Haida Gwaii

Public Review Period *for an* Annual Allowable Cut Determination

By the

Haida Gwaii Management Council

November 2019

1. Executive Summary

Haida Gwaii consists of more than 150 islands located roughly 80 kilometres off the northern mainland coast of British Columbia (BC). In 2009, the Council of the Haida Nation and the Province of British Columbia ('the Province'), while acknowledging dispute of title over Haida Gwaii, signed the historic *Kunst'aa Guu – Kunst'aayah Reconciliation Protocol* (Reconciliation Protocol).

Through the Reconciliation Protocol, both Governments choose a more respectful approach to co-existence by way of land and natural resource management through shared and joint decision-making. One aspect of the 2009 Reconciliation Protocol was a commitment to establish the Haida Gwaii Management Council (HGMC). This commitment was enabled by the Council of the Haida Nation's 2010 KaayGuu Ga ga Kyah ts'as – Gin 'inaas 'laas 'waadluwaan gud tl'a gud giidaa (*Haida Stewardship Law),* and BC's *Haida Gwaii Reconciliation Act*. With this commitment and legal authorities in place , the HGMC was formed in 2011.

The HGMC consists of two members appointed by the Haida Nation, two members appointed by the Province, and a chairperson jointly appointed by both Governments. The HGMC has the authority to make joint decisions related to a specified set of strategic land and resource decisions

Prominent among the official responsibilities of the HGMC, is the determination of an allowable annual cut (AAC), to define how much timber may be commercially harvested each year from the Haida Gwaii Management Area ('Haida Gwaii') – which encompasses all of Haida Gwaii except for private land, and areas within Indian Reserves and municipalities. The HGMC sets an AAC for Haida Gwaii, and the *Haida Gwaii Reconciliation Act* requires that the determination of AACs for specific management units (Tree Farm Licences, Timber Supply Area, Woodlots, Community Forest Agreements, and First Nations Woodland Licences) not exceed the overall level determined by the HGMC. Further information on the HGMC can be found at: http://www.haidagwaiimanagementcouncil.ca/

A key purpose of the Haida Gwaii timber supply review is to ensure that the AAC reflects the protected areas and ecosystem-based management (EBM) regime stemming from the 2007 Strategic Land Use Agreement and the *Haida Gwaii Land Use Objectives Order*; and reflects any new land use decisions and inventory updates affecting the forest management land base.

The HGMC mandated the Joint Technical Working Group, made up of technical representation from the Council of the Haida Nation and the Province, to oversee the technical process associated with the timber supply review. The Joint Technical Working Group prepared the 2019 Haida Gwaii timber supply review *Data Package* and *Timber Supply Analysis Report* for the HGMC. The *Data Package* describes the inputs and approaches that were used in the timber supply modelling, while the *Timber Supply Analysis Report* describes the findings from the modelling; both documents are key to informing the AAC determination for Haida Gwaii.

As part of the technical process, a computer-generated spatially explicit projection of timber supply available under assumed land use and forest management conditions was prepared to provide a 'base case' harvest projection. Analytical findings are described briefly in this discussion paper and include the 'base case' projection showing that for all of Haida Gwaii an even flow annual harvest level of 842,781 cubic metres can be maintained.

This base case projection is not a recommended AAC for Haida Gwaii. The base case is just one of several projections and sources of information the HGMC will consider in its AAC determination. Other sources include the ideas, opinions, and personal experiences of people who live on Haida Gwaii and/or who consider their interests to be affected by the determination. As part of the AAC determination process the HGMC will consider the technical data as well as social, economic and cultural considerations, including those brought forward through the engagement processes.

To engage Haida citizens, other residents of Haida Gwaii and in BC, the HGMC is circulating this *Public Discussion Paper* as an integral part of its decision-making process. This *Public Discussion Paper*

provides information on the timber supply analysis, forest management issues, and socio-economic factors that HGMC will consider in making its determination, as well as on the AAC determination process itself. The HGMC hopes this will enable individuals, communities, licensees, and other interested parties to provide informed responses on any matter that they believe should be considered in the AAC determination, whether consistent with, or critical of, any data, information or approaches used in the *Data Package*. The HGMC now therefore invites and welcomes your feedback on any aspect of this *Public Discussion Paper*, and/or on any other issue or concern that you feel needs to be considered in assessing the timber supply on Haida Gwaii.

To that end, please see Section 13 **'Your Feedback is Needed'** at the end of this document. To help the determination process to remain on schedule, we would appreciate receiving your comments during the **Public Review and Comment period. In consideration of the upcoming holiday season, the HGMC is extending this period from November 15, 2019 to January 14, 2020.**

Following the HGMC's AAC determination for Haida Gwaii, the Province's Chief Forester, using the same technical information and public feedback from this *Public Discussion Paper*, will then make separate AAC determinations for the Timber Supply Area (TSA) and the two Tree Farm Licences (TFLs) on Haida Gwaii that must not in total, when combined with Woodlot Licence AACs, exceed the HGMC AAC determination. After the Chief Forester's determinations are made, the Minister of Forests, Lands, Natural Resource Operations and Rural Development ('the Minister') will apportion the TSA AAC to different forest tenure types.

2. Introduction

Major Government-to-Government agreements, protocols, processes and land use objectives that have shaped the timber supply review for Haida Gwaii are highlighted in this section.

Timber Supply Review

A timber supply review assesses the amount of timber available for harvesting over time. An allowable annual cut (AAC) is the maximum average level of timber harvest permitted for a forest management area, usually expressed as cubic metres of wood. The AAC represents a harvest level that aims to balance environmental, economic, social and cultural considerations.

When undertaking a timber supply review in support of an AAC determination, basic elements of timber supply need to be described:

- The location and types of forest including timber volumes and values (forest inventory)
- How fast forests grow over time (growth and yield)
- Where timber harvesting can occur (timber harvesting land base)
- Forest management practices based on legal requirements and other factors such as economics
- Rate or level of harvesting over time (such as even-flow annual harvest levels).

The unique AAC circumstance of Haida Gwaii

The authority for determining the AAC on Haida Gwaii rests with the HGMC, a specially mandated body established under the *'Kunst'aa Guu – Kunst'aayah' Reconciliation Protocol*; as well as in the *Haida Gwaii Reconciliation Act*, and in the *Haida Stewardship Law*. This unique arrangement has developed from these and other significant agreements reached between the Council of the Haida Nation and the Province as described below.

2007 Strategic Land Use Agreement

The 2007 Strategic Land Use Agreement between the Council of the Haida Nation and the Province identified land use zones (including new protected areas, special value areas, and operating areas), and provided EBM objectives for cultural, aquatic, biodiversity and wildlife values.

2009 Kunst'aa Guu – Kunst'aayah Reconciliation Protocol

The 2007 Strategic Land Use Agreement was followed by the co-signing of the historic 2009 *Kunst'aa Guu – Kunst'aayah Reconciliation Protocol* ('Reconciliation Protocol') by the Council of the Haida Nation and the Province.

The 2009 Reconciliation Protocol, whose title means 'in the beginning', is a commitment by both Governments to continue working together toward comprehensive reconciliation, focussing on joint and shared strategic-level decision making respecting lands and natural resources on Haida Gwaii, and other collaborative arrangements. The Reconciliation Protocol includes agreements to address:

- Shared and joint decision making
- Carbon offset and resource revenue sharing
- Forest tenures and other economic opportunities
- Enhancement of Haida socio-economic well-being.

Haida Gwaii Management Council (HGMC)

The 2009 Reconciliation Protocol committed both Governments to a process for shared decision-making regarding resource use on Haida Gwaii, notably by requiring the creation of the HGMC, which was established in 2011. The 2009 Reconciliation Protocol required both Governments, in consultation with the other, to appoint two members, and to then jointly appoint a chairperson. The HGMC's documented responsibilities include making key strategic decisions through a joint decision-making process that aims to achieve consensus. If consensus is not reached, a vote will be taken, excluding the chairperson, and in the event of a tied vote, the chairperson will cast a deciding vote.

Joint decisions made by the HGMC focus on:

- Implementation and amendment of the 2007 Haida Gwaii Strategic Land Use Agreement
- Establishment, implementation and amendment of land use objectives for EBM forest practices
- **Determination of the AAC for Haida Gwaii**
- Approval of management plans for protected areas
- Development of policies and standards for the identification and conservation of heritage sites.

Significant in the above list is the third point, the requirement for the HGMC to determine an AAC for Haida Gwaii; it is in support of this requirement that this *Public Discussion Paper* was prepared.

Land Use Objectives

To further implement the 2007 Strategic Land Use Agreement and consistent with the 2009 Reconciliation Protocol, both Governments collaboratively developed land use objectives.

