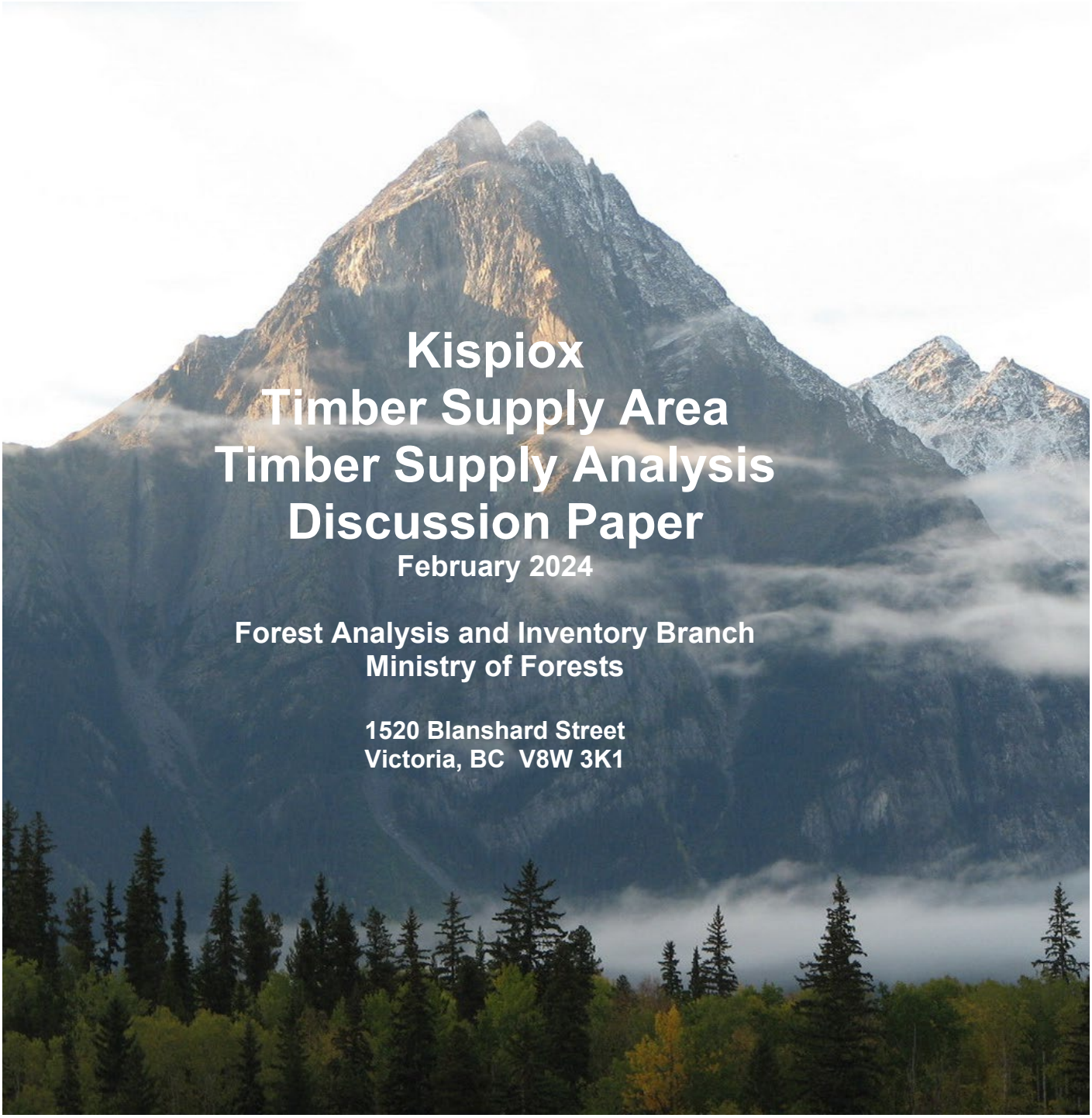

# Kispiox Timber Supply Area Timber Supply Analysis Discussion Paper

**February 2024**

**Forest Analysis and Inventory Branch**
**Ministry of Forests**

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**Victoria, BC V8W 3K1**

BRITISH COLUMBIA | Ministry of Forests

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## Introduction

The British Columbia (BC) Ministry of Forests (the "Ministry") regularly reviews the timber supply[a] for all timber supply areas[b] (TSA) and tree farm licences[c] (TFL) in the province. This review examines the impacts of current legal requirements and demonstrated forest management practices on the timber supply, economy, environment, and social conditions of the local area and province. Information gathered in this review will be used by the chief forester when determining a new allowable annual cut[d] (AAC) for the Kispiox TSA.

According to Section 8 of the *Forest Act* the chief forester must determine an AAC for each TSA and TFL in the Province of BC at least once every 10 years. If information indicates that the AAC is not likely to change the chief forester may postpone a determination for a further five years, making the total possible time between AAC determinations 15 years.

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;
- support the chief forester's AAC determination; and,
- identify information to be improved for future timber supply reviews.

This *Discussion Paper* provides a summary of the results of the timber supply analysis for the timber supply review of the Kispiox TSA. Details about the data and assumptions used in the analysis were provided in the *Kispiox TSA Timber Supply Review Data Package* (February 2021).

Further details regarding the description of the updated technical information (as described in the *Data Package*) are available on request from the Ministry's Forest Analysis and Inventory Branch.

The timber supply analysis presented in this *Discussion Paper* should be viewed as a "work in progress". Before the chief forester's AAC determination for the TSA, the analysis in this *Discussion Paper* will be reassessed as a result of input received and if necessary further analysis will be completed.

The chief forester does not have the legal authority to establish or modify land use objectives. Consequently, timber supply reviews undertaken in support of AAC determinations are based on current resource management objectives that have been formalized by government. However, the information compiled to support this timber supply review can be made available to support land use planning activities outside of the timber supply review process. If resource management objectives and practices change, these changes will be reflected in future timber supply reviews.

[a]**Timber supply**
*Timber supply is the amount of timber available for harvesting over a specified period of time.*

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

[c]**Tree farm licences (TFLs)**
*Tree farm licences are tenures that grant exclusive rights to harvest timber and manage forests in a specific area; may include private land.*

[d]**Allowable annual cut (AAC)**
*Allowable annual cut is the maximum volume of timber available for harvesting each year from a specified area of land, usually expressed as cubic metres of wood.*

## Timber supply review in the Kispiox TSA

On January 1, 2008, the AAC for the Kispiox TSA was set at 977 000 cubic metres, of this 177 000 cubic metres was partitioned to geographically remote areas of the TSA. Then, on March 31, 2009, the Cranberry TSA was consolidated with the Kispiox TSA and combined for a new AAC of 1 087 000 cubic metres.

In February 2021, a *Data Package* documenting the data and forest management assumptions to be used in this timber supply analysis was released for public review and to assist with First Nations consultation. This *Discussion Paper* is released in order to provide an overview of the TSR analysis and to highlight the key findings for the Kispiox TSA. Before setting a new AAC, the chief forester will review all relevant information, including the results of the timber supply analysis and input from government agencies, First Nations, the public, and licensees. Following this review, the chief forester's determination will be outlined in a rationale statement that will be publicly available.

The actual AAC that is determined by the chief forester during this TSR may differ from the harvest projections, including the base case, presented in this *Discussion Paper* as the chief forester must consider a wide range of information, some of which is not quantifiable. Ultimately, the chief forester's AAC determination is an independent, professional judgment based on the legal requirements set out in Section 8(8) of the *Forest Act.*

Once the chief forester has determined a new AAC and the TSR process is over, the Minister of Forests will apportion the AAC to the various licence types and programs as per Section 10 of the *Forest Act*. Based on the minister's apportionment, the regional executive director will establish a disposition plan that identifies how the available timber volume is assigned to the existing forest licences and, where possible, to new opportunities.

## Description of the Kispiox TSA

The Kispiox TSA, covering an area of 1.3 million hectares, is located in northwestern BC in the Skeena Region. It is administered by the Ministry's Skeena Stikine Natural Resource District ("the District") office located in Smithers. In 2009 the Cranberry TSA was amalgamated with the Kispiox TSA adding approximately 76 000 hectares to the Kispiox TSA. The Cranberry TSA was the former TFL 51 which was surrendered to the Crown in 1993. Figure 1 shows the location and extent of the Kispiox TSA.

A population of approximately 6,000 people reside in communities located along the Highway 16 and 37 corridors. Major communities in the TSA include Hazelton, New Hazelton, South Hazelton, Hagwilget, Two Mile, Gitanyow, Glen Vowell (Sik-e-dakh), Kispiox (Anspayaxw), Kitwanga, Cedarvale, and Kitseguecla.

The Kispiox TSA overlaps the traditional territories of the following First Nations: Gitxsan, Wet'suwet'en, Gitanyow, Nisga'a, Lake Babine Nation, Kitselas, and Tsetsaut Skii Km Lax Ha First Nation. The Gitxsan Nation has five villages within the TSA (Gitanmaax, Sik-e-dakh, Kispiox, Gitsegukla and Gitwangak). Wet'suwet'en and Gitanyow each have one village (Hagwilget and Gitanyow) respectively. The Nisga'a Treaty, finalized in April 2000, provides for a Nass Wildlife Area that is partly overlapped by the TSA. Cultural heritage features are abundant and include traditional use sites, major trading trails, and archaeological features.

The Kispiox TSA is in a transition zone between coastal and interior climates. Engelmann Spruce-Subalpine Fir (ESSFwv), Interior Cedar-Hemlock (ICHmc1, mc2), Coastal Western Hemlock (CWHws2), and Sub-Boreal Spruce (SBSmc2) are the major biogeoclimatic ecosystem classification (BEC) zones. Forests are dominated by hemlock and subalpine fir. Spruce (Engelmann, white, and hybrid), lodgepole pine, western redcedar, amabilis fir, and cottonwood are also present.

Topography in the TSA is mountainous, with a mix of wide and narrow forested drainages between mountain ranges. Stream density is very high. Major rivers include the Skeena, Bulkley, Babine, and Kispiox. The Hazelton communities are located near the confluence of the Skeena and Bulkley rivers.

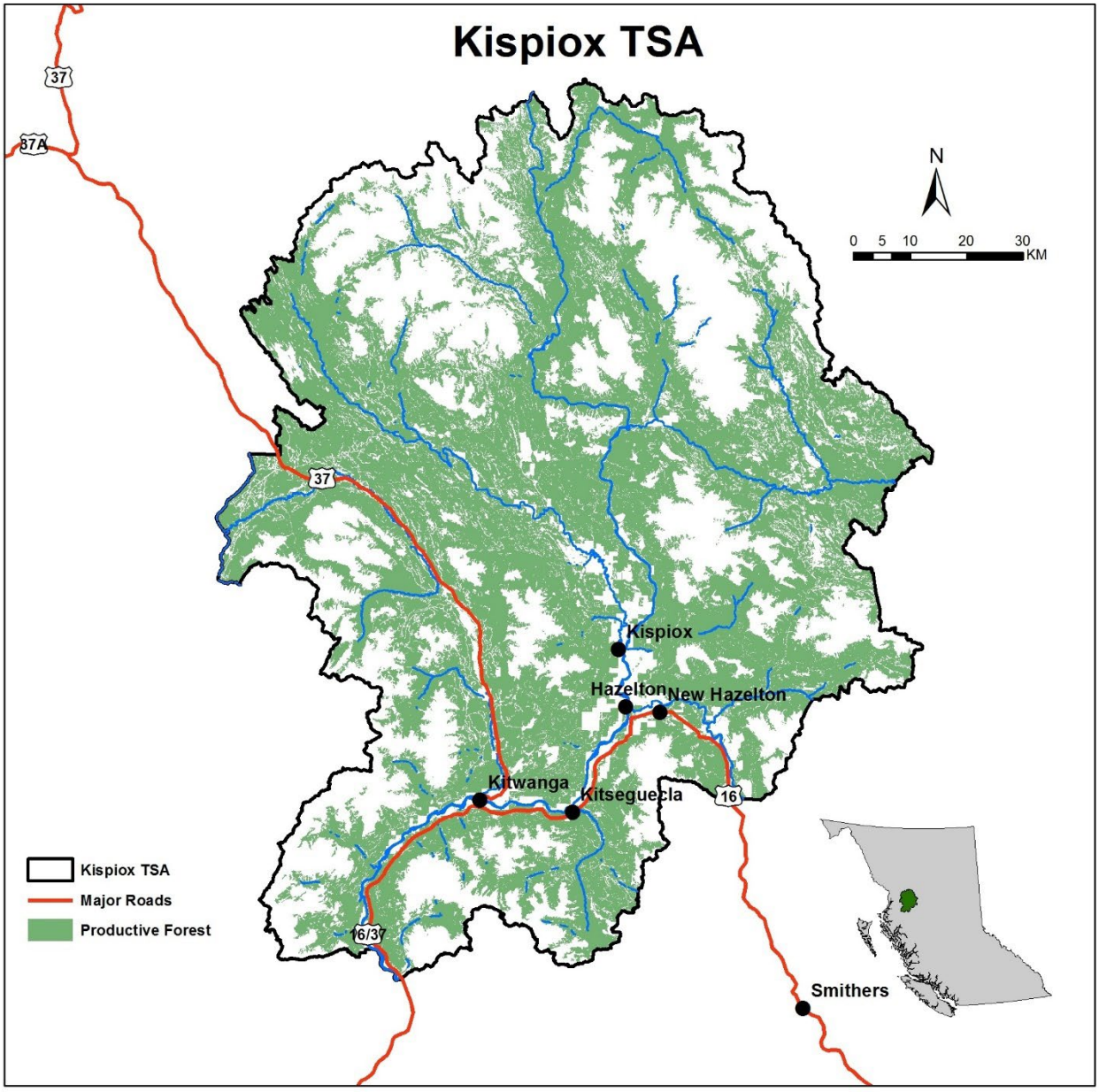


*Figure 1. Kispiox timber supply area.*

## Environmental values

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 forest lands, whether they contribute to timber supply or not, help to maintain critical habitats for many species. The timber supply analysis accounts for forest resource values such as old growth forests, visual quality, wildlife habitat, recreation features, riparian management, and protection of environmentally sensitive areas. In the Kispiox TSA, approximately 65 percent of the forested area is neither suitable nor available for timber harvesting given the various forest resource values or management requirements.

Non-timber resources and values such as biodiversity, watersheds, cultural heritage resources, fish and wildlife habitats, botanical forest products (e.g., pine mushrooms, berries), old and unique forests, scenic resources, and wilderness are all managed within the TSA.

Wildlife and fish species of regional significance include grizzly bears, moose, mule deer, mountain goat, raptors, bull trout, and sockeye salmon. Black bears are widespread, and a population of Kermode black bears extends into the western half of the TSA. Many wildlife species depend on the availability of mature and old forest ecosystems within the TSA. The Skeena River and tributaries provide important spawning habitat and migration routes for returning salmon.

## Natural resources

There is one major timber processing facility in the TSA, which is located in Kitwanga. Timber from the TSA is also processed at facilities located in Terrace, Smithers, and Burns Lake. A small amount of timber is exported.

The Kispiox TSA was generally unaffected by the recent mountain pine beetle epidemic, as mature pine-leading stands comprise less than eight percent of the harvestable area within the TSA. The most significant forest health issue is a severe outbreak of *Dothistroma* needle blight, which causes recurrent needle defoliation and has frequently led to full mortality of the pine component of young ICH and CWH plantations.

## First Nations

The traditional territories of seven First Nations wholly or partly overlap the Kispiox TSA. In some cases, the traditional territories of First Nations also overlap. These nations are the Gitxsan Nation, Gitanyow Nation, Lake Babine Nation, Nisga'a Nation, Tsetsaut Skii Km Lax Ha First Nation, Kitselas First Nation and Wet'suwet'en. The Nisga'a Nation holds a treaty, while some of the other nations are actively involved in the BC treaty process. Ministry staff work with the First Nations through engagement and economic agreements, working groups, and other non-treaty processes.

