previous timber supply review used the ministry's Variable Density Yield Projection (VDYP) model version 6 to estimate the volumes for existing/natural stands. In January 2009, a comparison of the volume estimates generated by VDYP 6 to those generated by the newer VDYP 7 model showed that VDYP 7 underestimates, on average, VDYP 6 volumes by 24.7 percent for the Cassiar TSA. This discrepancy increases the level of uncertainty associated with the existing stand yields used in the current base case.

For this timber supply review, the area within 57 approved cutting permits from the last 10 years was compared to the THLB derived for the analysis. It was found that 13 percent of the area under cutting permits were in areas now considered non-THLB in this analysis. These results underscore the uncertainty associated with the inventory available for the Cassiar TSA.

For the base case, the inventory audit information was not used to generate the volume estimates for existing stands due to the uncertainty associated with the inventory information. In order for the chief forester to consider the risk associated with the existing stand volume estimates used in the base case, a sensitivity analysis was prepared. The results indicate that decreasing the existing/natural stand volumes by 10 percent decreases the base case even-flow harvest level by 12.1 percent. The sensitivity analysis results for the individual operational blocks appear in Table 3 below.

Table 3. Sensitivity analysis results

| Period | Iskut A ¹ | Iskut B | Pulp Iskut A | Pulp Iskut B | Atlin | Dease-Liard | Swan-Teslin | Total |
|---|----------------------|---------|--------------|--------------|--------|-------------|-------------|---------|
| Base case | 66 000 | 50 000 | 6 000 | 13 000 | 6 000 | 141 000 | 47 000 | 329 000 |
| Single flow harvest for the TSA – no operable blocks | | | | | | | | |
| Harvest m ³ | | | | | | | | 363,000 |
| Percent change | | | | | | | | +10.3 |
| Highest harvest level for first 15 years and then return to the base case harvest level | | | | | | | | |
| Harvest m ³ | 141 000 | 81 000 | 3 000 | 10 000 | 10 000 | 216 000 | 57 000 | 518 000 |
| Percent change | +213.6% | +62.0 | -50 | -23.1 | +66.7 | +53.1 | +21.2 | +57.4 |
| Reduce existing/natural stand volume by 10% | | | | | | | | |
| Harvest m ³ | 61 000 | 43 000 | 6 000 | 13 000 | 6,000 | 117 000 | 43 000 | 289 000 |
| Percent change | -7.5 | -14.0 | 0 | 0 | 0 | -17.0 | -8.5 | -12.1 |
| Change harvest rule to oldest first | | | | | | | | |
| Harvest m ³ | 77 000 | 54 000 | 8 000 | 15 000 | 6 000 | 141 000 | 57 000 | 358 000 |
| Percent change | +16.7 | +8.0 | +33.3 | +15.4 | 0 | 0 | +21.2 | +8.8 |
| No natural disturbance modelling | | | | | | | | |
| Harvest m ³ | 69 000 | 50 000 | 8 000 | 14 000 | 6 000 | 146 000 | 47 000 | 340 000 |
| Percent change | +4.5 | 0 | +33.3 | +7.7 | 0 | +3.5 | 0 | +3.3 |
| Model managed stands with provincial site productivity estimates | | | | | | | | |
| Harvest m ³ | 67 000 | 50 000 | 9 000 | 10 000 | 9 000 | 130 000 | 54 000 | 329 000 |
| Percent change | +1.5 | 0 | +50.0 | -23.1 | +50.0 | -7.8 | 14.8 | 0 |

¹ In the sensitivity analysis the first priority is to harvest at the highest rate of harvest in the sawlog Iskut 'A' block even if the harvest in the remaining blocks falls below base case levels.

Single flow harvest for the TSA – no operational blocks

In the base case, harvesting was restricted by operational blocks in order to prevent the model over harvesting any individual block. In a sensitivity analysis, removing this restriction improves the harvest level for the TSA by 10 percent. The relatively small change in timber supply is mainly due to the operational blocks being independent of each other; i.e., forest cover requirements, such as those for landscape-level biodiversity are met within each block, not spread over many blocks.