The land use objectives for forest-based values were formally agreed upon by both Governments and were established through the 2010 *Land Use Objectives Order* as legal requirements to further the implementation of EBM. The 2010 Order was amended by the HGMC in 2014 and 2017 to support improved implementation of EBM. Forest plans and practices on Haida Gwaii must be consistent with the land use objectives that include:

- Cultural objectives
- Aquatic objectives
- Wildlife objectives
- Biodiversity objectives.

The timber supply review therefore has accounted for these land use objectives in support of the HGMC's AAC determinations.

3. Haida Gwaii Timber Supply Review

This Timber Supply Review (TSR) was prompted by two considerations. In 2014 an updated inventory on the forests of Haida Gwaii (Vegetation Resource Inventory, or VRI) was completed, and between 2015-2017 the inventory was independently audited. Between 2012-2015 both Governments monitored the rate of cedar harvests on Haida Gwaii relative to the maximum ceiling set by the Chief Forester's AAC determination in 2012. The HGMC initiated an early TSR with an interest in applying the new forest inventory to an updated AAC determination, as well as informing the timber supply for cedar. The HGMC's AAC determination process began with the appointment of a Joint Technical Working Group co-led by both Parties to provide two timber supply review reports: (i) a *Data Package* that describes current forest management as a basis from which to assess the timber supply on Haida Gwaii; and (ii) a *Timber Supply Analysis Report* that documents results of a spatially explicit analysis, including projections of feasible future harvest levels based on inputs about the forest and how it grows, and the objectives and practices used to protect and conserve important values. In addition, the HGMC commissioned a socio-economic analysis report for Haida Gwaii. The three reports are available at: www.haidagwaiimanagementcouncil.ca.

The projections in the *Timber Supply Analysis Report* include a 'base case' projection that reflects current land use and forest management conditions. However, the base case projection is not a recommended AAC for Haida Gwaii; rather, it provides one of the several sources of information the HGMC will consider in making its AAC determination. Other information sources include: sensitivity analyses (prepared as part of the timber supply analysis - see Section 11) that examine different assumptions in forest management, and compares that with the base case; the socio-economic analysis report; and—very importantly and the reason for this paper—the ideas, opinions, and personal experiences of people who live on Haida Gwaii, and/or who consider their interests to be affected by the determination.

The HGMC hopes that the information in this *Public Discussion Paper* will engage local communities across Haida Gwaii, as well as other individuals, licensees, and interested parties to provide informed responses on any matter that they believe should be considered in the AAC determination. All of information received during the comment period will be taken into account by the HGMC before making their AAC determination.

To provide your ideas and suggestions, please see Section 13 **'Your Feedback is Needed'** at the end of this document – which, for example, states where you can submit your feedback. To help the determination process remain on schedule, we would appreciate receiving your written comments by January 14, 2020 which is the end of the 60-day Public Review and Comment period.

The 2009 Protocol requires all decisions by the HGMC, which include AAC determinations, be made by consensus or vote as described earlier in Section 2 under 'Haida Gwaii Management Council'. These requirements are mirrored in the *Haida Gwaii Reconciliation Act*, which also requires HGMC decisions to be published in the *BC Gazette*. The decision will also be published in the Haida Laas newsletter, the Haida Gwaii Observer, and the Haida Gwaii Trader. The HGMC's rationale document for its AAC determination will be posted on its website www.haidagwaiimanagementcouncil.ca and in the *BC Gazette*.

Stages in the AAC determination process

- Joint Technical Working Group began assembling data for data package
- The Province's Chief Forester provided information needed to analyze timber supply to HGMC
- Data package, timber supply analysis, and socio-economic analysis completed [November 2019]
- **Public discussion paper released [November 2019]**
- **60-day Period for Review and Comment by public and licensees** [November 15 to January 14, 2020]
- AAC determination for Haida Gwaii by HGMC completed and conveyed to Chief Forester
- HGMC rationale released

- BC's Chief Forester determines AACs for specific management units within limits of HGMC determination (see 'Chief Forester's role' below)
- Chief Forester's determination and rationale released (anticipated in early 2020).

Chief Forester's role

The Province's Chief Forester will make separate AAC determinations for the TSA and two TFLs that must not in total, when combined with Woodlot Licence AACs, exceed the overall AAC determined by the HGMC for Haida Gwaii. It is anticipated that the Chief Forester will make these determinations as soon as possible after the HGMC determines the new AAC for Haida Gwaii. The determinations by the Chief Forester are required by Section 8 of the Province's *Forest Act*, under which the Chief Forester must regularly determine a new AAC for all TFLs and TSAs in BC.

What the AAC determination does and does not do

The new AAC set by the HGMC will regulate how much timber may be harvested on Haida Gwaii, and the decisions by the Chief Forester will determine how much of the AAC may be harvested from each TFL and the TSA. A key purpose of the AAC determinations is to establish allowable harvest levels that are sustainable and consistent with the land use objectives that support the EBM regime for Haida Gwaii.

The AAC determination does not allocate harvesting rights or direct forest practices. These decisions are made through other processes - for example, the Minister will apportion the AAC that is determined for the TSA among various types of forest tenures, and the HGMC can amend the land use objectives that support EBM implementation. The AAC determination process does not make land use decisions, such as adding new protected areas. The sensitivity analyses conducted through this process can help inform future land use or resource management decisions.

4. Description of Haida Gwaii

Xaadaa Gwaay, Xaaydaġa Gway yaay, or Haida Gwaii ("Islands of the people") is an archipelago of more than 150 islands off the north coast of BC. The mainland north coast of BC lies 80 kilometres to the east across Hecate Strait, and the state of Alaska lies to the north across Dixon Entrance. Haida Gwaii's total landmass of just over a million hectares is situated mostly on two main islands: the larger, *Kiis Gwaay* (Graham Island), being to the north; and *Gwaay Haanas* (Moresby Island) to the south.

The geography of the Islands is similar to the mainland coast of BC and the southern regions of Alaska, including mountainous terrain, deep fjords, temperate rainforests, sub-alpine forests and alpine tundra.

The rugged mountains that dominate the west side of the Islands descend abruptly into the ocean to form a steep, rocky coastline. The weather is cool and wet, with deep snow at higher elevations. Steep headwater streams and gullies drain the mountainsides, carrying water, sediment and organic materials to the alluvial fans and floodplains that line the valley bottoms.

The Skidegate Plateau occurs east of the west coast mountains and includes the most productive forest lands on the Islands. Many of the largest trees found on Haida Gwaii are located within the Skidegate Plateau. The Plateau has high levels of biodiversity with some of the best habitat for wildlife found anywhere on the Islands.

Relatively flat, lowlands are found to the northeast of the Skidegate Plateau. This area is dominated by extensive blanket bogs, shallow lakes and scrub forest, with patches of productive forest in well-drained areas.

The diverse geography and landscapes of the Islands is reflected in its biological diversity. There are many plant and animal species and sub-species that are only found on the Haida Gwaii archipelago. This is one reason why the Islands are often referred to as "the Galapagos of the North."

Coastal temperate rainforests represent only 2% of the world's forests but provide critical habitat for many unique species. BC has a sizeable percentage of the world's coastal temperate rainforests in areas like Haida Gwaii and the Great Bear Rainforest. Haida Gwaii's coastal temperate rainforests occur at lower elevations with western hemlock, western redcedar and Sitka spruce being the most dominant tree species along with lodgepole pine, western yew, and red alder. High elevation tree species include mountain hemlock and yellow-cedar. At yet higher altitudes, closed forests give way to open parkland forests and alpine meadows. About 80% of Haida Gwaii is forested.

Haida Gwaii supports a wide range of wildlife including species for which land use objectives have been established. These are black bear, northern goshawk, northern saw-whet owl, marbled murrelet, and great blue heron.

As shown in Figure 1 and later in Table 3, about half of Haida Gwaii is in protected areas. Figure 1 also shows the location of the three main forest management units on the Islands: the Timber Supply Area (TSA) and two Tree Farm Licences (TFLs).