**Gitxsan Nation**

Gitxsan traditional territories occupy an area of over 2.8 million hectares in northwestern BC. Approximately 40 percent of the Gitxsan traditional territories overlap the Kispiox TSA (1 081 149 hectares). The Gitxsan traditional territories comprise 83 percent of the TSA. These territories include the Babine, Bulkley, Kispiox, and Skeena River drainages.

Of the 8,000 Gitxsan, approximately 2,500 live in five Gitxsan villages - Gitwangak, Gitsegukla, Gitanmaax, Sik-e-dakh (Glen Vowell), and Anspayaxw (Kispiox) - and two provincial municipalities - Hazelton and New Hazelton. The Gitxsan Nation is made up of four clans under which, there are 52 Wilp (house groups). Each Wilp has authority over its respective territory.

Existing and previous agreements between the Ministry and the Gitxsan Nation include the:

- 2006 Gitxsan Short Term Forestry Agreement which expired October 26, 2011:

  It provided for access to tenure, not yet realized by the Gitxsan, as well as other economic accommodations, restoration works and a pilot landscape unit planning process for the Gitseguecla watershed;

- 2017 Pilot Engagement Agreements were initiated with three Gitxsan Administrative Watersheds (Laxyip): Gitwangak, Babine, and Kispiox;

- 2018 Strategic Engagement Agreements (SEAs) were signed with five Gitxsan Laxyip: Babine, Gitwangak, Kispiox, Sustut, and Upper Nass.

The terms of these agreements include:

establishing governance structures for government-to-government relationships;

enabling consultation processes regarding land and resource decisions; and,

working collaboratively on joint initiatives, such as, resource revenue sharing, forestry tenure opportunities, forestry business opportunities, collaborative land management and environmental stewardship, and human resource capacity development.

- 2018 Strategic Forest Envelope funding for three of the Laxyip (Gitwangak, Kispiox, Babine) provided for human resource capacity development; and,
- Initiatives are currently underway to develop Forest Consultation and Revenue Sharing Agreements (FCRSAs) with all five Laxyip.

**Gitanyow Nation**

Gitanyow traditional territories occupy an area of over 600 000 hectares in northwestern BC. Approximately 35 percent of the Gitanyow traditional territories overlap the Kispiox TSA (208 587 hectares). This area is along the western boundary of the TSA in the Middle Nass and Upper Skeena Watersheds (Kitwanga and Kispiox Rivers) and represents 16 percent of the Kispiox TSA.

The Gitanyow peoples are known collectively as the Gitanyow Nation. The Gitanyow Nation is comprised of two clans under which are eight Wilp. Each Wilp has authority over its respective territory (Lax'yip). The Gitanyow Nation Lax'yip are collectively known as the Gitanyow Territory. The Gitanyow Territory has one community, Gitanyow, with a population of about 400. Approximately 500 Gitanyow live in other communities.

The *Gitanyow Huwilp Recognition and Reconciliation Agreement* was signed by the Province and the Chiefs of all eight Gitanyow Wilps on March 28, 2012, and was renewed for a five-year term in July 2016. The purpose of the Gitanyow Agreement is to establish a more collaborative government-to-government relationship and to allow the Gitanyow to explore economic opportunities. The Agreement also establishes a 'one window' approach to consultation within the Gitanyow Territory.

**Lake Babine Nation**

Lake Babine Nation (LBN) territory covers over 1.3 million hectares of northwestern BC. Approximately 10 percent of LBN territory overlaps the Kispiox TSA. LBN territory represents 11 percent (142 878 hectares) of the Kispiox TSA in the eastern portion of the TSA.

The total LBN population is approximately 2,600, the majority of which live in the three main communities of Fort Babine, Tachet, and Burns Lake. LBN currently have an Interim Forestry Agreement, and an Incremental Treaty Agreement with the Province of BC.

**Nisga'a Nation**

The Nisga'a Treaty area covers over 2.6 million hectares of northwestern BC. The Nisga'a Treaty includes provisions for a Nass Wildlife Area, which is partly overlapped by the Kispiox TSA. Under the *Nisga'a Final Agreement Act*, Nisga'a citizens have the right to harvest wildlife within the Nass Wildlife Area in a manner that is consistent with the communal nature of the Nisga'a harvest for domestic purposes, and the traditional seasons of the Nisga'a harvest; and does not interfere with other authorized uses of Crown land.

Approximately four percent of the areas subject to the Nisga'a Treaty overlaps the Kispiox TSA – representing 8.5 percent (110 574 hectares) of the Kispiox TSA.

The *Nisga'a Final Agreement* came into effect May 11, 2000, and was negotiated between Canada, BC, and the Nisga'a Nation. It became the first modern day comprehensive treaty in BC. The majority of Nisga'a live in communities along the Nass River, with a population of approximately 6,000.

**Tsetsaut Skii km Lax Ha (TSKLH) Nation**

Tsetsaut Skii km Lax Ha traditional territories cover over 1.9 million hectares of northwestern BC. Approximately 1.4 percent of their traditional territories are overlapped by the Kispiox TSA. Tsetsaut Skii km Lax Ha traditional territories represent just under two percent (25 144 hectares) of the Kispiox TSA.

Tsetsaut Skii km Lax Ha Nation is engaged in discussions associated with land and resource use within its asserted traditional territories outside of the BC treaty process. They have an approximate population of 30.

**Kitselas Nation**

Kitselas traditional territory covers over 800 000 hectares of northwestern BC. Approximately two percent of the Kitselas traditional territory is overlapped by the Kispiox TSA. Kitselas traditional territory represents roughly 1.5 percent (19 534 hectares) of the Kispiox TSA and is in the southwestern corner of the TSA.

Kitselas traditional territory stretches from the Pacific Ocean 200 kilometres inland to the Skeena River Valley. The traditional territory surrounds the City of Terrace and the Skeena River. Their total population is approximately 700 with most of the people living in three communities: Gitaus, Kulspai, and Endadoon.

BC and Kitselas Nation signed a three-year Consultation Agreement with all NRS agencies in February 2017. Implementation began on July 1, 2018, and applies to all NRS agencies. BC and Kitselas Nation are in the final stages of Treaty negotiations.

**Wet'suwet'en**

Wet'suwet'en traditional territory covers over 2.0 million hectares of northwestern BC. Approximately 0.2 percent of the Wet'suwet'en traditional territory is overlapped by the Kispiox TSA. Wet'suwet'en traditional territory represents less than one percent (3984 hectares) of the Kispiox TSA.

Wet'suwet'en traditional territory lies within the southeastern edge of the Kispiox TSA. Of note, the village of Hagwilget (population of 200), within the Kispiox TSA, is a Wet'suwet'en village, which lies within Gitxsan territory. The Wet'suwet'en population is approximately 3,500.

## Engagement and consultation with First Nations

The Province is working to engage First Nations throughout this TSR process, from initiation of data gathering to the time the AAC decision is made by the chief forester.

Issues communicated by First Nations in both this and previous TSRs have been and will continue to be documented. They will either be addressed by the Ministry or redirected to appropriate staff in other agencies / ministries. At the end of the TSR process, issues and how they were resolved will be included in the consultation record prepared for the chief forester. A summary of First Nations' concerns will be presented in the chief forester's rationale supporting the AAC determination.

Pre-consultation engagement with First Nations began in November 2016 with letters sent from the chief forester to all First Nations whose traditional territories overlap the Kispiox TSA. Commencement of formal consultation started when the *Data Package* was released in February 2021. The *Data Package* identified the best available information on the resource inventories and assumptions regarding management practices within the TSA that will be used in the timber supply analysis. The formal review period for the *Data Package* was 60-days.

This *Discussion Paper* contains the results of the timber supply analysis for the TSA. It includes a base case timber supply forecast and sensitivity analyses where there is uncertainty regarding the data, forest management practices, and modelling assumptions. The Ministry now invites comments and questions on the results of the analysis.

Following this second formal review period, Ministry staff will finalize the collation of the comments received and their clarification, and, if necessary, update analyses to reflect concerns. This information is presented to the chief forester for consideration when making the AAC determination. An *AAC Rationale*, documenting the AAC decision, will be provided to all First Nations with traditional territory that overlap the Kispiox TSA.

## First Nations strategic planning initiatives

**Gitanyow Planning Processes**

In 2005, a co-operative consultation and planning process involving Gitanyow Hereditary Chiefs, the Ministry of Forests (Skeena Stikine District), and Kispiox forest licensees culminated in the draft *Landscape Unit Plan for all Gitanyow Traditional Territories within the Kispiox and Cranberry Timber Supply Areas*.

Subsequently the 2006 *Gitanyow Forestry Agreement* and October 2008 *Reconciliation through Land Use Planning in Gitanyow Traditional Territory* formalized commitment for government-to-government engagement to complete strategic land-use planning within Gitanyow Lax'yip areas. The strategic planning process was led by the Ministry with independent Gitanyow and Nisga'a planning tables that culminated in two Strategic Resource Management Plans (SRMP), the Nass South SRMP and Cranberry SRMP, both endorsed as Ministerial Policy in 2012.

In March 2012 the *Gitanyow HuWilp Recognition and Reconciliation Agreement* (Gitanyow RRA) was endorsed. Embedded within the Gitanyow RRA (Schedules A and B) is the *Gitanyow Lax'yip Land Use Plan* (GLLUP) which essentially recaptures objectives, measures/indicators, and targets from the Nass South and Cranberry SRMPs.

In March 2016 the *Land Use Objectives Regulation Order: Cranberry SRMP*, legalized most Cranberry SRMP and GLLUP objectives, measures/indicators, and targets, with the exception of those for moose, mountain goat and grizzly bear.

- Strategic direction for mountain goat is accommodated in the September 2014 *Order - Ungulate Winter Range – #U-6-006* (Kispiox and Cranberry TSAs) for mountain goat.
- Strategic direction for Cranberry moose and grizzly bear is currently in development within Wildlife Habitat Area Orders. In order to plan management direction for these species, Forest Stewardship Plan holders typically elect to specify results and/or strategies made consistent with non-legal Cranberry SRMP / GLLUP direction.

All Cranberry SRMP / GLLUP direction that represents 'current management' were modelled in the TSR analysis base case.

**Gitxsan Planning Processes**

**Gitsegukla Landscape Unit Plan (GgLUP)**

The October 2006 *Gitxsan Short-Term Forestry Agreement* committed the Province to a pilot planning process in the Gitsegukla Administrative Watershed, intended to define the processes and principles for future strategic planning initiatives in Gitxsan Traditional Territory.

From Fall 2009 to August 10, 2010, Gitxsan hereditary chiefs in the Gitsegukla Watershed worked with a consultant to develop the GgLUP. Concurrently, the Province used the GgLUP to develop a draft SRMP, which in November 2010 was shared with Gitsegukla chiefs and Kispiox licensees. Projected next steps were for a broadened planning table engagement with Kispiox licensees prior to the SRMP finalization.

Although the process stalled due to Provincial and Gitxsan Treaty Society resourcing issues, the Province accepts that the GgLUP identifies interests and values the community wants protected and/or considered in land and resource decisions. As guided by collaborative engagement activities, sensitivity analyses were conducted to inform the chief forester of the implications of implementing the values represented in the GgLUP.

**Gitwangak Land Use Plan (GkLUP)**

The Province and Gitxsan hereditary chiefs are presently involved in Engagement Pilot Projects in three of nine Gitxsan Administrative Watersheds: Gitwangak, Kispiox, and Babine. The Simgiget'm Gitwangak Society, comprised of hereditary chiefs in the Gitwangak Administrative Watershed, worked with a consultant to develop the Gitwangak Land Use Plan (GkLUP), which they provided to government on April 26, 2017, in the context of potential future government-to-government negotiations.

The GkLUP provides detailed management objectives, targets, and strategies for a full spectrum of forest-based values. Because the GkLUP was developed independently with no engagement from the Province or stakeholders, the Province considers it to be neither legally binding nor policy direction. However, the Province does accept that the GkLUP acts to identify interests the community wants protected, and/or considered in land and resource decisions.

To date three Kispiox licensees (Gitxsan Forest Licence Inc., Kispiox River Timber Ltd., and Northwest BC Timber Resources Ltd.) have elected to adopt a subset of GkLUP-based objectives in their Forest Stewardship Plans, and to provide results and/or strategies made consistent with GkLUP direction. As guided by collaborative engagement activities, sensitivity analyses were conducted to inform the chief forester on the implications of implementing the values represented in the GkLUP.

## Land use planning

Land use objectives for a variety of values including, but not limited to, biodiversity, water, fish and wildlife, hydrologic integrity, timber and non-timber, visual resources, access management, recreation, and cultural heritage resources, are established for the Kispiox TSA from the following sources.

**Kispiox LRMP**

- April 1996 *Kispiox Land and Resource Management Plan* (amended March 2001);
- April 25, 1996, Order declaring the Kispiox Land and Resource Management Plan to be a Higher-Level Plan pursuant to Section 1(1) of the *Forest Practices Code of BC Act* (FPC);
- February 20, 2006, a letter from the District Manager clarified which Kispiox LRMP objectives were applicable to forest industry and thus required Forest Stewardship Plan results and/or strategies – Regarding: *Clarification regarding Kispiox Land and Resource Management Plan, Higher Level Plan Order*.

**Kispiox SRMP**

- January 2006 *Kispiox LRMP Higher Level Plan Objectives for Biodiversity, Visual Quality, and Wildlife*;
- June 1, 2006, Order to Establish Landscape Units and Objectives;
- February 1, 2006, Order to Establish Scenic Areas.

**West Babine SRMP**

- March 2004 Xsu gwin lik'l'inswx: West Babine Sustainable Resource Management Plan (amended February 2012);
- August 1, 2004, *Order to Establish the West Babine Landscape Unit and Objectives, and to vary the Atna/Shelagyote and Babine River Special Management Zone Boundaries*.

**Cranberry SRMP**

- June 1, 2012, *Cranberry Sustainable Resource Management Plan* (non-legal);
- March 3, 2016, Ministerial Order, Land Use Objectives for the *Cranberry Sustainable Resource Management Plan*, which legalized a broad selection of objectives from the Cranberry SRMP pursuant to Section 93.4 of the *Land Act*;
- March 3, 2016, Order to establish Old Growth Management Areas pursuant to Section 32 of the *Environmental Protection and Management Regulation*.

**Wildlife**

- June 20, 2007, *Order - Ungulate Winter Range – #U-6-006 (Kispiox and Cranberry TSAs)* for mountain goat (amended September 17, 2014);
- February 2019 Order - *Wildlife Habitat Area (WHA) #6-055 Grizzly Bear in Shenismike, Babine River Watershed* (also known as "Grizzly Drop");
- December 30, 2004, *FRPA Section 7 Notice - Indicators of the Amount, Distribution and Attributes of Wildlife Habitat Required for the Survival of Ungulate Species in the Cranberry TSA*;
- December 30, 2004, *FRPA Section 7 Notice - Indicators of the Amount, Distribution and Attributes of Wildlife Habitat Required for the Survival of Species at Risk in the Skeena Stikine District*.

**Visual management**

- Scenic areas were established during the *Forest Practices Code of British Columbia Act* (FPC) legal era (pre-004), and grandparented to the present era through provisions of *Forest and Range Practices Act* (FRPA) Section 180;
- A first category of Visual Quality Objectives (VQOs) were established during the FPC legal era via the West Babine SRMP and Kispiox LRMP, and grandparented to the present era through provisions of FRPA Section 181;
- A second category of VQOs were established via Government Actions Regulation (GAR) Section 17;
- A third category of VQOs were established for scenic areas that were made known by name during the FPC legal era, but where spatial mapping of the VQO extent did not occur until the FRPA legal era. Although a GAR process remains necessary for legal VQO establishment, an FPC era District Manager letter to licensees requires interim actions comparable to "Modification" VQO management.