Highest harvest level for the first 15 years and then return to the base case harvest level

The level of an even-flow harvest depends on the harvest level that is attainable when timber availability is most constrained. This is referred to as a 'pinch point'. In this analysis, pinch points occur around year 90 and again at year 250 in the base case. Since these pinch points occur in the long term, a sensitivity analysis was prepared to see how much flexibility there is in the short-term harvest levels, while still maintaining the base case harvest level for the remainder of the forecast. The results indicate that at the TSA level, the short-term harvest level can be increased by 57.4 percent to 518 000 cubic metres per year. At the operational block level, the increase in TSA level harvest increases the harvest levels in the Iskut 'A' and 'B' sawlog blocks, by 213.6 percent and 62 percent, respectively. For the Atlin, Dease-Liard and Swan-Teslin blocks timber supply is increased by 66.7 percent, 53.1 percent and 21.2 percent, respectively. However, for the Iskut 'A' and 'B' pulpwood blocks timber supply is decreased by 50 percent and 23.1 percent, respectively.

These results suggest that with the flexibility to shift harvesting around between operational blocks, such that harvesting is increased in some blocks and decreased in others, it may be possible for the TSA to support higher short-term harvest levels without compromising mid- to long-term harvest levels.

Reduce existing/natural stand volumes by 10 percent

The results of this sensitivity analysis are discussed under “Key issue: existing/natural stand volume estimation” earlier in this PDP.

Change harvest rule to oldest first

In the base case, stands with the highest volumes were given priority for harvesting in the model. In previous timber supply analyses for the Cassiar TSA, harvest priority was assigned based on age, such that the oldest stands were harvested first. The advantage of the “oldest first rule” is that it enables some of the more productive first- and second-growth stands to grow for a longer time, thereby producing more volume prior to harvest. Assigning harvest priority based on stand age instead of stand volume resulted in only a slight increase in harvest level over the base case.

Remove the modelling of natural disturbance (wildfire) in the base case

Fire is a major source of natural disturbance in the TSA. Historic fire information was used to develop the assumptions used in the analysis. Stands within the THLB that were assumed to remain unsalvaged after fires were accounted for as non-recoverable losses. Stands that were projected to be disturbed by fire in the non-THLB were modelled by resetting the stand age back to zero. In a sensitivity analysis, removing these natural disturbance assumptions had very little impact on the base case because the non-THLB in the TSA is substantially larger than the THLB. In the event that a large fire occurred in one of the operational blocks that had a significant effect on timber supply, it is likely that the chief forester would re-determine the AAC for the TSA sooner than the 10-year maximum allowed under legislation.

Model post-harvest stands using provincial site productivity estimates

Currently there are no localized SIBEC (PEM/TEM) estimates for the Cassiar TSA. In the base case, site productivity for regenerated stands was based on the forest cover inventory. A sensitivity analysis was performed using estimates based on provincial SIBEC and biophysical site index (SI) estimates. In the resultant forecast the harvest level was essentially the same as the base case level.

Summary

The current base case indicates that it is possible to achieve a harvest level of 329 000 cubic metres throughout the 250-year forecast. This level is slightly higher than the current AAC of 305 000 cubic metres. There is a lot of uncertainty associated with the estimation of existing/natural stand volumes. Further review of the existing stand volume information is ongoing and any new methods or information that may become available will be provided to the chief forester for consideration prior to the AAC determination.

The provincial chief forester’s AAC determination is a judgement based on professional experience and 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 harvest forecasts, including the base case, described in this public discussion paper.

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 Cassiar TSA. Ministry staff would be pleased to answer questions to help you prepare your response. Please send your comments to the district manager at the address below.

Your comments will be accepted until November 18, 2013.

You may identify yourself on the response if you wish. If you do, 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/>