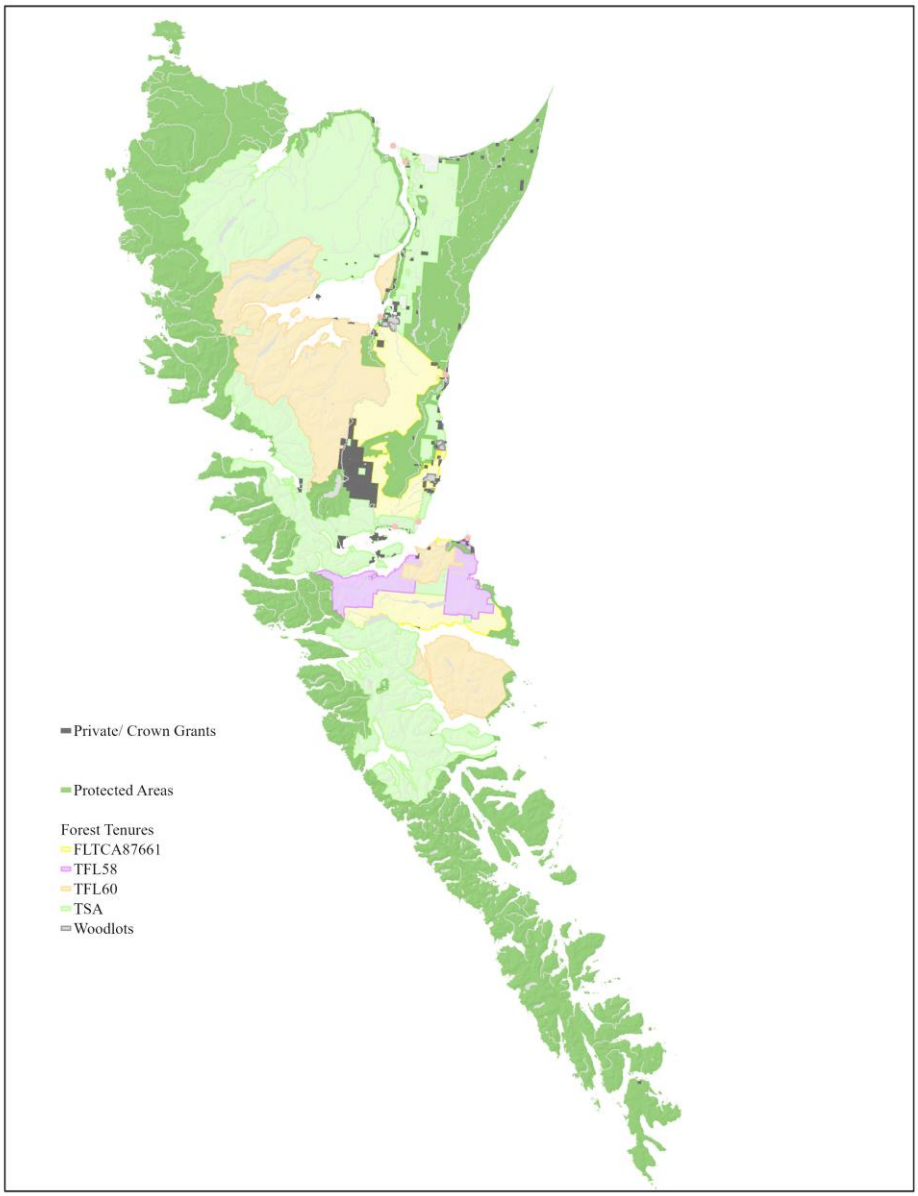

Figure 1: Protected Areas and Forest Management Units on Haida Gwaii

5. Socio-economic Conditions

This section highlights key findings from the *Socio-Economic Analysis in support of the Haida Gwaii Timber Supply Review* report that was commissioned by the HGMC. The socio-economic report provides sources of data for the information presented in this section of the *Public Discussion Paper*, and is available at: www.haidagwaiimanagementcouncil.ca.

Population

The 2016 population of Haida Gwaii was 4,198, a 12.8% decrease from the 2006 population of 4,812, and a 28.0% decrease from the 1996 population level. By comparison, the overall population of BC rose by 12.2% over the 2006-2016 period. In 2016, an estimated 47.5% of the Haida Gwaii population identified as an Aboriginal/Indigenous person. The Haida population of Haida Gwaii was an estimated 1,915 in 2016, a 1.6 % increase over the 2006 population of 1,885. Although demonstrating a positive trend, the Haida population increase of 1.6% trailed, by a large margin, the 38% increase in the overall BC Aboriginal/Indigenous population during the 2006-2016 period.

The five main communities by population in 2016 are Queen Charlotte (852), Skidegate (*Hig̲aagilda)* (837), Masset (793), Old Massett (*G̲aw)* (555), and Port Clements (282); these communities account for about 80% of the overall population on Haida Gwaii. The remaining 20% of the population inhabits other areas of Haida Gwaii including the unincorporated communities of Tlell, rural Graham Island, and Sandspit. Skidegate was the only Haida Gwaii community or area that registered a population gain for the 2006-2016 period. The median age of the Haida Gwaii population increased from 39.7 years to 45.1 years over the 2006-2016 period, By comparison, the estimated 2006 median age on the islands was similar to that of the province (40.8 years) whereas by 2016, the estimated Haida Gwaii median age (45.0) was higher than the BC median of 43.0 years.

Labour Force

Table 1 shows the estimated total number of labour force workers[1] resident on Haida Gwaii and estimates for the three main sectors (public services, tourism and forestry) in 2016 and 2006. The resident labour force in 2016 totaled 2,290 workers, a 19.1% decline from the 2006 total of 2,830. Worker numbers in two of the main sectors, tourism and forestry, declined over the 2006-2016 period, 9.4% and 10.8%, respectively, but by a lesser amount than in the public services sector and other sectors (as a group).

Sector	2016 #	2016 %	2006 #	2006 %	% change 2016 vs 2006
Tourism	387	16.9	427	15.1	-9.4%
Forestry	290	12.7	325	11.5	-10.8%
Public Services	640	27.9	795	28.1	-19.5%
Other Sectors	**973**	**42.5**	**1,283**	**45.3**	**-24.2%**
Total	**2,290**	**100**	**2,830**	**100**	**-19.1%**

Table 1: Haida Gwaii Labour Force, 2016 and 2006

The preceding table focused on the resident labour force. Both the forestry and tourism sectors on Haida Gwaii have historically utilized non-resident workers who either reside seasonally or long-distance commute for periods of one or more weeks to Haida Gwaii. Generally, less data and information are available on this group of workers but a survey conducted for this timber supply review indicates that the on islands resident share of Haida Gwaii forestry employment has risen in recent years. This shift appears

[1] Includes persons working part-time and full-time

to be largely due to the efforts of Haida Gwaii headquartered Taan Forest Products Ltd. to utilize Haida Gwaii resident workers and contractors. Fishing resort lodges (an estimated 16 in 2018) have collectively been an important factor in the Haida Gwaii tourism sector since the 1990s but they have relied as a group on a significant number of off islands seasonal and full-time workers. A new study (expected to report in 2019) may show a greater reliance on local workers at these lodges, in part due to Haida Gwaii-headquartered HaiCo's entrance into the fishing lodge sector and its efforts to hire Haida Gwaii resident workers for its lodges.

AACs and Haida Gwaii Timber Harvest

Table 2 shows recent AACs for Haida Gwaii management units TSA 25, TFL 58, and TFL 60. The sum of the management unit AACs determined in 2012 for Haida Gwaii was 931,000 cubic metres, a decline of 47.5% from the previous total AAC of 1,772,616. The four woodlot licences contribute an additional 9,293 cubic metres of AAC.

Management Unit	**AAC determined in 2012** (cubic metres)	**Prior AAC** (cubic metres)	**% change in AAC**
TSA 25	512,000	869,748	-41.1%
TFL 58	79,000	100,000	-21.0%
TFL 60	340,000	802,868	-57.7%
All Units	**931,000**	**1,772,616**	**-47.5%**

Table 2: Recent AACs for Haida Gwaii Management Units (cubic metres)

The 5-year average annual harvest on HGMA lands was 831,172 cubic meters between 2013 and 2017 which is about 10% less than the sum of the current AACs.

Although the available timber supply for annual harvesting was in the 1.2–1.8 million m^3 range over the 2000–2012 period, the amount of timber harvested by commercial operators and supplied into domestic and international markets fell well short of these levels due to target market demand conditions, cost constraints, and administrative and policy parameters on the Haida Gwaii timber supply side. During the 10-year 2003-2012 period prior to the initial AAC determination of the HGMC, the Haida Gwaii annual timber harvest averaged approximately 780,000 m^3, well below the cumulative total of the then current Haida Gwaii AACs and below the average annual harvest for the 5-year 2013-2017 period.

Over the 2008-2017 decade, red and yellow cedar accounted for an annual average share of almost half (48.4%) of the total Haida Gwaii Management Area (HGMA) harvest. Historically, stands with substantial percentages shares of old growth western redcedar volumes have formed a large portion of the operable timber harvesting landbase of Haida Gwaii. This accessible local cedar supply in combination with the strong and large scale external demand for cedar logs and wood products in Canada, the U.S. and abroad over the past couple of decades, have resulted in both attractive prices for cedar logs and wood products and substantial cedar timber harvests on both HGMA lands and private lands.