**Other**

- June 15, 1999 Mill Creek Sensitive Area Plan, Order to Establish a Sensitive Area and Objectives;
- 2002 Botrychium Basin Sensitive Area Plan, Order to Establish a Sensitive Area and Objectives, pursuant to Section 5 of the *Forest Practices Code of BC Act*;
- May 2000 Dominion Telegraph Trail Management Plan;
- March 12, 2008 Plan for a Long-Term Sustainable Supply of Cedar, from Gitanyow Traditional Territory, for Gitanyow Cultural and Domestic Purposes.

Figure 2 shows the geographic location of the SRMPs in the Kispiox TSA.

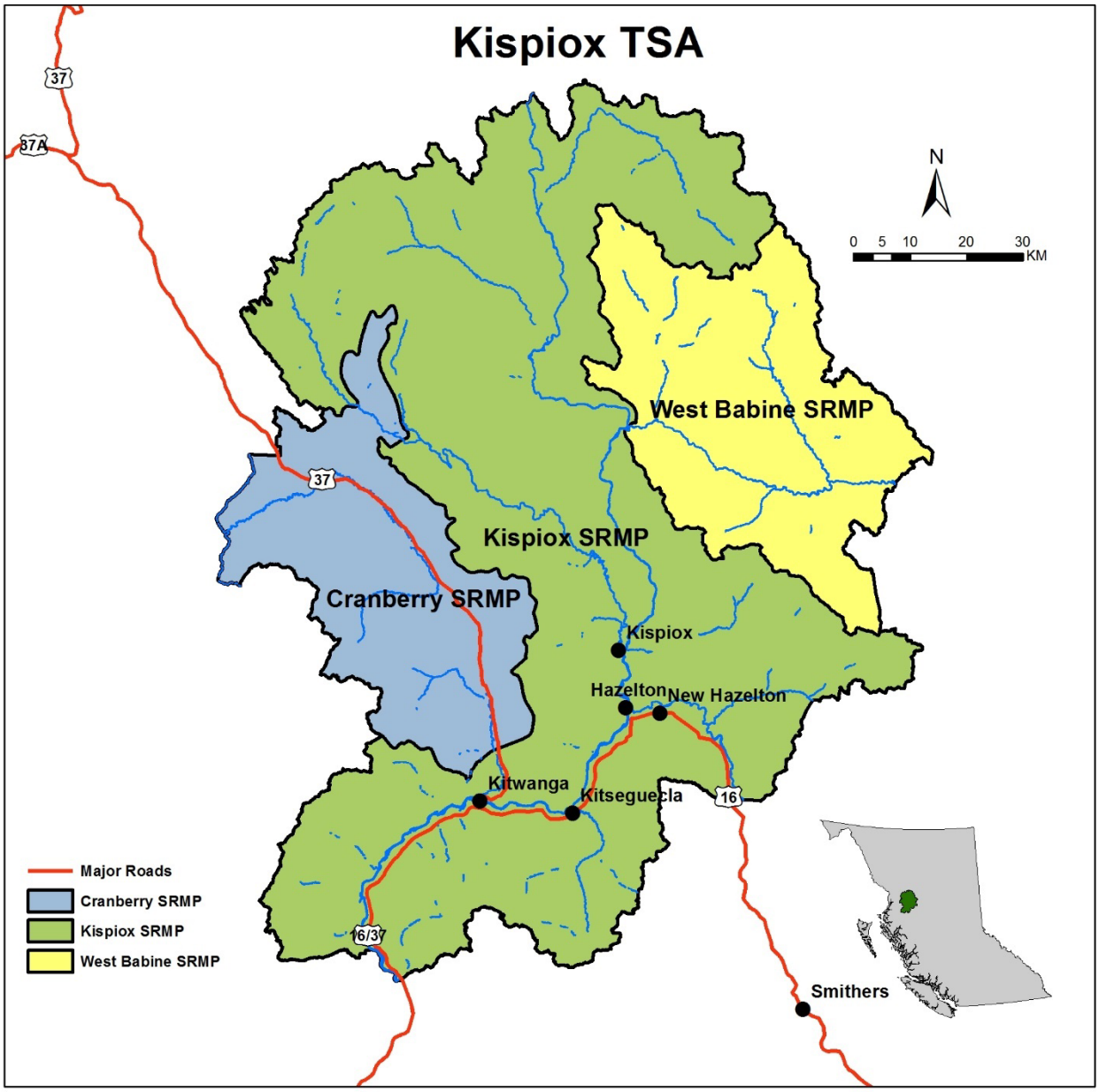


*Figure 2. Sustainable resource management plans (SRMPs) within the Kispiox TSA.*

## Forest land base

The total area within the Kispiox TSA is 1 301 307 hectares. For this AAC determination much of the land base is considered to not contribute to the TSA timber supply. Federal and private lands, treaty lands, community forests, woodlot licences, and non-forest are excluded from consideration in this timber supply analysis. The remaining forested area, referred to as the analysis forest land base[e] (AFLB), is 762 961 hectares. After accounting for additional areas where harvesting cannot or is not expected to occur, such as provincial parks, low-productivity sites, uneconomical areas, wildlife habitat, and riparian areas, about 35 percent of the AFLB is identified as suitable for timber harvesting.

This area of 265 622 hectares is referred to as the timber harvesting land base[f] (THLB). Table 1 shows details of areas that are not included within the AFLB or the THLB. Figure 3 shows the location of the AFLB and the THLB in the TSA.

[e]**Analysis forest land base (AFLB)**
*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 analysis forest does include federally-protected areas because of their contribution to biodiversity.*

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

*Table 1. Kispiox TSA land base classification summary.*

| Netdown factor | Total area (ha) | Net area excluded (ha) | Unique area excluded (ha) |
|---|---|---|---|
| **Kispiox TSA gross** | **1,301,337** | | |
| Non-provincial lands | 41,644 | 41,644 | 41,644 |
| Non-forest and non-productive | 503,240 | 503,240 | 491,040 |
| Roads, trails, landings, and transmission lines | 8,097 | 8,097 | 5,692 |
| **Analysis forest land base** | | **762,961** | |
| Provincial parks & miscellaneous reserves | 107,636 | 107,636 | 61,519 |
| Recreation sites and trails | 5,028 | 3,988 | 2,695 |
| Inoperable areas (inaccessible, uneconomic, remote) | 871,107 | 871,107 | 372,611 |
| Terrain stability and environmentally sensitive areas (ESA) | 290,119 | 287,614 | 8,983 |
| Sites with low timber growing potential | 268,173 | 268,173 | 3,673 |
| Non-merchantable forest types | 97,518 | 97,518 | 4,182 |
| Old growth management areas (OGMA) and core ecosystems | 101,276 | 101,276 | 17,035 |
| Ecosystem networks | 31,455 | 31,455 | 7,057 |
| Red- and blue -listed - ecological communities | 2,857 | 2,734 | 1,443 |
| Riparian | 33,148 | 33,148 | 4,865 |
| Floodplains | 1,586 | 1,586 | 4 |
| Wildlife habitat areas, ungulate winter ranges, Cranberry SRMP goshawk areas | 33,564 | 33,564 | 1,575 |
| Existing wildlife tree patches | 10,979 | 10,979 | 7,927 |
| Other geographically defined exclusions | 16,7705 | 167,705 | 2,130 |
| Cultural heritage resources | 4,149 | 3,935 | 1,633 |
| Permanent sample plots | 29 | 29 | 10 |
| **Timber harvesting land base** | | **265,622** | |
| Future roads, trails, landings | | 8,291 | |
| Future wildlife tree patches | | 7,775 | |
| **Future timber harvesting land base** | | **249,556** | |

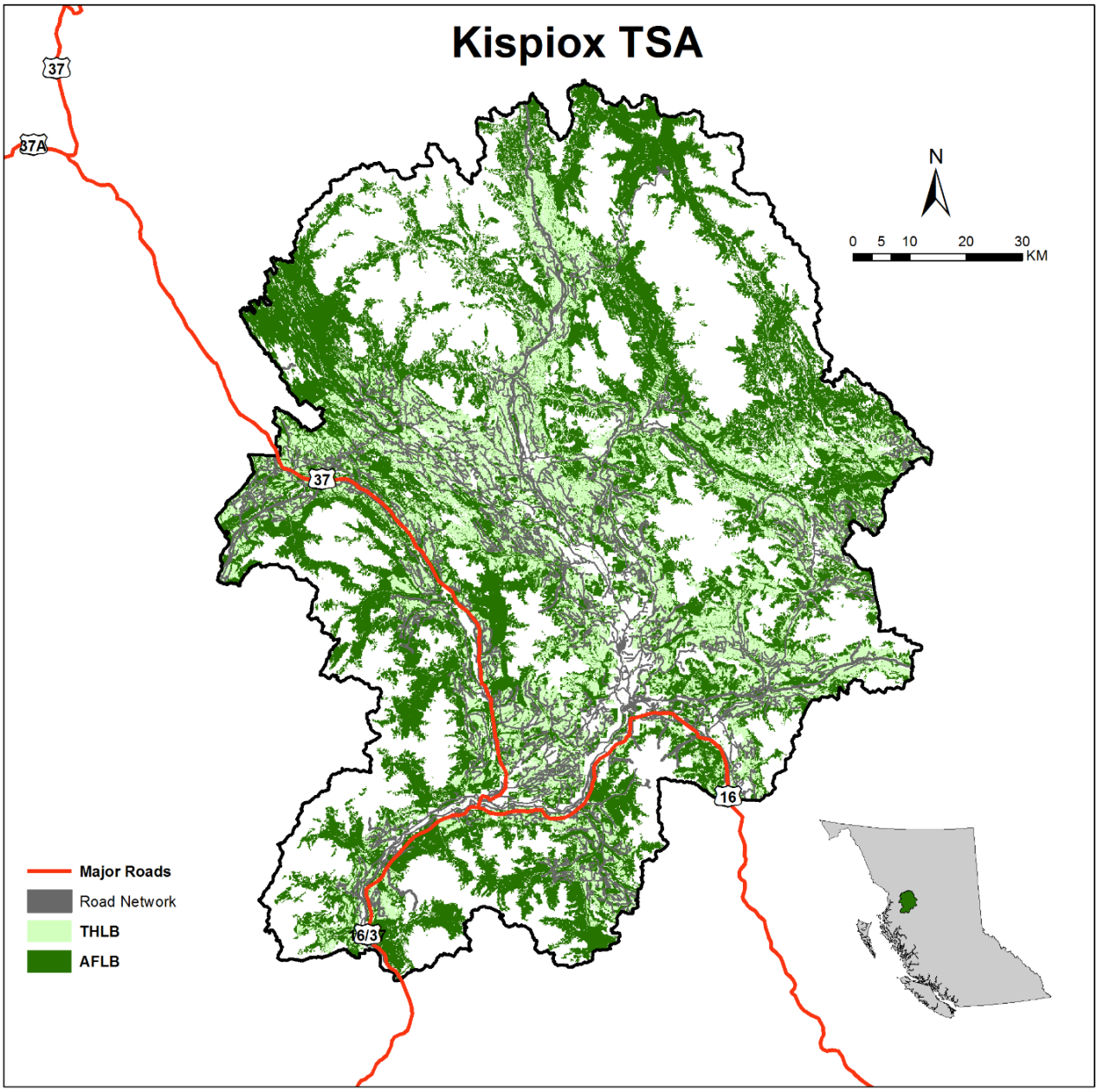


*Figure 3. Location of the timber harvesting land base and analysis forest land base – Kispiox TSA, 2022.*

The Kispiox TSA is located in a transition zone between coastal and interior climates. Figure 4 shows the distribution of the AFLB and THLB in the TSA by biogeoclimatic zone.

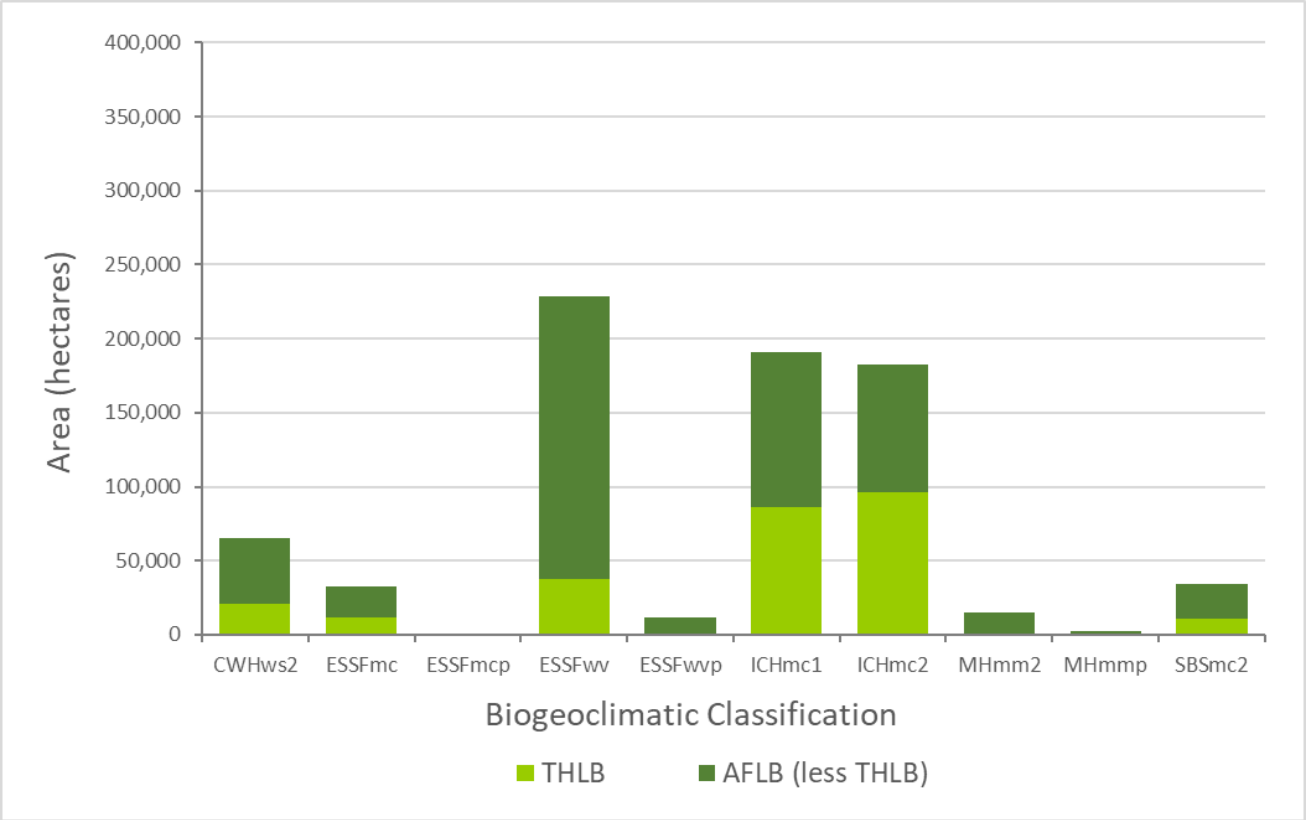


*Figure 4. Distribution of AFLB and THLB by BEC zone – Kispiox TSA, 2022.*

The forests of the Kispiox TSA were relatively unaffected by natural disturbance events such as fires and mountain pine beetle, as a result approximately 46 percent of the forested area is considered very old (> 250 years) and about 75 percent is considered old (> 140 years). Figure 5 shows the current age class distribution for forests in the AFLB and THLB.