As throughout coastal BC, log export volume from Haida Gwaii has increased markedly over the past decade. The volume and share of the timber harvest on HGMA lands that was exported under provincial log export rules climbed from 61,552 m^3 and a 9.1% share of the HGMA lands harvest in 2010 to 267,873 m^3 and a 41.5% share in 2017. Lower value whitewood species accounted for the vast majority of coastal BC export logs because the Government of BC limits the issuance of export permits for cedar logs to ceremonial or religious uses (incorporation into construction of a religious temple for example). No red or yellow cedar logs harvested on HGMA lands over the 2010-2017 period were exported outside of BC; the HGMA lands harvest that was exported outside of BC was comprised of whitewood logs.

Forest Sector Employment Trends

Both timber harvesting and wood processing employment of Haida Gwaii residents fell since the mid-2000s. The main factors contributing to declines in harvesting-related employment were:

- Lower AACs in response to new protected areas and land use objectives (see Table 2)
- Actual harvest levels over the 2013-2017 period were about 10% lower than the AAC level set forth in the 2012 determination for the HGMA
- 2008 financial crisis that lowered demand for wood products in key markets (U.S. housing for example) resulting in less timber harvesting and associated forestry employment on Haida Gwaii that recovered but not to the pre-financial crisis levels
- Increased use of mechanized (less labour intensive) harvesting methods
- Timber harvest permitting challenges
- Forestry labour supply sourcing challenges

Timber processing activity and associated employment has historically been relatively low on Haida Gwaii and dropped in recent years. The total amount of Haida Gwaii timber processed on the islands was small (5%) in 2002-2004 by comparison to the Haida Gwaii volume processed elsewhere, which is also the current situation. In the 2015-2017 period, the portion of the Haida Gwaii harvest annually processed on the islands was an estimated 0.6%. The main factor in the reduction of wood processing employment on Haida Gwaii is the combination of adverse operational and financial challenges faced by Haida Gwaii Forest Products (formerly Abfam), which has a small sawmill in Port Clements. This facility was shuttered in 2017 but discussions have taken place between the owners and potential investors about renovating and re-opening this Port Clements mill. The portion of the Haida Gwaii harvest processed in BC and controlled by Haida Gwaii focused operations did increase significantly, however, due mainly to TaanForest Product Ltd.'s establishment of a custom cut program, which was an addition to the well-established custom cut programs of O'Brien & Fuerst and Husby Forest Products Ltd.[2] The custom cut programs of these Haida Gwaii focused harvesting operators accounted for the majority of the Haida Gwaii logs that stayed in BC for processing (and supported associated mill employment).
During the 2015-2017 period, the estimated annual average direct employment on Haida Gwaii based on harvesting and processing HGMA timber was 285 person years (PYs), and the majority of this direct employment, 270 PYs (95%), was in harvesting activities including log transport.[3] In terms of total employment on Haida Gwaii, which also includes an estimate of the employment supported by forestry firms purchasing goods and services and the employment supported by forest sector connected households locally buying goods and services, the average annual effect of the local forest sector activity on Haida Gwaii was an estimated 414 PYs during the 2015-2017 period.

On a province-wide basis, the employment effects connected to harvesting and processing Haida Gwaii timber more than double. During the 2015-2017 period, the estimated annual average direct employment in the province based on harvesting and processing HGMA timber was 622 PYs and the total employment effect was an estimated annual average of 1,244 PYs. Although Haida Gwaii resident workers accounted for the largest share of harvesting direct employment (82%), on islands workers held less than half of the total (harvesting and processing) direct employment (43%) because of the small amount of wood processing activity on Haida Gwaii.

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[2] Custom cutting programs on coastal BC are based on a market logging or log trading operations renting capacity and services at southwest BC sawmills in order to process their harvested logs (mainly cedar logs) and to sell the resulting lumber products to wholesalers and retailers in Canada, the U.S. and internationally. Custom cut programs are an alternative to owning and operating wood processing facilities.

[3] Employment is stated in person-years (PYs), which is defined as one person working the equivalent of one full year, which is defined as 180 days of work. A person working for 90 days accounts for 0.5 PYs. Full-time equivalents (FTEs) is a term that is used inter-changeably with PYs.

6. Timber Supply Analysis and the Land base

Haida Gwaii Timber Supply Review Considerations

The AAC determination for Haida Gwaii will be the second undertaken by the HGMC that involves a comprehensive review of the timber supply for all of the forest management units on Haida Gwaii into one determination.

The Haida Gwaii land use objectives were used by the Joint Technical Working Group to support the Haida Gwaii timber supply review. The land use objectives support an EBM regime on Haida Gwaii that in many cases supersedes or augments objectives under the Province's *Forest and Range Practices Act.* However, where the land use objectives requirements do not apply, forest practices must still be consistent with the *Forest and Range Practices Act*. The Haida Gwaii timber supply review accounts for all protected areas including heritage sites, conservancies, ecological reserves, parks and protected areas as these areas do not contribute to timber supply.

Timber Supply Analysis – improved information and analysis since the last time

Since the last timber supply review that supported the HGMC's 2012 AAC determination, a number of changes have occurred to improve the Haida Gwaii timber supply analysis including use of:

- New forest inventory
- Improved site productivity estimates based on a higher number of Haida Gwaii field samples
- Improved information on growth and yield with model estimates compared against field plots
- Improved operational data to estimate the timber harvesting land base and reflect forest practices based on implementation of the land use objective order
- Better data in general (e.g. use of LiDAR for new terrain and fluvial mapping)
- Refined estimates of natural disturbances
- Detailed operability modelling
- More sophisticated spatial model
- Large number (over 60) of sensitivity analyses.

Protected Areas

Protected areas, where timber harvesting is excluded, are valuable areas that help ensure continuance of the natural values that support activities integral to the traditional way of life of the Haida, and also ensure protection of the environmental values that attract visitors from all over the world. This visitor activity is also an important contributor to the economy of Haida Gwaii. The Council of the Haida Nation and the Province collaboratively manage provincial protected areas. The Council of the Haida Nation and the federal government collaboratively manage Gwaii Haanas. In the timber supply review, all protected areas on Haida Gwaii (listed in Table 3) were excluded from the timber harvesting land base.

Protected Area	Area (hectares)
Gwaii Haanas National Park & Heritage Site	145,753
Daawuuxusda	70,295
Damaxyaa	822
Drizzle Lake	814
Duu Guusd	144,762
Duu Guusd Ecological Reserve	8,684
K'uuna Gwaay	2,105
Kamdis	1,894
Kunuxalas	3,344

Protected Area	Area (hectares)
Naikoon Provincial Park	67,268
Nang Xaldangaas	6,897
Pure Lake Provincial Park	142
SGaay Taaw Siiwaay K'adjuu	597
Tlall	16,208
Tow Hill Ecological Reserve	451
Yaaguun Gandlaay	2,450
Yaaguun Suu	7,970
Total	**480,456**

Table 3: Protected Areas on Haida Gwaii

Forest Tenures

The majority of the area on which timber harvesting is permitted is contained within two Tree Farm Licenses (TFLs), TFL 58 and TFL 60, and the Timber Supply Area (TSA) as shown in Figure 1.

TFL 60 is a replaceable area-based tenure that was purchased in 2012 by Taan Forest – a 100% Haida-owned forest company, and a wholly owned subsidiary of the Haida Enterprise Corporation, the economic development entity of the Haida Nation whose shareholders are Xaayda *Haida* citizens. TFL 60 is the largest area-based tenure on Haida Gwaii with a total area of 134,526 hectares (including non-forested areas). Most of TFL 60 is on Graham Island with a smaller portion on northern Moresby Island and Louise Island. TFL 60 is certified under the Forest Stewardship Council's sustainable forest management standard for BC.

TFL 58 is replaceable area-based tenure that was purchased in 2016 by A&A Trading (Haida Gwaii) Ltd. The total area of the TFL is 23,933 hectares (including non-forested areas) occurring entirely on northern Moresby Island.

Forest Licence to Cut (FLTC) A87661 is a short term non-replaceable tenure with a maximum volume that was provided to Taan Forest in 2012 as part of the fulfillment of the 2007 Strategic Land Use Agreement and the 2009 Reconciliation Protocol for the management of 120,000 cubic meters/year area based tenure. A Haida Forest Tenure Agreement was signed between the Province and the CHN in 2014, and the CHN were invited to apply for a First Nations Woodland Licence over a specified area. The 58,606 hectare area is currently managed under the FLTC pending the creation of the First Nations Woodland Licence. The tenure area, as shown in Figure 1, is primarily located on the central coast of Graham Island, along with a supply area on north Moresby Island.