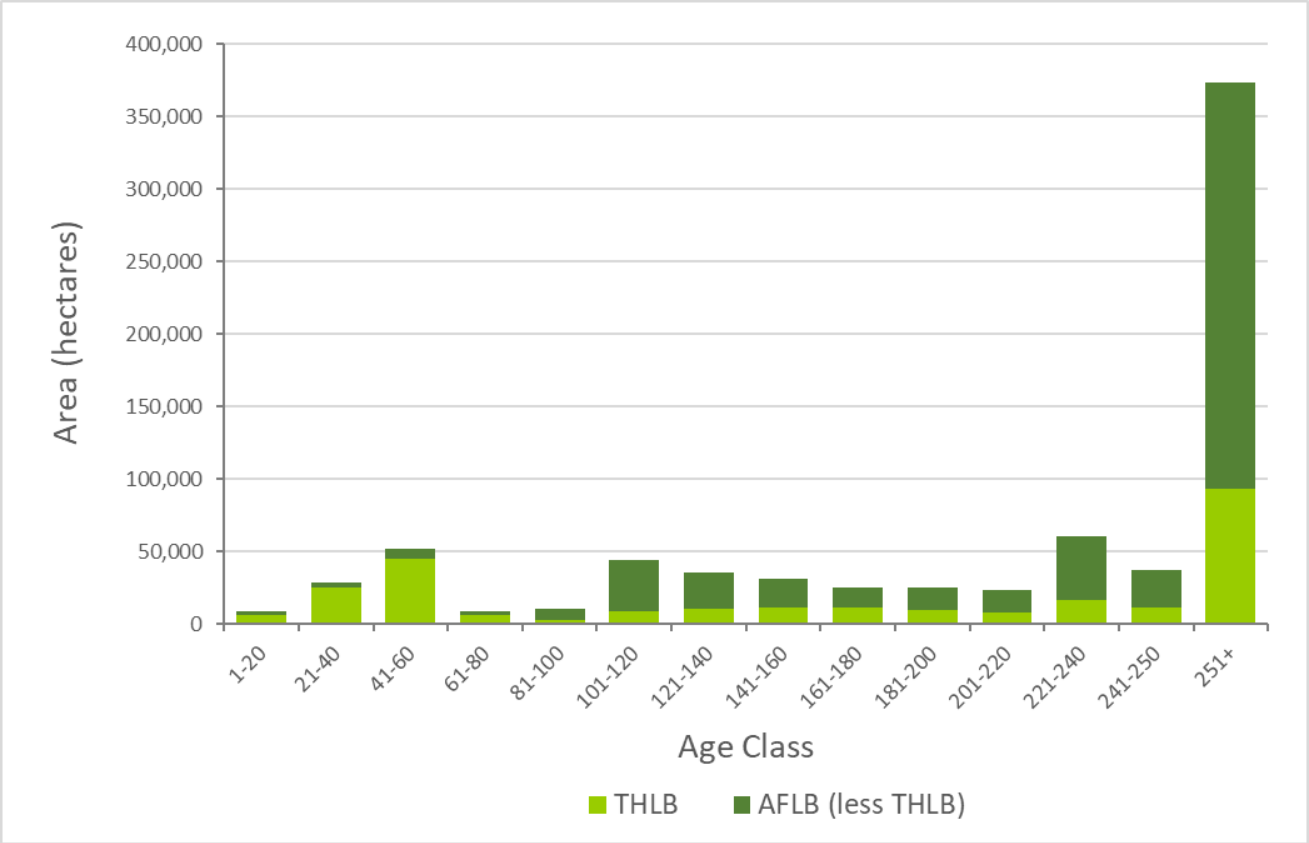


*Figure 5. Age class distribution of AFLB and THLB – Kispiox TSA, 2022.*

The age class distribution is presented spatially in Figure 6. The large amount of forested area outside of the THLB (AFLB minus THLB) in older age classes contributes to meeting most of the non-timber forest management objectives.

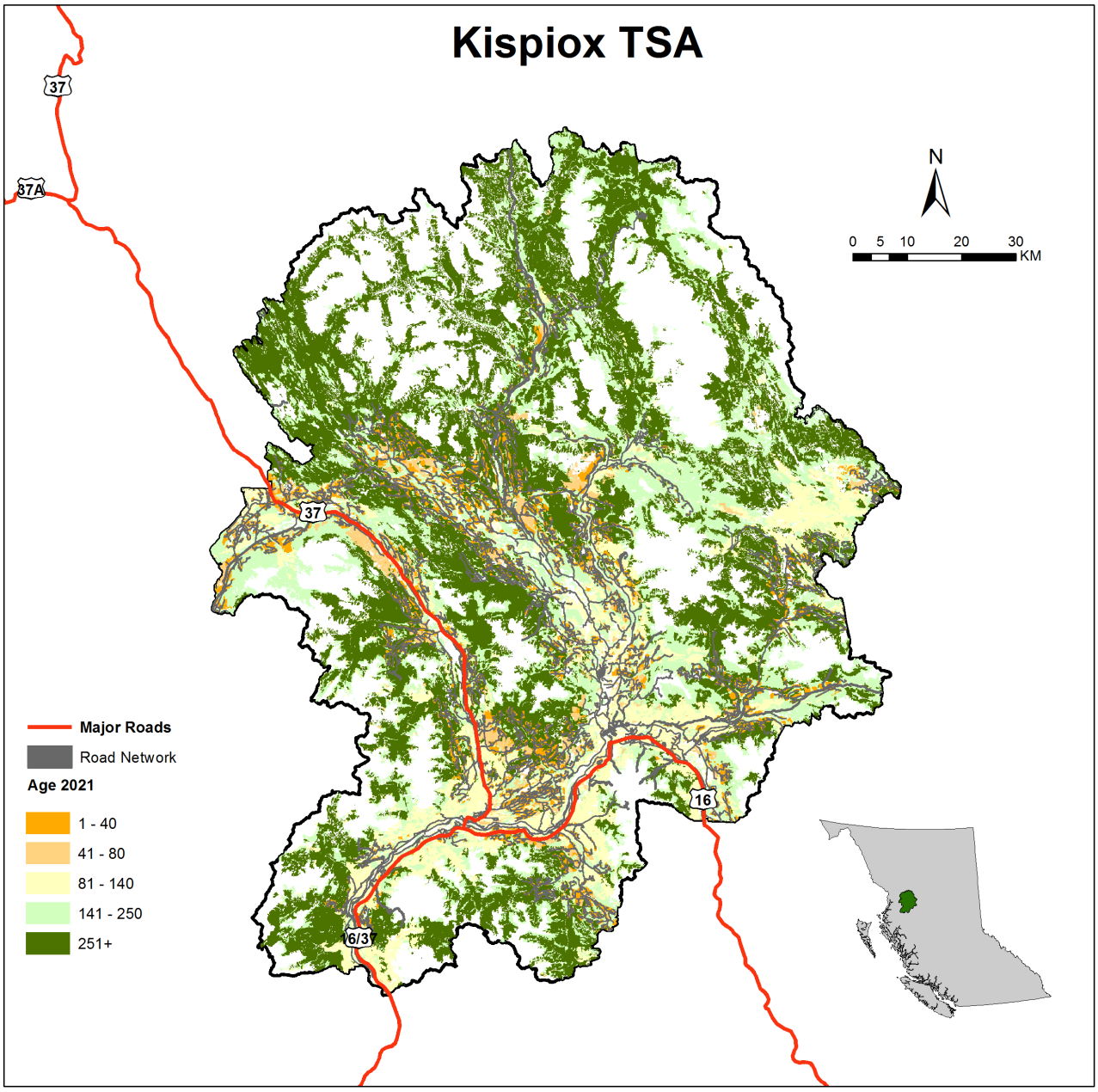


*Figure 6. Stand ages of the AFLB – Kispiox TSA, 2022.*

The forests of the Kispiox TSA are primarily composed of balsam (subalpine fir) and hemlock. Forests composed predominately of spruce, pine or deciduous (i.e., aspen and cottonwood) can also be found in the TSA. The distribution of tree species composition is presented spatially in Figure 7.

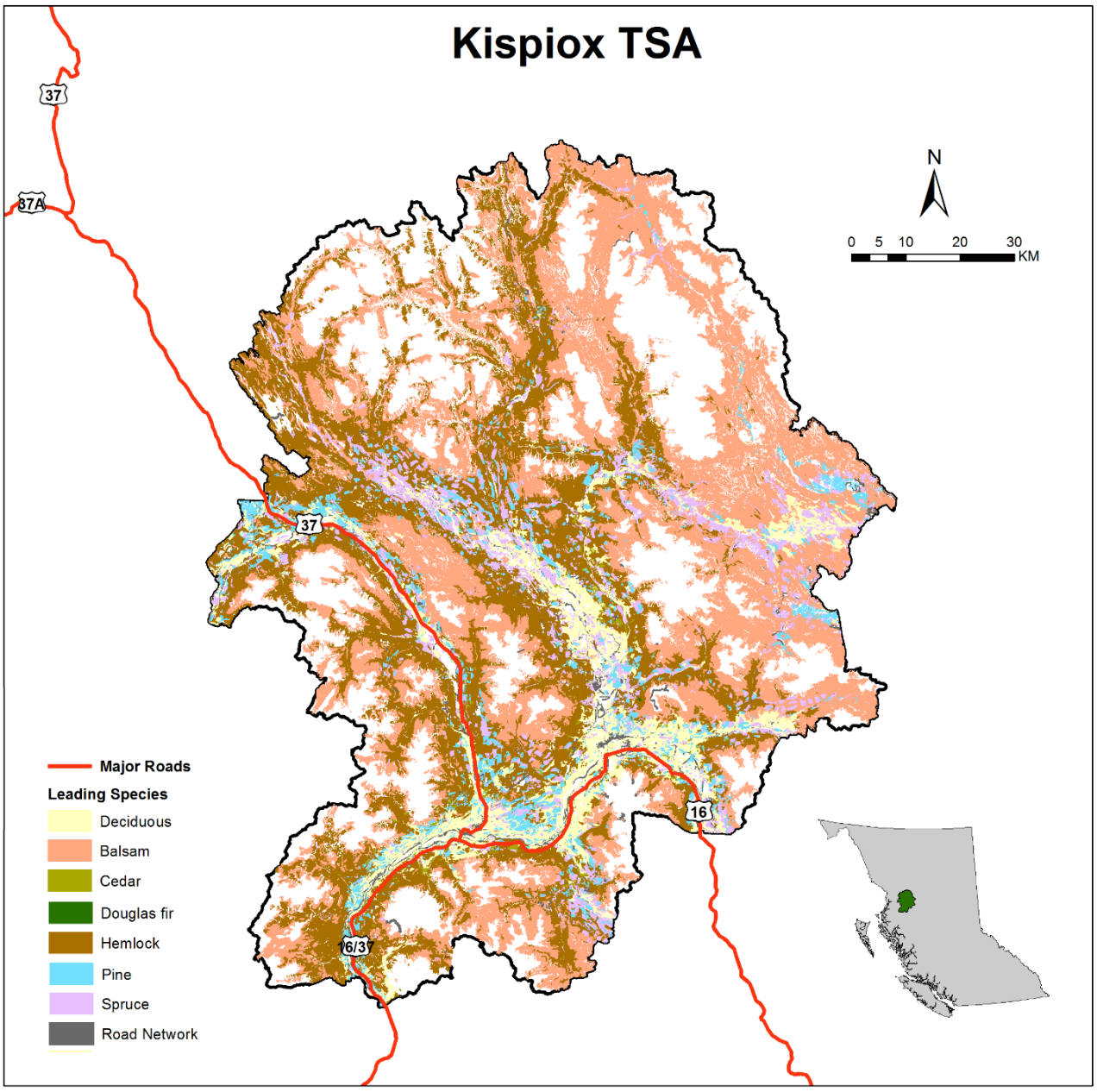


*Figure 7. Leading species of the AFLB – Kispiox TSA, 2022.*

Figures 8 and 9 depict the current area and volume distribution by dominate tree species groupings for forests in the AFLB and THLB within the Kispiox TSA.

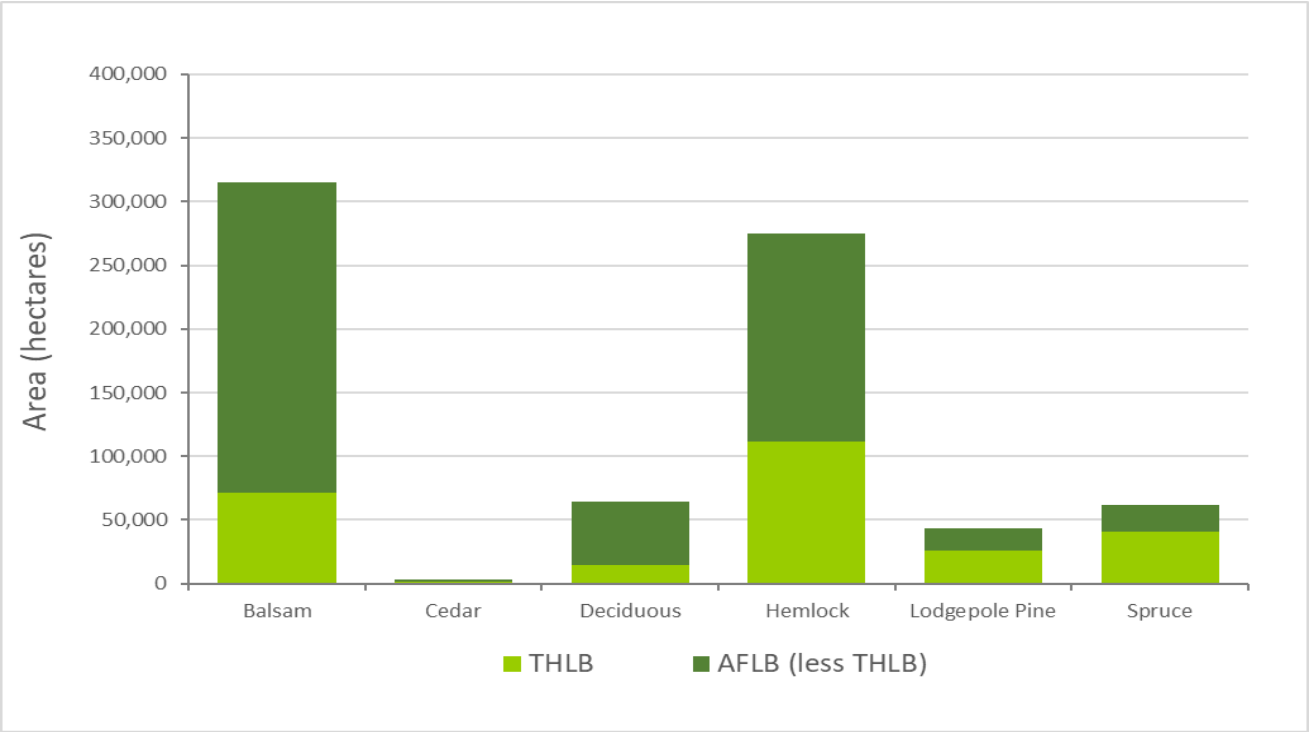


*Figure 8. Area distribution by species group – Kispiox TSA, 2022.*

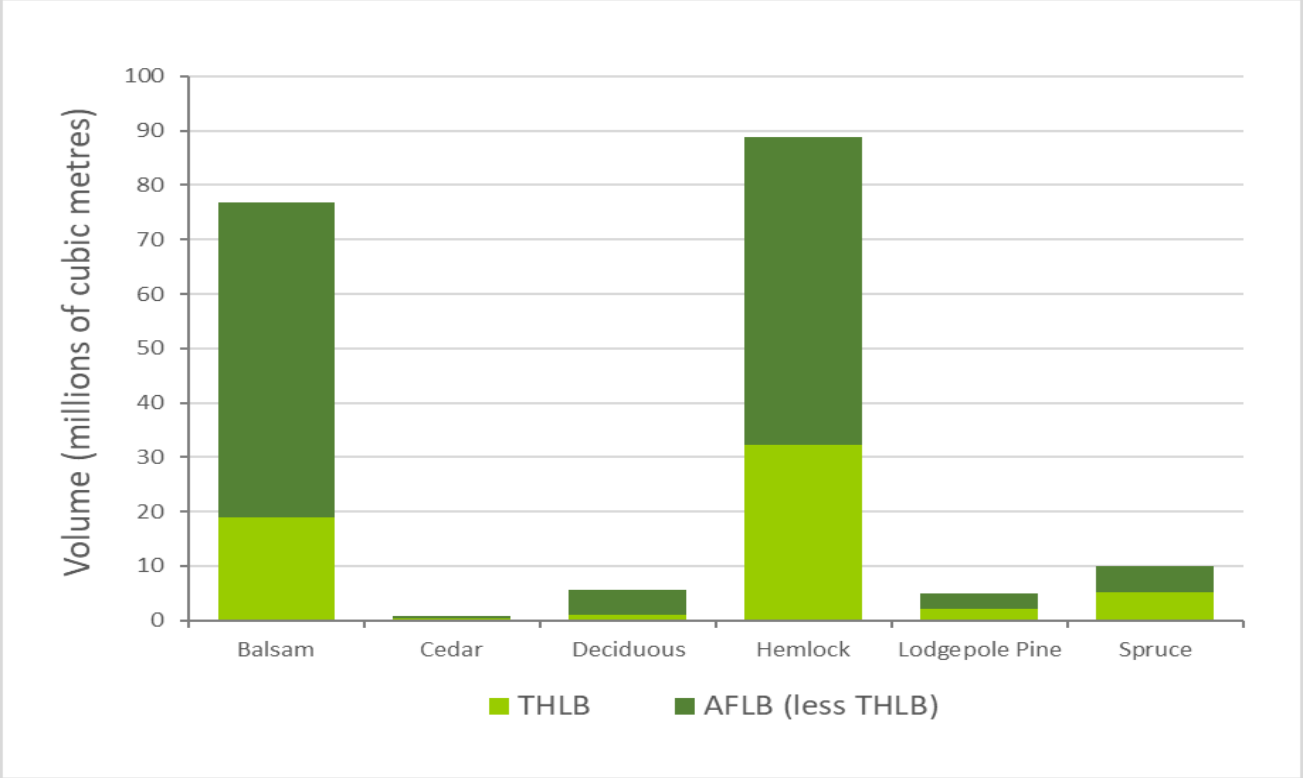


*Figure 9. Volume distribution by tree species group – Kispiox TSA, 2022.*

The productivity and growth rate of forests is measured using site index. The average site index of current naturally established forests within the THLB of the Kispiox TSA is 15.4 metres. The Provincial Site Productivity Layer (PSPL) provides site index estimates that better represent the growth of managed forests in BC. The average site index of all forests within the THLB, when projected to be in a managed state, is 18.7 metres. Figures 10 and 11 show the site index class distributions, for both the naturally established forests and projected managed forests, by AFLB and THLB within the Kispiox TSA.


*Figure 10. Area distribution by current site class –Kispiox TSA, 2022.*

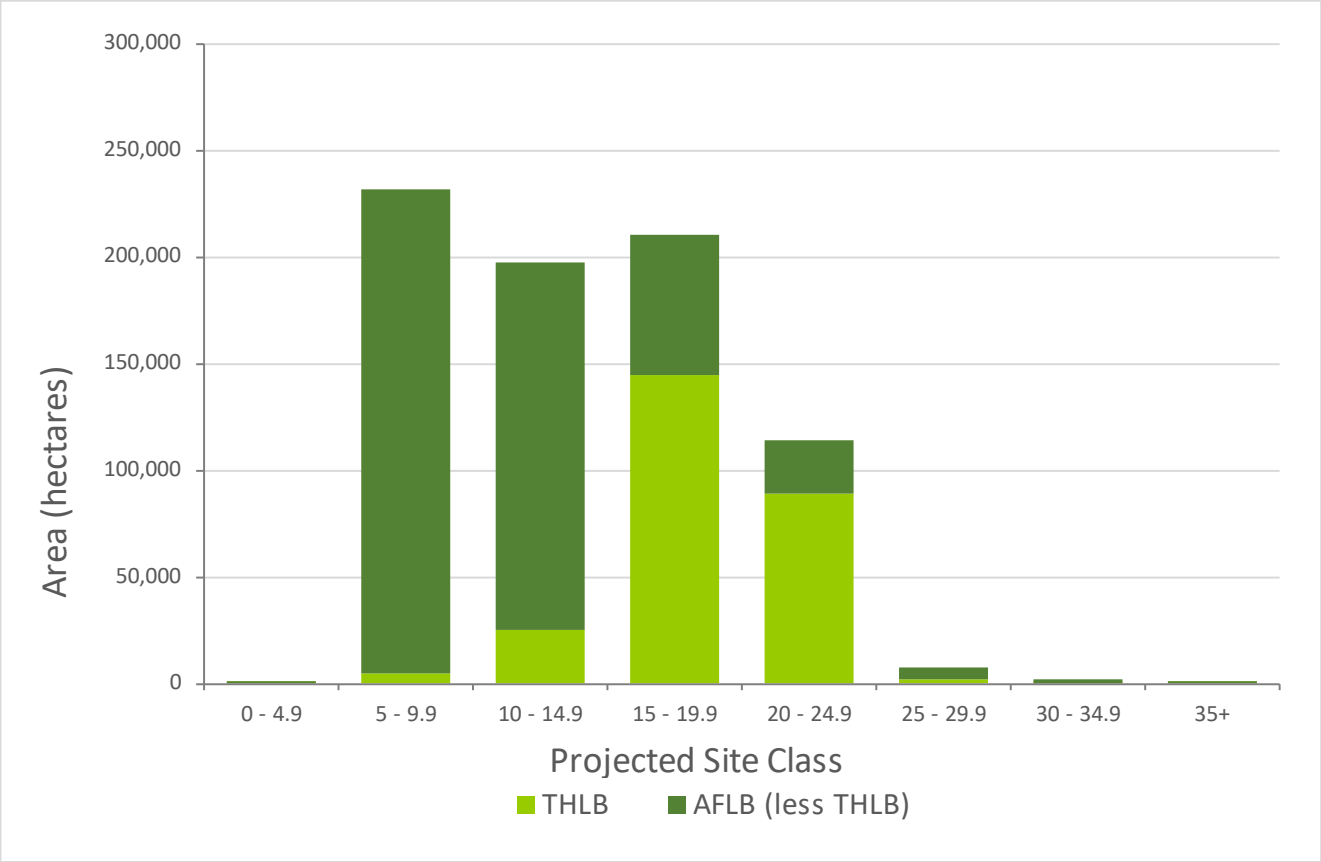


*Figure 11. Area distribution for projected site class – Kispiox TSA, 2022.*

## Recent history of the allowable annual cut and harvest performance

Effective January 1, 2008, the AAC for the Kispiox TSA was set at 977 000 cubic metres based on a THLB of 328 000 hectares. The AAC included a partition of 177 000 cubic metres attributed to geographically remote areas of the TSA which are displayed in Figure 12 below. Shortly after the AAC determination, on March 31, 2009, the Cranberry TSA was consolidated with the Kispiox TSA. The AACs for the two TSAs were combined resulting in the current AAC for the Kispiox TSA of 1 087 000 cubic metres.

*Table 2. AAC history for Kispiox TSA*

| Determination date | AAC ($m^3$) | Partition ($m^3$) |
|---|---|---|
| 1981 | 1 100 000 | |
| 1996 | 1 092 611 | |
| 2003 | 977 000 | |
| 2008 | 977 000 | 177 000 remote partition area |
| 2009 | 1 087 000 | 177 000 remote partition area |

The AAC is currently apportioned with 50 percent to replaceable forest licences, 24 percent to non-replaceable forest licences, and 23 percent to BC Timber Sales. The replaceable forest licences are awarded to Gitxsan Forest Licence Inc., Kispiox River Timber Ltd., Northwest BC Timber Resources Ltd. and 0736228 B.C. Ltd. A non-replaceable forest licence is held by Gitanyow Huwilp Society.

The average volume of timber harvested annually during the period from 2012 to 2021 was 304 877 cubic metres, or 28 percent of the AAC.

## Significant changes since the last timber supply review

Since the previous timber supply review the Cranberry TSA has been consolidated into the Kispiox TSA as Supply Block G, this added approximately 76 000 hectares to the total area of the Kispiox TSA.

The timber supply analysis supporting the previous TSR included remote areas in the THLB where harvesting has never occurred and was not anticipated to occur. The chief forester decided to establish an AAC partition that attributed 177 000 cubic metres per year to these areas to provide the opportunity for licensees to demonstrate harvest performance. No harvesting has been recorded in the remote areas since the last TSR, so they were excluded from the THLB in the current analysis.

Figure 12 shows the location of the remote areas in the Kispiox TSA.

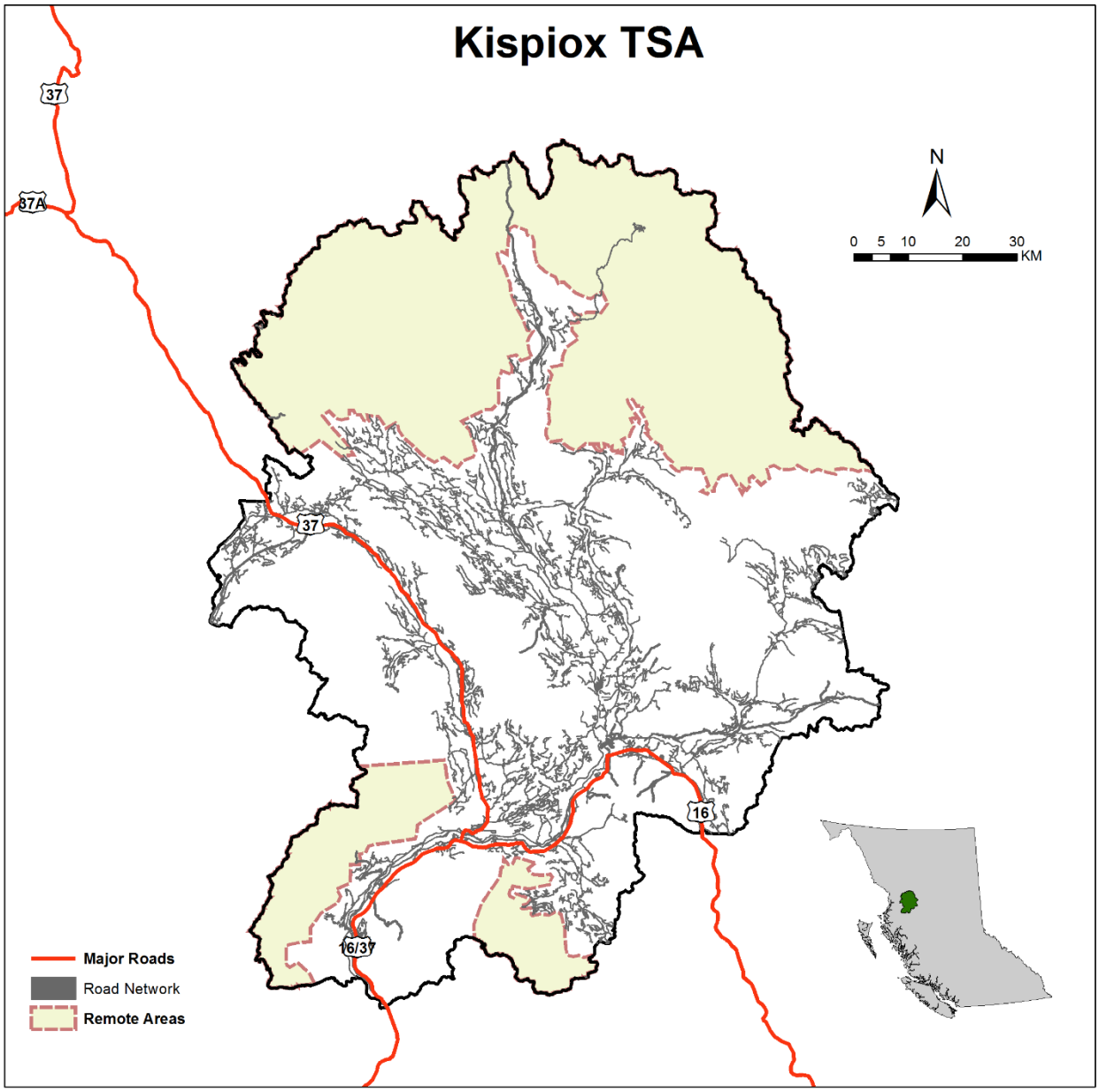


*Figure 12. Geographically remote areas - Kispiox TSA, 2022.*

Non-recoverable losses (NRL) are the second largest change since the previous analysis. In 2008, NRLs were estimated at approximately 13 000 cubic metres per year whereas they are now estimated to be approximately 185 000 cubic metres per year. This is almost entirely due to revised estimates of losses caused by the balsam bark beetle.

Figure 13 shows the volume of timber within the THLB that has been killed and, to date, has not been salvage harvested. As an annual average, less than three percent of killed timber volume has been harvested during the specified 20-year period.

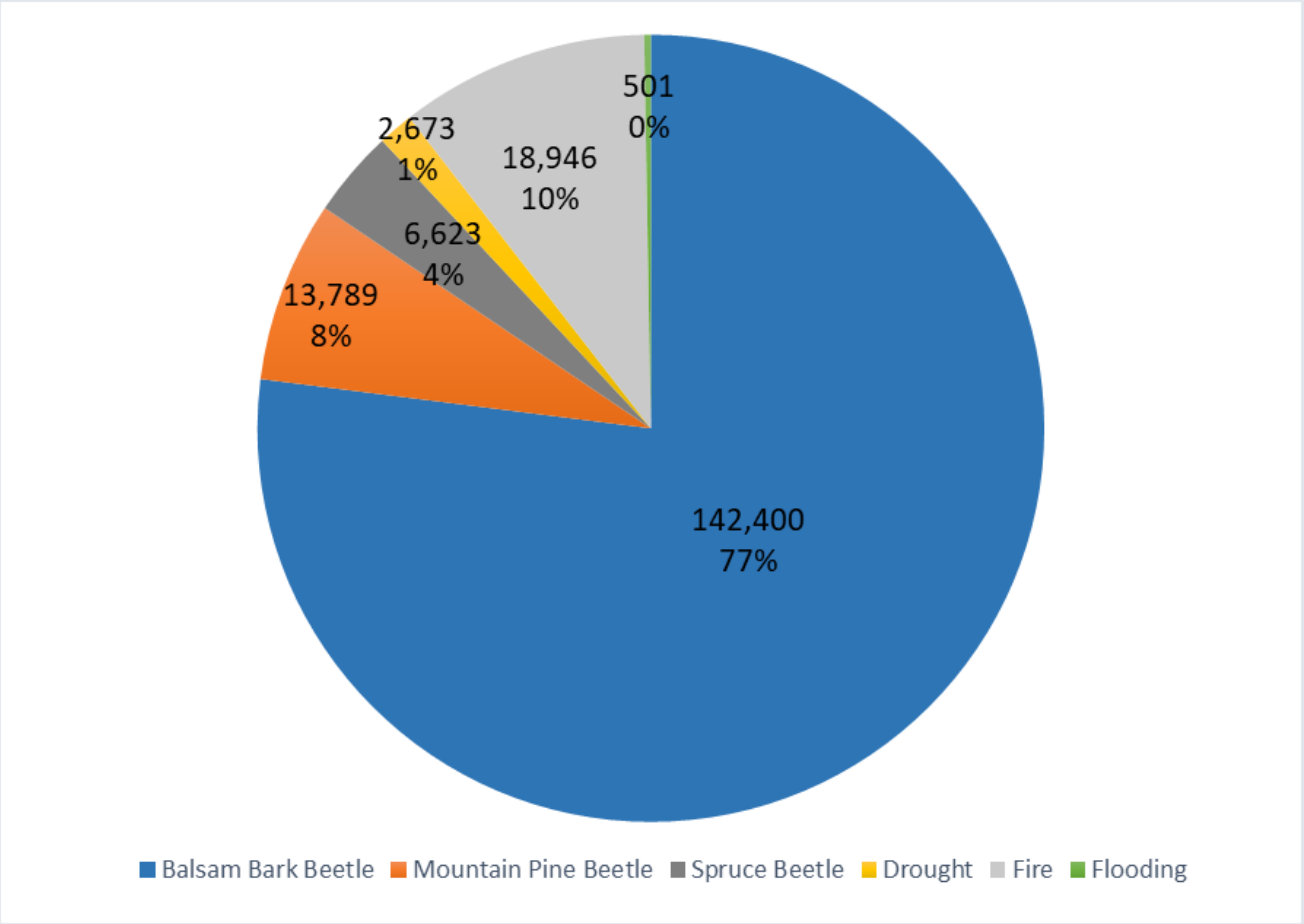


*Figure 13. Annual non-recoverable losses (cubic metres) in the Kispiox TSA, 2022.*

In 2008, forest inventory stands were aggregated to create analysis units in order to simplify the modelling process for projecting volume growth. In this analysis, volume projections were created for each individual stand where possible. Updated versions of the Ministry's growth and yield models (VDYP v7 and TIPSY v5) are used in this analysis.