Table 4 shows the current apportionment and commitments of the AAC for the rest of the TSA. Also shown are the AACs for the four area-based Woodlot Licences on Haida Gwaii, with a combined total area of 1,842 hectares and a combined AAC of 9,293 cubic metres. The current AAC established in 2012 for the TSA and two TFLs (without the Woodlots) is 931,000 cubic metres.

Tenure	Holder	Total Area (hectares) includes non-forest area	Current AAC (cubic metres/year)
TFL 60	Taan Forest	134,526	340,000
TFL 58	A&A Trading (Haida Gwaii) Ltd	23,953	79,000
TSA 25: FLTC A87661	Taan Forest	58,606	120,000
TSA 25*:* Other tenures - FL A16869 - FL A16870	-Husby Forest Products Ltd	337,700 - -	392,000 (192,044) (13,632)

Tenure	Holder	Total Area (hectares) includes non-forest area	Current AAC (cubic metres/year)
- FL A75084	-A&A Trading (Haida Gwaii)	-	(7,956)
- Licence/licence to cut	Ltd	-	(81,658)
- Non-replaceable	-Dawson Harbour Logging Co	-	(14,210)
licence	-BC Timber Sales	-	(80,000)
- Community Forest	-		
Agreement	-proposed	-	(2,500)
- Forest Service Reserve			
	-		
Woodlots:			
- W1841	- Old Massett Village Council	478	2,120
- W1840	- Skidegate Band Council	422	2,000
- W0161	- Dave Younger	477	2,728
- W0162	- Gerald Lavoie	465	2,445
Totals		**556,627**	**940,293**[4]

Table 4: AAC Forest Tenure Apportionment and Commitments on Haida Gwaii

7. Forest Management

The Haida Gwaii timber supply review accounted for the Haida Gwaii land use objectives, and for several other important factors and values as described below.

Ecosystem-Based Management (EBM)

The 2007 Strategic Land Use Agreement defined EBM for Haida Gwaii as:

> "an adaptive, systematic approach to managing human activities, that seeks to ensure the co-existence of healthy, fully functioning ecosystems and human communities."

The Strategic Land Use Agreement also notes that:

> "[t]he Haida will establish the EBM Objectives in accordance with their laws, policies, customs, traditions and decision-making processes."

The Haida Gwaii Land Use Objectives Order states:

> "This Land Use Objectives Order establishes legal objectives for forest-based values to support implementation of ecosystem-based management. These objectives protect important Haida cultural values, support ecosystem integrity and provide environmental benefits by maintaining the diversity and abundance of organisms on Haida Gwaii. Human well-being is maintained through policies and initiatives designed to achieve socio-economic benefits, including carbon values, and timber harvest levels that will support a viable forest industry."

The aim of Haida Stewardship Law is: '...bringing land and resource use balance to Haida Gwaii to ensure the continuity of Haida culture and a sustainable islands economy'.

The Haida Land Use Vision places emphasis on 'the well-being of the land', 'the condition of the land', and 'the natural ability of the land to function and provide'. The Haida Land Use Vision also refers to:

[4] Includes 9500 cubic metres for municipal areas in the TSA and TFL 60, and private land portions of woodlots - that are not part of the aggregate area determined by HGMC in 2012

"Yah'guudang—our respect for all living things—[which] celebrates the ways our lives and spirits are intertwined and honours the responsibility we hold to future generations."

Incorporating Haida Gwaii Land Use Objectives in the Timber Supply Review

Haida Gwaii land use objectives support EBM implementation on Haida Gwaii. The establishment of these legal objectives through the *Land Use Objectives Order* helps ensure that forest plans and practices on Haida Gwaii are consistent with the objectives. The land use objectives are accounted for in the timber supply review as required current practice. The legally established land use objectives include:

Cultural objectives for:
- Cedar Stewardship Areas
- Cultural Feature Identification
- Haida Traditional Heritage Features
- Haida Traditional Forest Features
- Western redcedar and yellow-cedar retention
- Western yew retention
- Culturally modified trees and monumental cedar.

Aquatic habitat objectives for:
- Type I fish habitat [as defined in the Order]
- Type II fish habitat [as defined in the Order]
- Active fluvial units
- Upland stream areas
- Sensitive watersheds.

Biodiversity objectives for:
- Forested swamps
- Ecological representation
- Red-listed and blue-listed ecological communities.

Wildlife objectives for:
- Black bear dens
- Marbled murrelet nesting habitat
- Northern goshawk habitat
- Great blue heron nesting habitat
- Northern saw-whet owl nesting habitat.

Forest reserve objectives for:
- Areas reserved to meet landscape level objectives.

Examples of how these objectives are incorporated into the analysis are described briefly below. Please refer to the *Data Package* for a full description of how each objective was accounted for in the timber supply review, either by excluding areas from the timber harvesting land base or by applying forest cover requirements. One example objective requires that all Class 1 Haida Traditional Heritage Features (as defined in the Order) be protected in a reserve zone with a minimum width of 500 metres, measured from the edge of the feature. (The reserve zone may be reduced if it is decided through an intergovernmental process that it is necessary and unavoidable.)

To account for these reserves in the timber supply analysis, an appropriate, corresponding area was excluded from the timber harvesting land base and was assumed to not contribute to the timber supply at any time. The reserves provide forest cover and therefore contribute to achieving biodiversity objectives.

Another example objective requires that all forest within Type I fish habitat (as defined in the Order), and all forest within two tree lengths adjacent to such habitat (plus or minus half a tree length), be protected in a reserve zone. Accordingly, for the analysis, the area of riparian reserves within each forest stand was

determined, and that area excluded from contributing to the timber harvesting land base.

For some objectives, instead of excluding area from the timber harvesting land base, a forest cover requirement was applied such that no more than a given percentage of the forest cover may be harvested at any time. For example, sensitive watersheds equal to or greater than 500 hectares require that no more than five percent of the watershed area be harvested in a five-year period; while sensitive watersheds smaller than 500 hectares require that no more than 10 percent of the watershed area be harvested in a 10-year period.

If too much timber has already been harvested in a sensitive watershed (representing an equivalent clearcut area of 20 percent or more), then no harvesting may occur until the area is adequately 'greened-up'.

In these ways, the land use objectives that help implement EBM were modelled in the spatially explicit timber supply analysis for the Haida Gwaii.

Of particular note is management and protection of monumental cedar. A new version of the Cultural Feature Identification Standards Manual was released in late October 2019. The standards were designed to implement the LUOO requirements as currently written, not to revise the LUOO. A preliminary estimate of the frequency of monumental cedar was applied in the base case. However, some uncertainties remain, including: how many cedar trees with diameters over 100-cm meet monumental cedar criteria; and how monumental cedar will be managed and harvested. In response to these uncertainties, the HGMC through the Technical Working Group will be compiling additional information and undertaking analysis to explore: (1) the likelihood that a broader range of log grades than estimated for the base case will contribute monumentals; (2) indications that younger ages classes than assumed for the base case will contain monumental cedar; (3) timber supply implications of various levels of retention of monumental trees from harvesting. Given the recent release of the new standards, these analyses are ongoing. The results will be available for the HGMC for its determination of the Haida Gwaii AAC. This issue is an example of the dynamic nature of forest management that means the base case timber supply projection described in section 10 is just one source of information for the HGMC and must be interpreted together with other relevant information, such as the sensitivity analyses discussed later in this document, and that will be completed on monumental cedar.

Other Factors Considered

In addition to land use objectives, other factors considered in the timber supply review either reduced the timber harvesting land base or were addressed through forest cover requirements such as:

- Natural disturbance reductions
- Visual quality objectives
- Community watersheds
- Terrain stability
- Wildlife habitat areas
- Hydrologic recovery
- Economic operability (see Section 11 on 'Sensitivity Analysis')
- Karst management
- Wildlife tree retention areas
- Permanent sample plots
- Recreation sites and trails
- Minimal harvestable age requirement for timber.

The first five factors listed above are described briefly below. Please refer to the *Data Package* for a full description of how each factor was excluded from the timber harvesting land base or otherwise addressed in the timber supply review.

Trees that are killed by natural disturbances and are not harvested result in non-recoverable losses in timber supply analyses. The timber supply review used forest health aerial overview survey data collected between 2006 and 2017 to estimate current and future losses from forest pests. Satellite imagery was used to assess forest impacts from winds and landslides in 2011 and 2017 to account for current and future losses from these events.