## Timber supply projections

As part of the TSR, a timber supply analysis is typically carried out using three categories of information: land base inventory, timber growth and yield, and management practices. Using this information and a computer model, a series of timber supply projections are produced to reflect different starting harvest levels, rates of increase or decrease, and potential trade-offs between short- and long-term harvest levels.

From a range of possible projections, one is chosen which attempts to avoid both excessive changes from decade to decade and significant timber shortages in the future, while ensuring the long-term productivity of forest lands. This is known as the 'base case' harvest projection, and it provides a baseline harvest flow from which the chief forester can understand the dynamics of timber supply in the Kispiox TSA. The base case is designed to reflect current management practices and assumptions.

The base case is not an AAC recommendation because it represents only one of a number of possible projections and incorporates information and modelling assumptions about which there may be some uncertainty. The validity of the base case - as with all the other projections provided - depends on the validity of the data and assumptions incorporated into the computer model used to generate it.

Due to the existence of uncertainty in the timber supply analysis, additional projections are usually prepared to test the effect of changing some of the assumptions or data used in the base case. These harvest projections are referred to as sensitivity analyses. Both the base case and sensitivity analyses are prepared using a computer model that projects the future availability of timber for harvesting based on the growth of the forest and the level of harvesting, while staying within the legal land use objectives established by the provincial government. For the current analysis, the forest estate model used was the spatial timber supply model (STSM v2022) developed by the Ministry using the spatially explicit landscape ecosystem simulator (SELES).

### *The base case and alternative harvest flows*

In a timber supply analysis, the forest composition data, growth and yield projections, and forest management objectives determine the availability of timber supply and the possibilities for harvest flow (i.e., the amount of harvest available over time). Many different harvest flows are possible given harvesting assumptions and harvest flow objectives.

Figure 14 shows the 2021 base case harvest projection for the Kispiox TSA. The base case projects an initial harvest level of 654 200 cubic metres per year, this level is maintained for 160 years before rising to the long-term level of 686 600 cubic metres per year.

The base case harvest level is 40 percent below the current AAC of 1 087 000 cubic metres. However, this difference reflects the removal of remote areas from the THLB in the current analysis and the amalgamation of the Cranberry TSA with the Kispiox TSA.

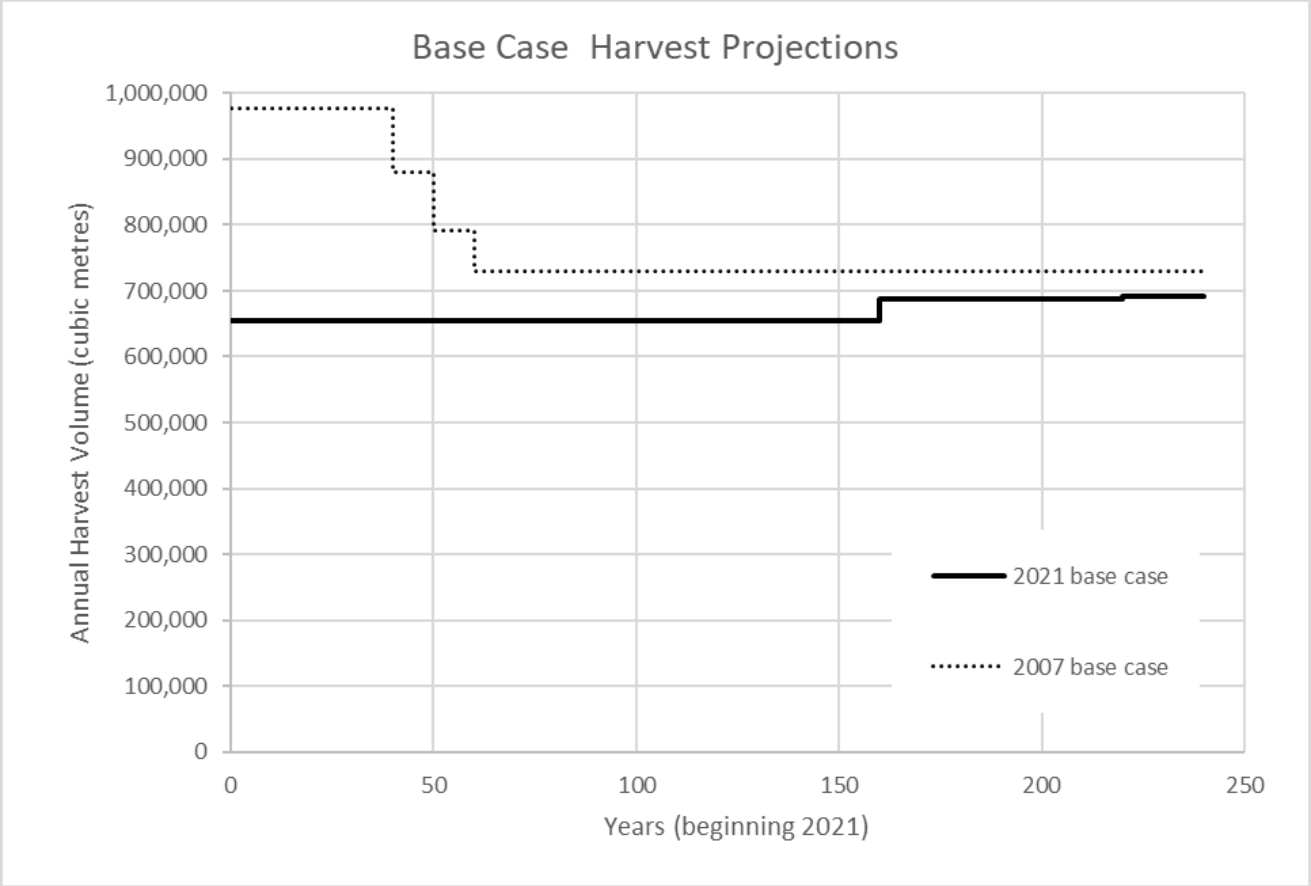


*Figure 14. Base case harvest projection – Kispiox TSA, 2022.*

The base case was developed after exploring two harvest flow options that evaluated different paths of declining harvest flows. The first alternative (Alternative 1) maintained the current AAC, adjusted for the exclusion of areas classified as remote, as long as possible. The current adjusted AAC of 910 000 can be maintained for 10 years before incremental reductions draw down timber supply to a stable long-term harvest level.

The second alternative (Alternative 2) maintained an annual harvest level of 800 000 cubic metres, approximately 11 percent below the current adjusted AAC, for 20 years before incremental reductions draw down timber supply to a stable long-term harvest level similar to Alternative 1.

The theoretical long-run sustained yield (LRSY) for the Kispiox TSA (excluding remote areas) is 904 500 cubic metres per year, that is 38 percent higher than the base case initial harvest level[1].

An elevated initial harvest and declining harvest flow are options intended to facilitate the transition of the forest industry to a future sustainable timber supply level that is significantly lower than current harvest levels. Since the average harvest for the past five years of 400 000 cubic metres per year is already substantially below the long-term harvest level of both alternatives an elevated initial harvest level is not necessary. Therefore, the base case was developed using an even-flow throughout the early periods of the projection to best represent current operational conditions.

[1] Theoretical long-run sustained yield is the sum of the managed stand mean annual increment at culmination age (age at which maximum mean annual increment is achieved) for each hectare in the timber harvesting land base.

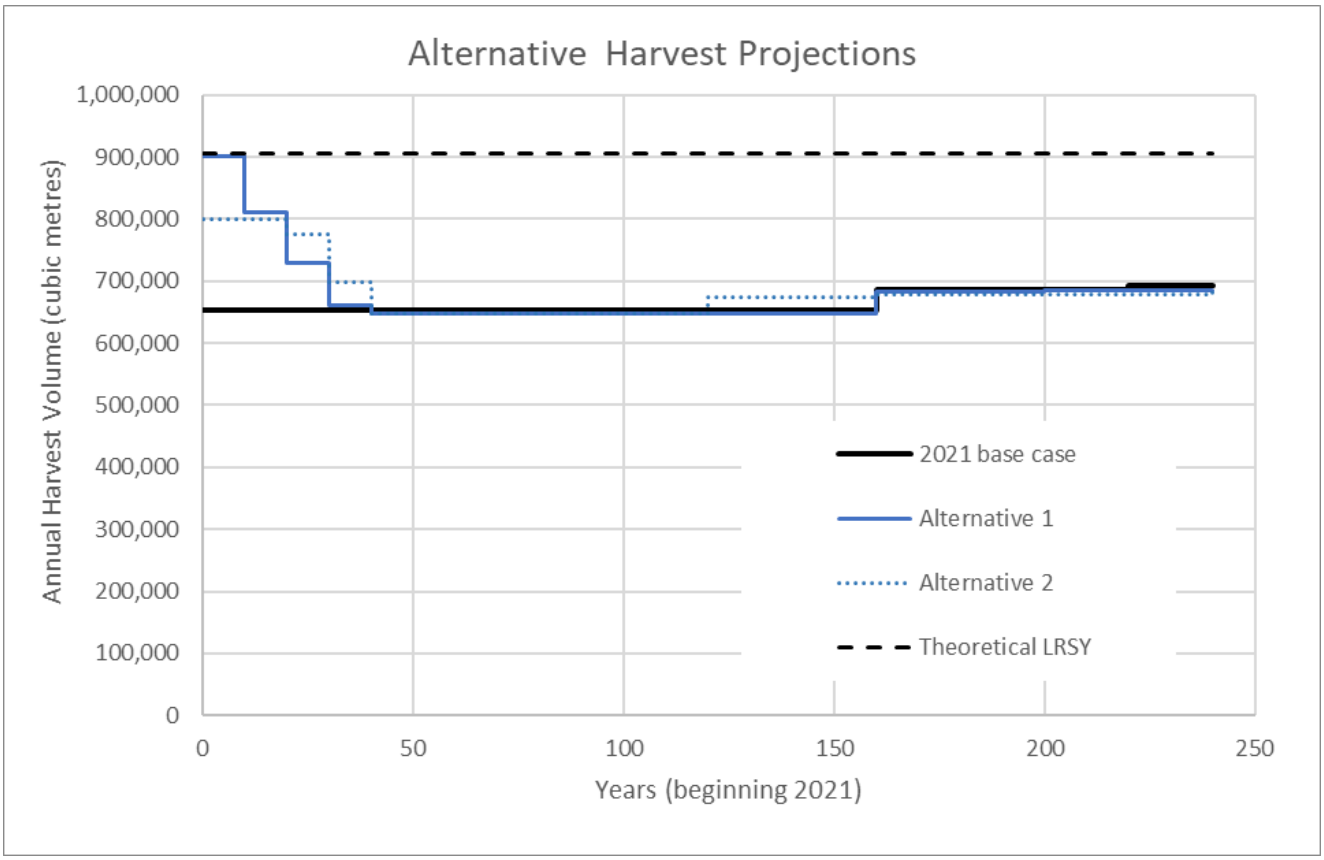


*Figure 15. Alternative harvest projection – Kispiox TSA, 2022.*

### *Attributes of the base case*

Figure 16 shows that the total volume of growing stock today is about 60 million cubic metres. The growing stock declines for the first five decades before stabilizing at the long-term level of 34 million cubic metres. Figure 16 also shows the projection of the merchantable growing stock (stands meeting the minimum merchantability criteria). The merchantable growing stock declines for the first eight decades from about 57 million cubic metres to about 20 million cubic metres and remains stable at that level for the remainder of the projection horizon.

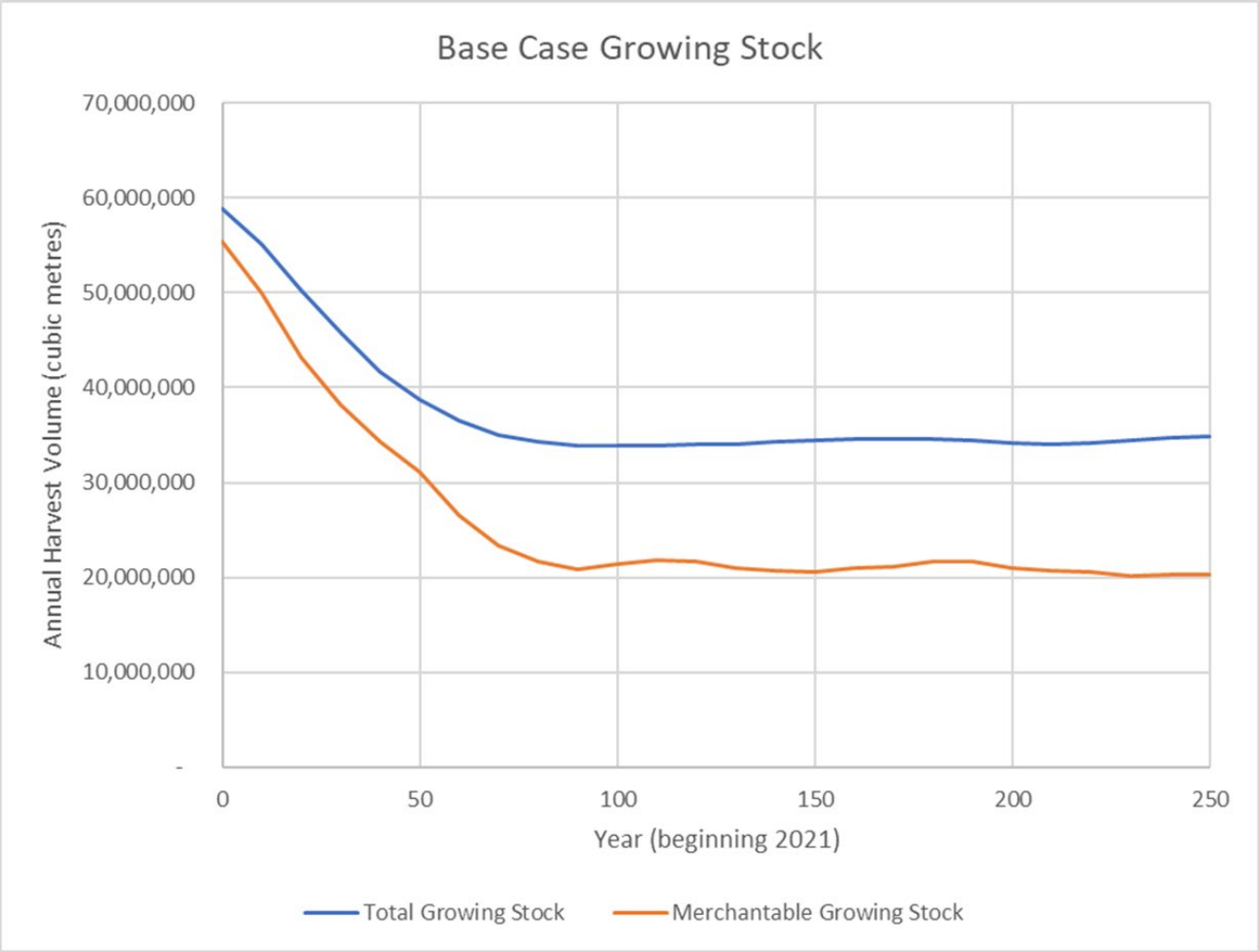


*Figure 16. Total and merchantable growing stock – Kispiox TSA, 2022.*

Figure 17 shows the mean volume and age of the stands harvested in the base case. The mean harvest age declines from a peak of about 270 years to about 100 years during the first 10 decades. However, the mean volume per hectare harvested remains at about 350 cubic metres per hectare throughout the projection horizon.