Visual quality objectives set a threshold for how much a forest can be visually altered within scenic areas (e.g. designated areas that can be seen from significant public viewpoints). The amount of alteration permitted varies by visual quality objective class ranging from preservation (no visible activities) to maximum modification (where activities are dominant). 'Visually effective green-up' is a term used to describe when forest regeneration is no longer considered visibly altered. The timber supply analysis accounted for existing visual quality objectives and estimates of when visually effective green-up can be reached thereby restraining how much forest harvesting can occur in scenic areas.

Community watersheds that have been legally designated on Haida Gwaii are those that feed domestic water use for Skidegate and Queen Charlotte which include the Honna, Jervis, Slarkedus and Tarundl watersheds. Forest activities in these watersheds must ensure that the cumulative hydrological effects do not materially adversely impact the quantity of water, timing of water flow, or human health. In the timber supply analysis, a forest cover requirement was applied where at least 80% of the entire area of community watersheds needs to be hydrologically recovered consistent with professional hydrologic assessments.

Terrain areas with a moderate or high likelihood of landslide initiation following timber harvesting or road construction have been mapped, or existing mapping was improved, using recently acquired Light Detection and Ranging (LiDAR) coverage for Haida Gwaii. The timber supply review assessed the contribution of these terrain areas to the timber harvesting land base. The timber supply review also assessed the areas of slides relative to the total area logged in these terrain areas and found the area to be small (less than one percent).

Two Wildlife Habitat Areas (WHAs) for northern goshawk with a total area of 4,905 hectares were established in 2001 and 2003 under the *Forest and Range Practices Act.* The WHAs include Post-Fledging Areas (PFAs) and Foraging Areas. The PFAs are smaller reserves within the broader WHAs generally centered on known nest sites and do not allow any forest harvesting. Consequently, the PFAs were deducted from the timber harvesting land base. The WHA Foraging Areas have forest age class requirements (e.g., at least 384 hectares must be in old forest age class of >250 years in WHA #6-001) that were modelled in the base case.

8. Timber Harvesting Land Base

Protected areas, areas set aside to support EBM and land use objectives, and others areas that do not contribute to timber supply were removed from the timber harvesting land base for Haida Gwaii as shown in Table 5. Following these deductions, some of which overlap, the total of the combined areas in the TFLs and the TSA which contribute directly to the current timber harvesting land base is 147,746 hectares about 15% percent of the total area of Haida Gwaii. This is about 18% less than the 190,907-hectare timber harvesting land base that was derived in the last timber supply review.

Table 5: Areas removed from the timber harvesting land base for Haida Gwaii *(including overlaps)*

Protected Areas, EBM-related Areas and Other Areas removed from the timber harvesting land base	**Total area removed** (hectares)
Protected areas	
• Protected areas (CHN/Federal)	145,735
• Protected areas (CHN/Provincial)	332,273

Protected Areas, EBM-related Areas and Other Areas removed from the timber harvesting land base	**Total area removed** (hectares)
Cultural	
• Heritage (e.g. Haida Traditional Heritage Features, Culturally Modified Trees, Archaeological Sites)	27,946
• Cedar Stewardship Areas	25,303
• Monumental cedar (current retention)	442
• Monumental cedar (future retention)	77,615
• Haida Traditional Forest Features (current retention)	281
• Western Yew retention (current retention)	212
• Cultural and recreation trails	1,693
Aquatic habitat	
• Active fluvial units	36,353
• Type 1 fish habitat	93,149
• Type 2 fish habitat	58,108
• Other riparian reserve zone and riparian management zone	24,143
• Forested swamps	15,331
Biodiversity	
• Red-listed ecosystems	13,567
• Blue-listed ecosystems	62,444
• Karst ecosystems	7,179
• Rare ecosystems	12,019
• Small islands	3,123
Wildlife	
• Marbled Murrelet reserves (current retention)	116
• Northern Goshawk nesting	3,661
• Saw-whet Owl nesting	730
• Black Bear denning (current retention)	62
• Wildlife habitat areas	623
• Stand level (in block) retention (also for cultural values)	85,353
Forest reserves (landscape level objectives)	
• Forest reserves (Marbled Murrelet, Rare Ecosystems)	31,201
Terrain stability and economic	
• Landslides	1,209
• Class IV Terrain	16,816
• Class V Terrain	30,987
• Low productive forest	79,652
Other	
• Surface water	64,685
• Non-forest	86,940

Protected Areas, EBM-related Areas and Other Areas removed from the timber harvesting land base	Total area removed (hectares)
• Existing roads	9,100
• Federal reserves	1,541
• Other federal (e.g. military)	1,026
• Provincial reserves/non-timber tenures	6,259
• Private (crown grants)	17,300
• Municipal	3,092
• Permanent Sample Plots	1,010

9. Forest Inventory

The forest inventory used for this timber supply review consisted of the most up to date:

- Vegetation Resource Inventory completed for all of Haida Gwaii between 2011 and 2013 for natural stands for attributes such as species, age and site index (updated to 2018)
- LiDAR Enhanced Forest Inventory for natural stands for attributes such as basal area and heights
- Silviculture records for existing managed stands.

Two types of field audits were used to assess the accuracy of the inventory:

- Mature stand audit
- Young stand monitoring.

The mature stand audit results indicated that the photo-interpreted ages matched ground samples very well; that ground-measured heights were slightly lower than the photo-interpreted inventory; and that ground-measured basal area and number of trees per hectare were substantially greater than the photo-interpreted inventory. However, due to large sampling errors, the results of the mature stand audit were not applied to the inventory or in other aspects of the analysis.

Forty-three (43) young stand monitoring plots, established in 2016, targeted stands between 15 and 50 years of age to compare, among other things, observed stand yields with those estimated from managed stand yield models. Based on the plots sampled, there was no statistically significant difference between observed and modeled manage stand yields.

The growth of young forests following timber harvesting ranges from about 5 to 10 cubic metres per hectare per year depending on ecological conditions while averaging around 8 cubic metres per hectare per year overall for Haida Gwaii.

LiDAR coverage was acquired for a significant portion of Haida Gwaii between 2015 and 2017 through various partners and projects. LiDAR was used to provide enhanced terrain stability and active fluvial unit mapping; and was also used to enhance the photo-interpreted forest inventory for attributes such as volume, basal area and height.

Based on the forest inventory, Figure 2 shows the tree species and age class distribution by volume for all forests on Haida Gwaii and for the timber harvesting land base where Y = yellow -cedar; C = western redcedar; S = spruce; H = hemlock; P = pine; and D = red alder. Most forests are in the older age classes with western redcedar and hemlock being the main species. Younger age classes are mainly comprised of hemlock and spruce with minor amounts of western redcedar.

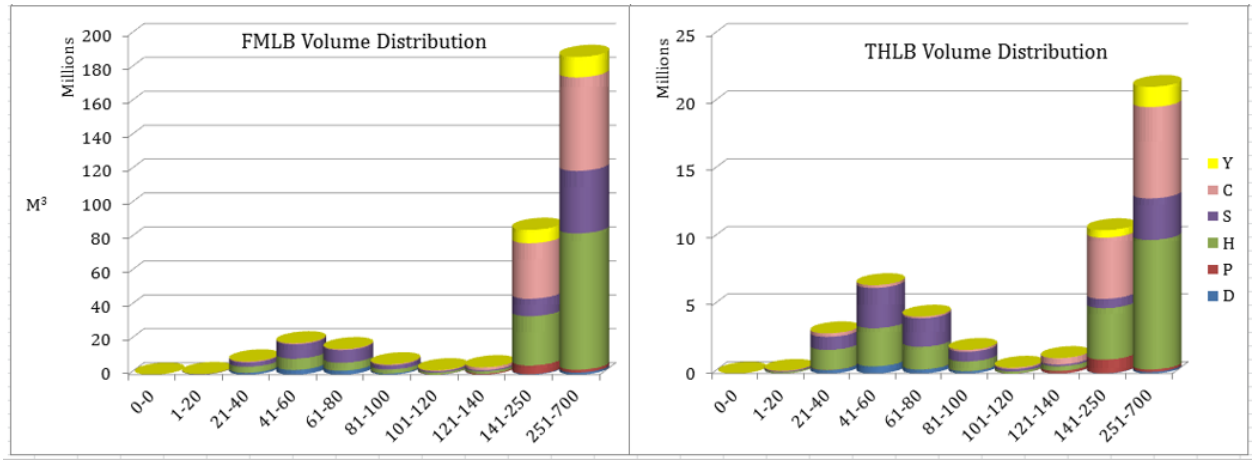

Figure 2: Haida Gwaii Forest Managed Land Base (all forests) and Timber harvesting land base (THLB) age class volume distribution by species

10. Timber Supply Analysis Results

The information the HGMC will review in making its AAC determination for Haida Gwaii includes the timber supply analysis, prepared by the Joint Technical Working Group, which models the development of the forest on the Islands through time and its response to harvesting while respecting land use objectives and other forest management requirements. This section highlights some of the important findings from the timber supply analysis. The HGMC will also be reviewing your comments on this *Public Discussion Paper* as another important consideration before making their AAC determination (see Section 13, **'Your Feedback is Needed'**).