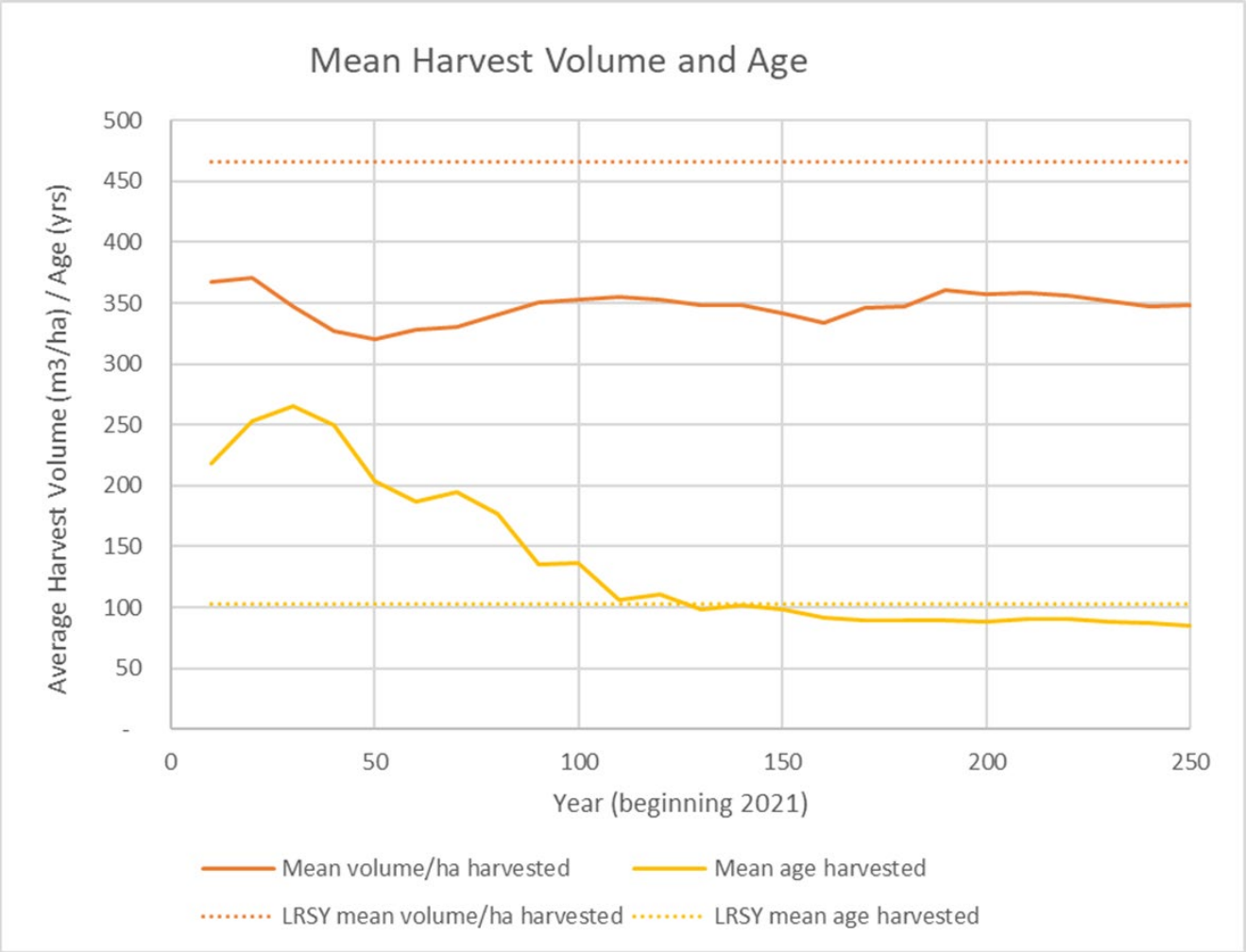


*Figure 17. Mean volume per hectare and age of harvested stands – Kispiox TSA, 2022.*

Figure 18 shows the mean annual area harvested for each decade in the base case. The mean area harvested fluctuates around 1900 hectares per year throughout the projection horizon. In the initial 10 years the mean area harvested is approximately 1700 hectares per year, this increases over the next 40 years to a maximum of approximately 2000 hectares per year in years 50 and 60 before declining. The period of increased harvest area corresponds with the decline in harvest volume per hectare over the same period shown in Figure 17. This results from the greater proportion of lower volume mature hemlock and balsam stands harvested between years 20 and 40 (averaging 77 percent), and the increasing proportion of lower volume naturally regenerated stands harvested between years 30 and 70 (averaging 22 percent).

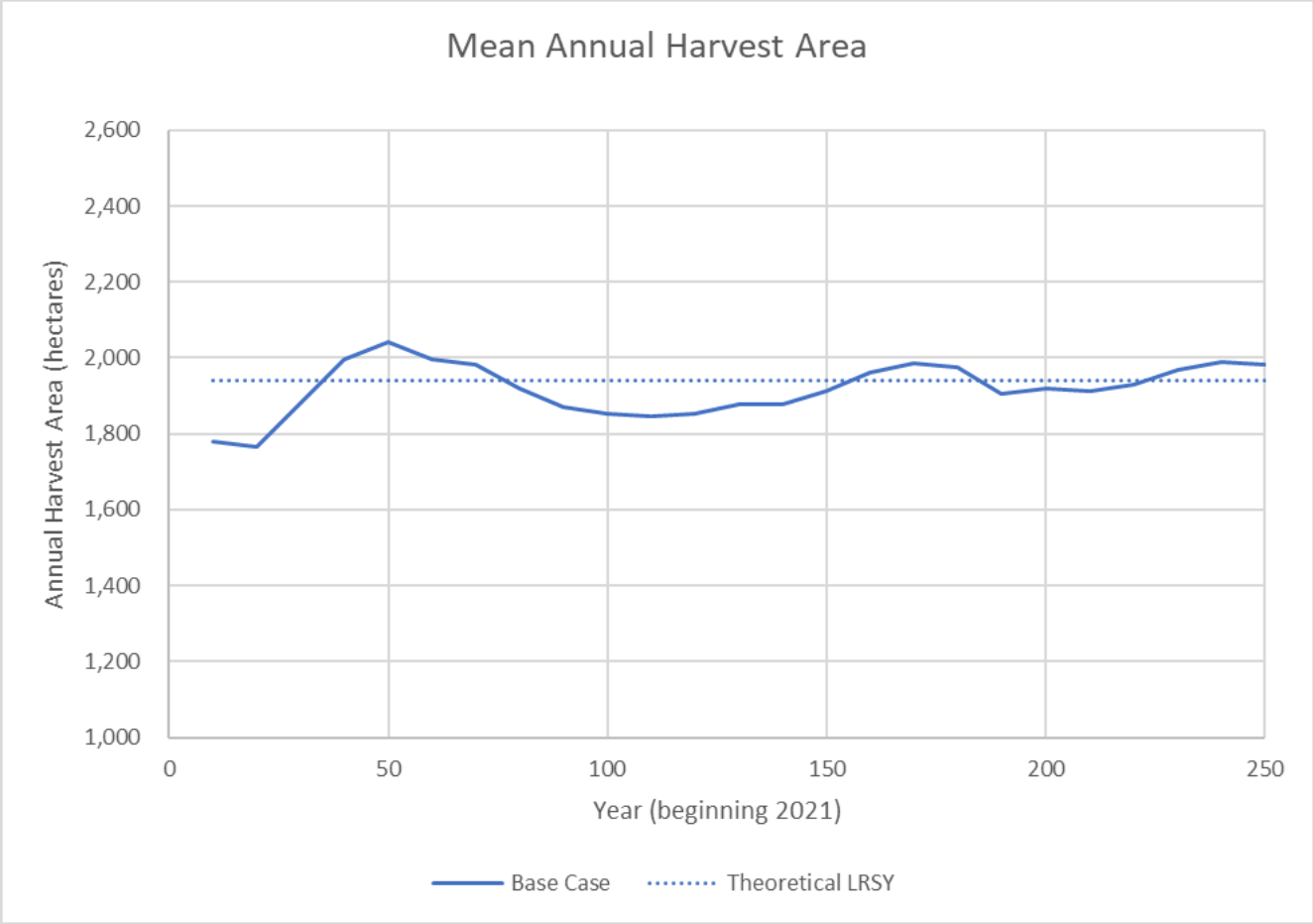


*Figure 18. Average area harvested – Kispiox TSA, 2022.*

Figure 19 shows the contribution of mature natural stands, naturally regenerated stands, and managed stands to the base case harvest projection.[2][3]

The contribution of mature natural stands to the harvest declines rapidly for the first 60 years and comprise only about 10 percent of the harvest by year 100. Managed stands are harvested throughout the base case projection period.

In the first 10 years of the projection a total of approximately 748 700 cubic metres is harvested from managed stands and over the first 40 years of the projections a total of approximately 1 324 000 cubic metres is harvested from managed stands. These are stands planted prior to 1987, classified as managed stands with natural regeneration. The contribution of managed stands to harvest increases rapidly after the first 40 years as planted stands reach minimum harvest criteria.

Yield curves for stands harvested and regenerated (planted or naturally regenerated) prior to 1987 were generated in TIPSY using natural regeneration stocking assumptions because stands regenerated prior to 1987 have limited planting records and were frequently regenerated without stocking standards. Although in future these stands will likely be regenerated with improved planting stock and standards, in the timber supply model these stands were assumed to represent future stands with natural regeneration, and the presence persists as seen in Figure 19.

[2] Stands regenerated prior to 1987 are characterized as "naturally regenerated" to reflect the spatial distribution pattern criteria applied in the Table Interpolated Stand Yield (TIPSY model). Many stands harvested prior to 1987 were regenerated by planting, however these stand pre-date the implementation of specific regimes for planting stock type, density, and species composition required under the *Forest Act* as of 1987.

[3] It is expected that generally, existing naturally regenerated stands will become planted managed stands after the next harvest. It is also expected that in the future, some portion of the timber harvesting land base will be naturally regenerated, to capture this expectation it was assumed that existing naturally regenerated stands will represent future naturally regenerated stands.

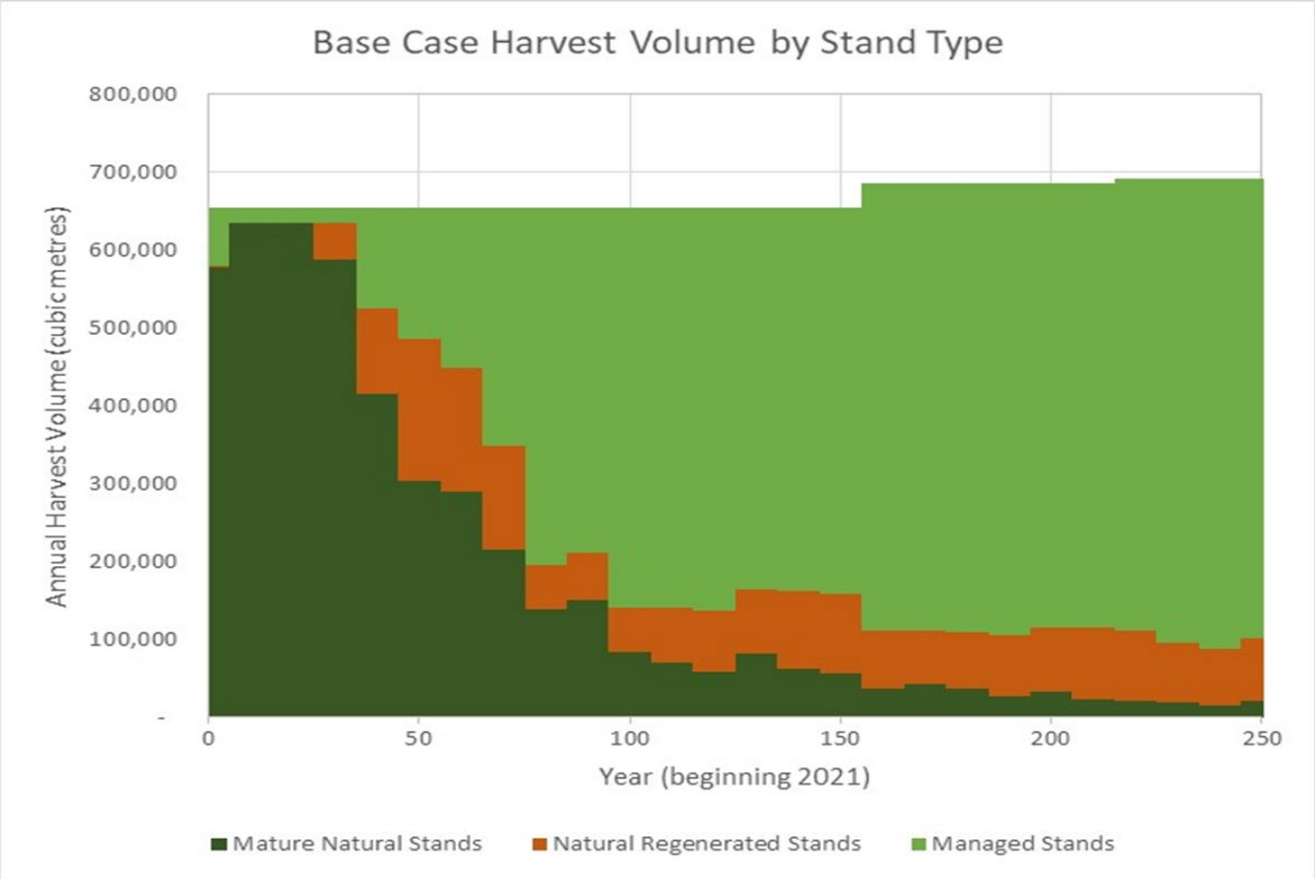


*Figure 19. Contribution of existing and managed stands to the base case harvest projection – Kispiox TSA, 2022.*

Figure 20 shows the species composition of the base case harvest projection. Hemlock, and balsam comprise approximately 65 percent of the harvest. Spruce, pine, cedar, and deciduous species comprise the remainder of the harvest.