The base case

The Haida Gwaii timber supply analysis uses the timber harvesting land base and forest management information such as EBM implementation through the land use objectives. The analysis includes a timber supply projection, aggregated from the projections prepared for the TFLs and the TSA, using the most up-to-date and best available information. Based on analysis principles such as having an even flow (or non-declining) harvest projection, a timber supply projection is provided that is called the 'base case'. The base case is not an AAC recommendation, but rather one of many potential harvest projections and other sources of information the HGMC will consider when determining the AAC, which may be greater or lesser than the harvest levels projected in the base case. Other assumptions or sources of uncertainty are examined in the timber supply analysis as described in Section 11, 'Sensitivity Analysis'.

The base case harvest projection in Figure 3 shows an even flow annual harvest level of 842,781 cubic metres for Haida Gwaii. Figure 3 also shows harvest projections for TSA and the two TFLs. These results are relevant for the Chief Forester's determinations for the TSA and TFLs. The even flow annual harvest level projection for the TSA is 425,287 cubic metres; for TFL 58 is 91,169 cubic metres; and for TFL 60 is 298,325 cubic metres.

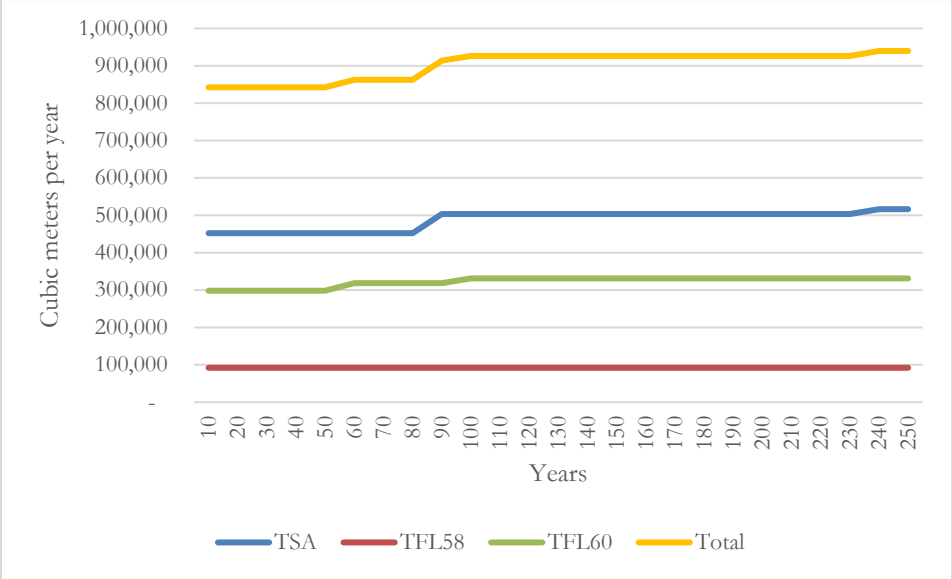

Figure 3: TSR base case harvest projection

11. Sensitivity Analysis

Over 60 sensitivity analyses were undertaken as described in the *Data Package* and *Timber Supply Analysis* reports. Types of sensitivity analysis undertaken responded to:

- Anticipated policy changes
- Reasonably foreseeable changes to markets or economic operability
- Potential changes in forest growth over time
- Potential changes in forest management strategies (e.g. rotation lengths)
- Alternative technical approaches to represent management practices and objectives.

Below is a description of some of sensitivity analysis undertaken and key findings.

Cedar sustainability

The long-term sustainability of cedar was a principle reason why the HGMC initiated this timber supply review. Aside from the high cultural value of cedar, the sustainability of western redcedar and yellow-cedar in the timber harvesting land base is a concern as the presence of cedar generally improves the economic viability of timber harvesting. Consequently, stands with higher volumes of cedar are typically targeted first for harvesting. The base case shows that timber supply from cedar stands within the timber harvesting land base will decline in all management units within Haida Gwaii from about 277,000 cubic metres per year in Year 10 to about 122,000 cubic metres in Year 40 before increasing to approximately 176,000 cubic metres annually in Year 80 (see Figure 4). The current AAC includes a maximum limit of 360,000 cubic metres per year for cedar (although at this time the only formally established partition is for the TSA - 195,000 cubic meters – since the maximum limits were being followed voluntarily in the TFLs).

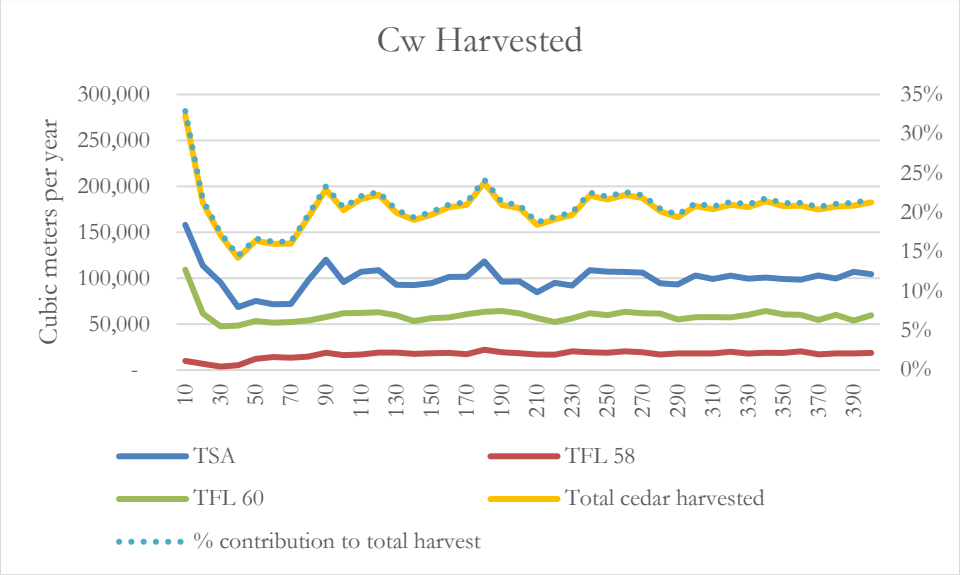

Figure 4: Base case projection of cedar volumes in the timber harvesting land base

If cedar were harvested in a manner that achieved a more or less even flow, the average amount of cedar that could be harvested annually over the entire analysis horizon would be about 146,371 cubic metres. This would allow mature/old cedar in the timber harvesting land base to last until a greater amount of second growth cedar can contribute to harvest levels. Managing cedar in this manner would result in a base case harvest levels for all species of 762,731 cubic meters per year.

Northern goshawk foraging habitat

Stads k'un *northern goshawk* was named by the Council of the Haida Nation as Haida Gwaii's national bird. Northern goshawk is a red-listed subspecies that is considered threatened by the Committee on the Status of Endangered Wildlife in Canada. A peer reviewed, published article cites the Haida Gwaii goshawk as genetically distinct from other northern goshawks. Northern goshawk nesting habitat is protected by the land use objectives with approximately 200-hectare reserves over 22 known goshawk territories. In total 3,661 hectares of known nesting habitats were excluded from the timber harvesting land base (see Table 5).

A predictive goshawk nesting territory model was used to account for 200-hectare reserves from expected goshawk territories that are not currently known. A series of sensitivity analyses explored retaining nesting reserves for predicted territories. Outside the protected areas, and the two wildlife habitat areas (noted in Section 7), northern goshawk foraging habitat is not protected. A 2015 publication concluded that territories with at least 60% suitable foraging habitat have the lowest risk of territorial abandonment based on data from Haida Gwaii and Vancouver Island. The 2018 proposed Federal *Recovery Strategy for the Northern Goshawk* also cites the importance of maintaining 65% of suitable foraging habitat per territory. A series of sensitivity analyses were undertaken to examine the timber supply implications of maintaining 65% of suitable foraging habitat for each known or predicted goshawk territory (see Table 6). This was initially applied using the Federal Recovery Plan target of 38 territories. The same analysis was applied using the 2018 Provincial Implementation Plan for northern goshawk recovery, which targets 25 territories. Lastly, a 'full occupancy' scenario assumed 67 territories as managed for nesting and foraging habitat.

	22 territories	25 territories	38 territories	67 territories
Foraging target of 65% suitable habitat and projected annual harvest level impacts relative to the base case	838,244 m^3 (0.5% reduction)	832,857 m^3 (1.2% reduction)	802,043 m^3 (4.8% reduction)	689,656 m^3 (18.2% reduction)

Table 6: Results from goshawk foraging habitat scenario

Mosquito Lake and Slatechuck watersheds

A 2015 Haida House of Assembly resolution designated Mosquito Lake watershed as an area of importance to be placed under the protection of the Council of the Haida Nation. The watershed is currently within the TSA on northern Moresby Island. A sensitivity analysis was undertaken to examine the removal of the watershed from the timber harvesting land base.

Slatechuck or *Tllgaduu* is a watershed and mountain east of the Village of Queen Charlotte whose creek, *Tllgaduu Gandlaay*, empties into Skidegate Inlet, to the ancient village of *Tllgadaaw Llnagaay.* The argillite deposits found in the watershed are the focus of a sacred quarry that the Haida Nation has traditionally used to access high quality argillite for carving. The quarry is protected by an 18-hectare federal reserve. Recent proposals for timber harvesting within the watershed outside the quarry reserve have been met with opposition by the Council of the Haida Nation. A sensitivity analysis was therefore undertaken to assess the implications of removing the watershed from the timber harvesting land base.

For Mosquito Lake there was a 19,800 m^3 or 2.3% decrease from the base case that results from a 1,845 hectare reduction from the THLB. For Slatechuck there was an 5,450 m^3 or 0.6% decrease from the base case that results from a 203 ha reduction of the THLB.

Economic operability

The 'operable area' in which licensees are able to harvest economically is subject to uncertainty. In some cases, harvesting has taken place in areas previously assumed to be inoperable, and some areas assumed operable have proved to be too expensive to harvest. If the assumed economically operable area is over-estimated, then the modelled timber supply would not be sustainable. For the base case, the timber supply review incorporated an economic operability assessment through a relative cost and marginal value model. The model incorporates costing surrogates (roads) and value surrogates (dynamic stand values) that approximate operational limitations. The relative stand values were derived from: (a) harvested stands in Haida Gwaii; and (b) log market prices. The base case assumed average log market prices when defining economic operability. Sensitivity analyses explored using high (strong) and low (weak) markets between 2008 to 2017, to assess impacts on operability and timber supply. These resulted in an approximate +/- 3.4% change in timber supply.

Another sensitivity analysis treated isolated areas, namely Sewell Inlet, Peel Inlet and Louise Island, as distinct timber supply units to assess the implications if any of these areas were partitioned in an AAC determination. Collectively these areas contribute 118,937 m^3 annually to the harvest projections. Approximately 77,624 m^3, representing 17% of the volume of the TSA and 40,550 m^3 or 14% of the volume of TFL 60.

Minimum harvestable age

For timber supply analysis, estimates are made when trees will reach a harvestable condition. Mean annual increment (MAI) is a measure of the volume grown annually. Culmination mean annual increment (CMAI) is the age at which the average productivity of a stand is at the maximum. Viewed over many stands,

harvesting at or near the age of CMAI would produce the maximum long-term timber supply. Due to harvest flow requirements, setting a timber supply model to CMAI tends to force the model to harvest a stand after CMAI. Therefore, for this factor, the minimum harvest age was set in the base case to when 95% of CMAI is achieved. Minimum harvest volumes is another factor addressed in the timber supply analysis where a minimum volume of 250 cubic metres per year was assumed in the base case; this factor can increase the minimum age before a stand is harvested beyond 95% of CMAI.

There is some uncertainty regarding what the minimum harvestable ages in reality should be. There were several sensitivity analyses that examined uncertainty in this factor. For example, one sensitivity analysis set the economic harvest rotation based on a 30 cm minimum stand diameter where the minimum age was lowered for those analysis units that met the minimum diameter before CMAI, otherwise the minimum harvest age was kept at 95% of CMAI (as per base case). This resulted a 3.5% (29,837 m^3) decrease in timber supply.

Another sensitivity analysis examined extending the rotation age to better represent natural forest age distributions on Haida Gwaii, and to increase log quality, increase carbon sequestration, and improve habitat conditions for late seral dependent wildlife. In this scenario, all existing and future managed stands had a minimum harvest age set to 150 years or maintained CMAI age if it was over 150 years. A reason for exploring this scenario is that most stands 150 years of age or older have log grade characteristics similar to old forests. This resulted in a 79% (667,837 m^3) decrease in timber supply.

Community Forest

The Province has been in negotiations with the Communities of Haida Gwaii towards the establishment of a Community Forest Agreement (CFA) from portions of the TSA. The Minister has apportioned 80,000 cubic metres of the TSA's AAC for the proposed Community Forest. The Council of the Haida Nation continues to support the establishment of an area-based Community Forest. In 2017, the Province made a formal offer of a Community Forest tenure that included a reduced volume condition and legal partnership with BC Timber Sales. While the offer has not been accepted, a sensitivity analysis was undertaken to assess the timber supply implications if that 2017 offer proceeded and the area was deleted from the TSA.

The proposed CFA area would sustain a harvest of 48,325 m^3 per year and result in a 1.6% decrease in overall timber supply on Haida Gwaii. Overall this would amount to a 13% reduction to the volume of the TSA (as the volume would be shifted into the CFA).

First Nations Woodland Licence

In 2011, the Council of the Haida Nation became the forest manager of TFL 60 and also have a commitment for an area based First Nations Woodland Licence (FNWL) tenure over the area currently within the TSA managed under Forest Licence to Cut (A87661). The Province, Council of the Haida Nation, and Taan Forest Products have been negotiating the creation of an expanded First Nations Woodland Licence that would effectively merge TFL 60 and the original area of the First Nation woodland licence invitation, currently managed under the Forest Licence to Cut. Taan Forest Products manages both tenures as if they were one already (e.g. in the submission of one Forest Stewardship Plan). A sensitivity analysis was therefore undertaken to assess the timber supply implications of merging TFL 60 and the area identified for the first nations woodland licence into one management unit. The timber supply implications potentially affect both the proposed expanded First Nations Woodland Licence and the reduced TSA, and therefore the Haida Gwaii AAC overall in terms of meeting even flow annual harvest levels for each management unit.

The proposed FNWL area would sustain a harvest of 489,025 m^3 per year and a 1.4% increase in overall timber supply on Haida Gwaii. Overall this would amount to 39% reduction to the volume of the TSA (as the volume would be shifted into the FNWL).

12. Next steps

After the public review and comment period is complete, the HGMC will review feedback and, based on the feedback, will determine if further timber supply analysis is required ahead of a determination. A determination, which considers the timber supply methods and inputs, analysis results, socio-economic assessments as well as industry and public feedback will follow.
This AAC determination, and the rationale to support it, will then be published and provided to the Chief Forester to support the Chief Forester's subsequent determination for the three management units on Haida Gwaii (TSA, TFL 58, TFL 60).

13. Your Feedback is Needed

Information provided by local and interested people is of major importance in the considerations that support AAC determinations. Your personal experience and knowledge of a particular area may be essential to a well-informed determination, particularly if something significant has been overlooked in the information under consideration. Your feedback is welcomed on any aspect of this discussion paper, on any other issue related to the timber supply, or on any other matter you feel the HGMC and the provincial Chief Forester should account for in making their AAC determinations.

If interested, you can view the timber supply data package report, timber supply analysis report, and the socio-economic analysis report at the HGMC website at www.haidagwaiimanagementcouncil.ca.

This is your opportunity to provide input on the HGMC's Haida Gwaii AAC determination as well as the Chief Forester's AAC determinations for the TSA and TFLs. There will not be a separate public consultation process for the Chief Forester's determinations.

The HGMC will be pleased to hear from you and to answer questions to help you prepare your response.

Please send your written comments via e-mail to: admin@haidagwaiimanagementcouncil.ca
or to PO Box 589 Masset, Haida Gwaii, BC V0T 1M0.

In the interest of keeping the AAC determination on schedule, it would be appreciated if we can receive your comments by the **end of the Public Review and Comment Period, on January 14, 2020.**

You may identify yourself in your response if you wish; please note that all responses may be made public under the *Freedom of Information and Protection of Privacy Act*, but if the responses are made public, personal identifiers will be removed before the responses are released.

For more information, please contact the Haida Gwaii Management Council at:
admin@haidagwaiimanagementcouncil.ca
Or, write to: **PO Box 589 Masset, Haida Gwaii, BC V0T 1M0**