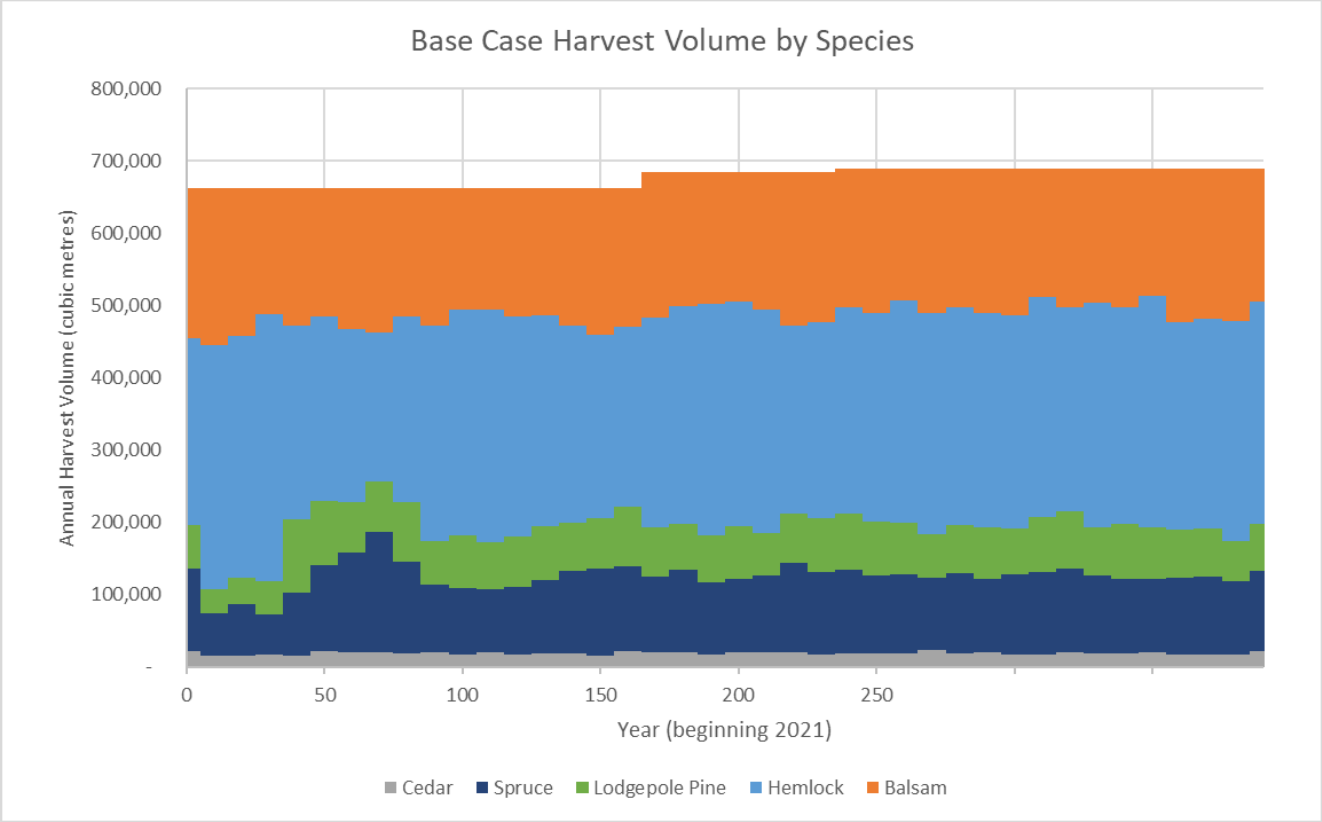


*Figure 20. Species composition of the base case harvest projection – Kispiox TSA, 2022.*

In the 2008 *Kispiox TSA Rationale for AAC Determination* the chief forester recommended monitoring the relative proportion of sawlog and non-sawlog harvest to advise future AAC determinations regarding the possible need for a wood quality partition. Harvest performance monitoring undertaken during the past decade has revealed minimal harvest of non-sawlog stand types.

Figure 21 shows the contribution of sawlog and non-sawlog stands to the base case harvest projection. The analysis assumes that marginal sawlog stands remain marginal after regeneration, and non-sawlog stands are converted to sawlog stands after regeneration. Figure 21 illustrates the reduced proportion of sawlog stands and increased reliance on non-sawlog stands to meet timber supply objectives in the near future. The volume of sawlog stands increased in the long term as converted stands contribute to timber supply.

It is noteworthy that the initial projected harvest of sawlogs stands of 358 600 cubic metres is similar to the actual average annual harvest level for the period of 2018 to 2022 of 394 100 cubic metres, suggesting that the sawlog classification is reasonable and that the timber supply model is capturing operational conditions influencing timber development.

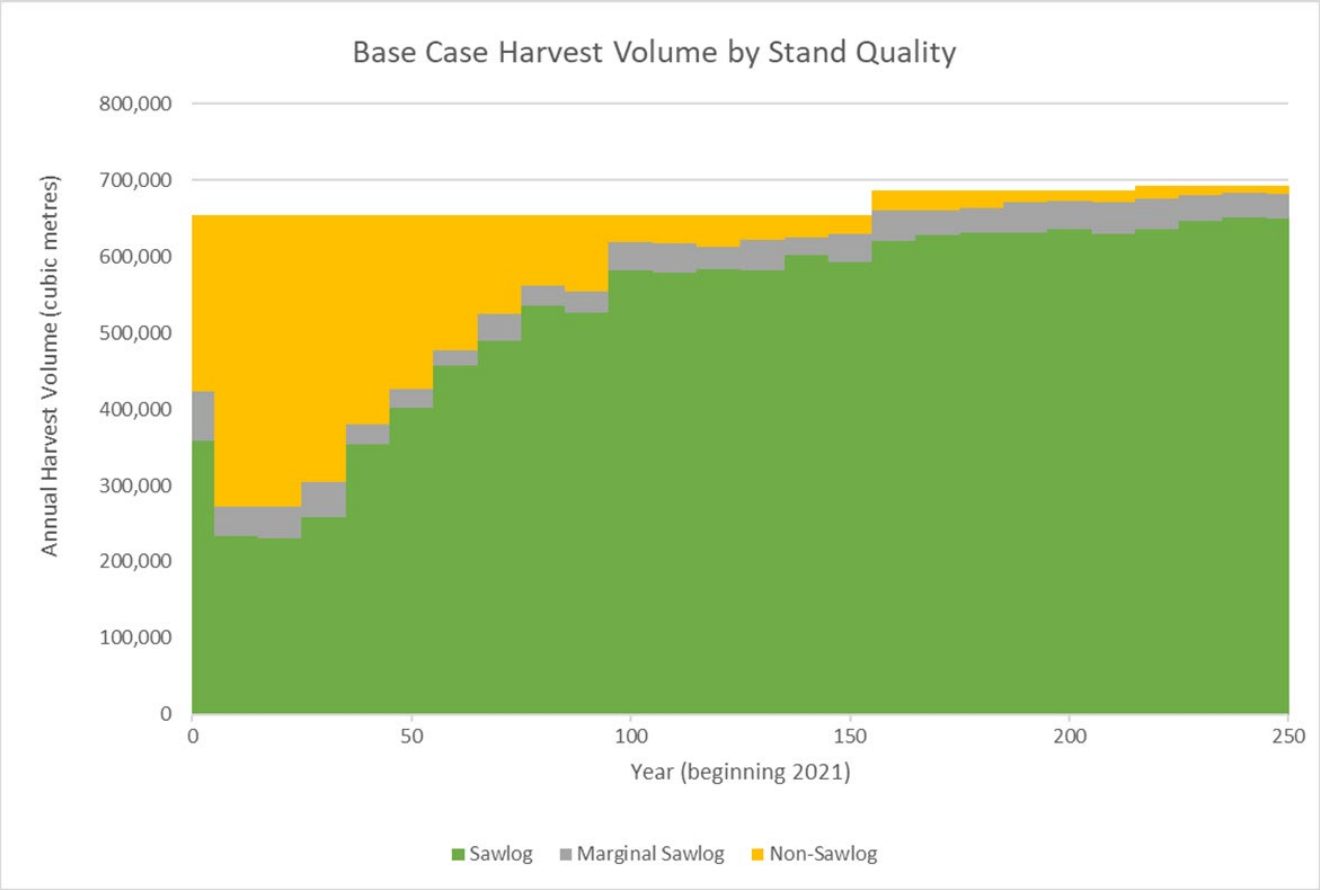


*Figure 21. Stand quality composition of the base case harvest projection – Kispiox TSA, 2022.*

### *Sensitivity analyses*

The base case uses a specific set of data and assumptions that are intended to reflect forest composition and growth, legally established land-use objectives, and current forest management practices. However, while the base case is designed to reflect current management in the Kispiox TSA, there is uncertainty about some data and management practices. Therefore, sensitivity analyses are used to examine the potential impacts of uncertainties about, or changes to, resource information and management practices. Key issues for the Kispiox TSA are discussed in the sensitivity analyses described below. Results for all sensitivity analyses conducted are summarized in Table 3. Some of the sensitivity analyses noted in Table 3 require additional discussion which is provided further in this section.

*Table 3. Summary of sensitivity analyses – Kispiox TSA*

| Key Issue | | Initial harvest ($m^3$/year) | Percent (%) change |
|---|---|---|---|
| **Base case** | | **654,200** | **N/A** |
| First Nations Strategic Plans | Investigate First Nations values represented in the Gitwangak LUP and Gitsegukla SRMP. | 654,200 | 0% |
| First Nations Cedar Sustainability | Exclude all cedar volume from timber supply. | 639,600 | -2.2% |
| First Nations Cedar Sustainability | Remove from the THLB areas identified in the 2021 Gitxsan Cedar Management Strategy. | 669,900 | +2.4% |
| First Nations WILP Boundaries | Apply 30 metre buffers to all WILP boundaries within the Kispiox TSA. | 647,391 | -1.0% |
| Natural Stand Yields +10% | Increase all VDYP yields by 10%. | 688,400 | 5.2% |
| Natural Stand Yields -10% | Decrease all VDYP yields by 10%. | 612,200 | -6.4% |
| Managed Stand Yields +10% | Increase TIPSY yields 10%. | 696,300 | 6.4% |
| Managed Stand Yields -10% | Decrease TIPSY yields 10%. | 615,200 | -6.0% |
| Remote Area | Include economically inoperable remote areas in the THLB. | 741,100 | 13.3% |
| Sawlog Sustainability | Model an even-flow model projection for sawlog quality stands | 661,100 | 1.1% |
| Minimum Harvestable Criteria Natural Stands +25% | Increase minimum harvestable volume in existing mature stands by 50 $m^3$/yr (25%) to 250 $m^3$/yr. | 611,300 | -6.6% |
| Minimum Harvestable Criteria Natural Stands -25% | Decrease minimum harvestable volume in existing mature stands by 50 $m^3$/yr (25%) to 150 $m^3$/yr. | 668,900 | 2.2% |
| Minimum Harvestable Criteria Managed Stands 100% CMAI | Increase minimum harvestable criteria in managed stands to 100% of culmination of mean annual increment. | 579,100 | -11.5% |
| Minimum Harvestable Criteria Managed Stands 90% CMAI | Decrease minimum harvestable criteria in managed stands to 90% of culmination of mean annual increment. | 658,200 | 0.6% |
| Forest Health – Tomentosus 1 | Apply a 30% reduction to spruce component of all existing-managed and future-managed stands throughout ICH biogeoclimatic zone | 638,672 | -2.4% |
| Forest Health – Tomentosus 2 | Apply a 30% reduction to the spruce component of all existing managed stands throughout the Kispiox TSA. | 654,300 | 0.0% |
| Forest Health – Tomentosus 3 | Apply no reduction to spruce component of managed stands. | 661,100 | 1.1% |
| Forest Health – | Apply a 30% reduction to balsam leading stands older than 250 years of age and within the ESSF. | 634,800 | -3.0% |
| Wildlife Habitat - Northern Goshawk | Apply a no-harvest constraint to known and potential northern goshawk nest site buffers and a minimum 60% mature + old seral retention requirement to known and potential foraging territories. | 623,000 | -4.8% |

| Key Issue | | Initial harvest ($m^3$/year) | Percent (%) change |
|---|---|---|---|
| Cumulative Effects 1- Grizzly Bear | Limit road density in Grizzly Assessment Watersheds | 564,500 | -13.7% |
| Cumulative Effects 1 – Grizzly Bear | Apply seral retention where at least 30% of stands in high quality grizzly habitat landscape units are mid-seral or older condition | 560,500 | -14.3% |
| Cumulative Effects 2 - Xadaa Moose Winter Habitat Tier 1 | Remove Core Winter Habitat from THLB | 629,900 | -3.7% |
| Cumulative Effects 2 - Xadaa Moose Winter Habitat Tier 2 | Remove Core Winter Habitat from THLB, additional retention to the moose stream, river and wetland buffers | 627,000 | -4.2% |
| Cumulative Effects 2 - Xadaa Moose Winter Habitat Tier 3 | Remove Core Winter Habitat from THLB, additional retention to the moose stream, river and wetland buffers, apply yields with lower stocking targets. | 560,453 | -14.3% |
| Natural Disturbance | Do not model natural disturbance regimes applied in the base case. | 860,300 | 31.5% |
| Sensitive Watersheds | Replace the IWAP hydrologic recovery curve used in the base case with the Rain-on-Snow hydrologic recovery curve | 654,300 | 0.0% |
| Old Growth Protection | Remove all areas identified by the Technical Advisory Panel (TAP) Priority Deferral Areas | 609,300 | -6.9% |
| Road Development Restrictions | Limit road construction to maximum of 25% above weighted average road development costs | 583,700 | -10.8% |

**First Nations Strategic Plans**

The base case analysis included the 2016 legalized Cranberry SRMP which captures many of the objectives, measures/indicators, and targets of the *Gitanyow Lax'yip Land Use Plan*.

Within the Kispiox TSA there are First Nations strategic plans that have not been legalized, although the Province does accept that they are reasonably representative of the resource management interests of the community. The Gitsegukla Landscape Unit Plan, although not legal, was used by the Province to develop a draft Sustainable Resource Management Plan (SRMP).

The Gitwangak Land Use Plan is another First Nation's strategic plan that has not been legalized but has been incorporated into the Forest Stewardship Plans of three Kispiox-based licensees (Gitxsan Forest Licence Inc., Kispiox River Timber Ltd., and Northwest BC Timber Resources Ltd.). Elements of the Gitwangak Land Use Plan that were incorporated into the base case analysis include:

- Remove THLB within Ecosystem Networks overlapping the operating areas of the Kispiox-based Licensees;
- Apply forest cover constraints to the Ecosystem Network Buffers overlapping the operating areas of the Kispiox-based Licensees.

Specifically, a sensitivity analysis was completed that incorporates the objectives, measures/indicators, and targets of the Cranberry SRMP applied across entire Kispiox TSA. This includes:

- Remove THLB from Core Ecosystems identified in the West Babine SRMP;
- Remove Ecosystem Network identified in the Gitsegukla Landscape Unit Plan;
- Remove areas classified as wildlife patches in the Gitsegukla operability layer or the Gitwangak operability layer.

#### Cedar Sustainability

The Provincial Timber Management Goals, Objectives & Targets reports provide a current "state of affairs" for the timber management targets of each TSA. The management unit targets report for the Kispiox TSA indicates that, for the period of 2018 to 2022, cedar contributed approximately nine percent of annual harvest, that represents an annual cedar harvest of approximately 35 000 cubic metres.

In the base case, stands identified as Gitanyow Cedar Stand Reserves (cedar reserves), approximately 697 hectares, remained within the THLB. These stands were subject to a forest cover disturbance limit of no more than 15 percent of the cedar reserves allowed to be less than 40 years of age at any time.

Figure 22 shows the projected volume of cedar harvested in the base case. This projection includes the volume from stands identified in the Gitanyow Cedar Stand Reserves. The analysis indicates that the Kispiox TSA can sustain an annual harvest of cedar of approximately 15 000 cubic metres based on current management assumptions.

A sensitivity was completed that excluded from the THLB stands that were identified in the 2021 Gitxsan Cedar Management Strategy. Excluding these areas from the THLB increased timber supply by 2.4 percent, this is an unusual result and is due two confounding factors. First, deferring cedar stands caused a rescheduling of harvest units with higher productivity and increasing merchantable growing stock at an important point in the timber supply projection. The second related factor is that rescheduled harvest units located in management units with restrictive visual quality objectives achieve green-up requirements sooner.

Two additional sensitivity analyses related to cedar were completed. One analysis excluded all cedar volume from the timber supply projections. Excluding cedar volume reduced timber supply by 2.2 percent relative to the base case, resulting in an annual harvest level of approximately 639 600 cubic metres.

The second sensitivity analysis excluded cedar volume from the timber supply projections for stands greater than 249 years of age. This resulted in a 0.4 percent reduction in timber supply relative to the base case, and an annual harvest level of 657 200 cubic metres.

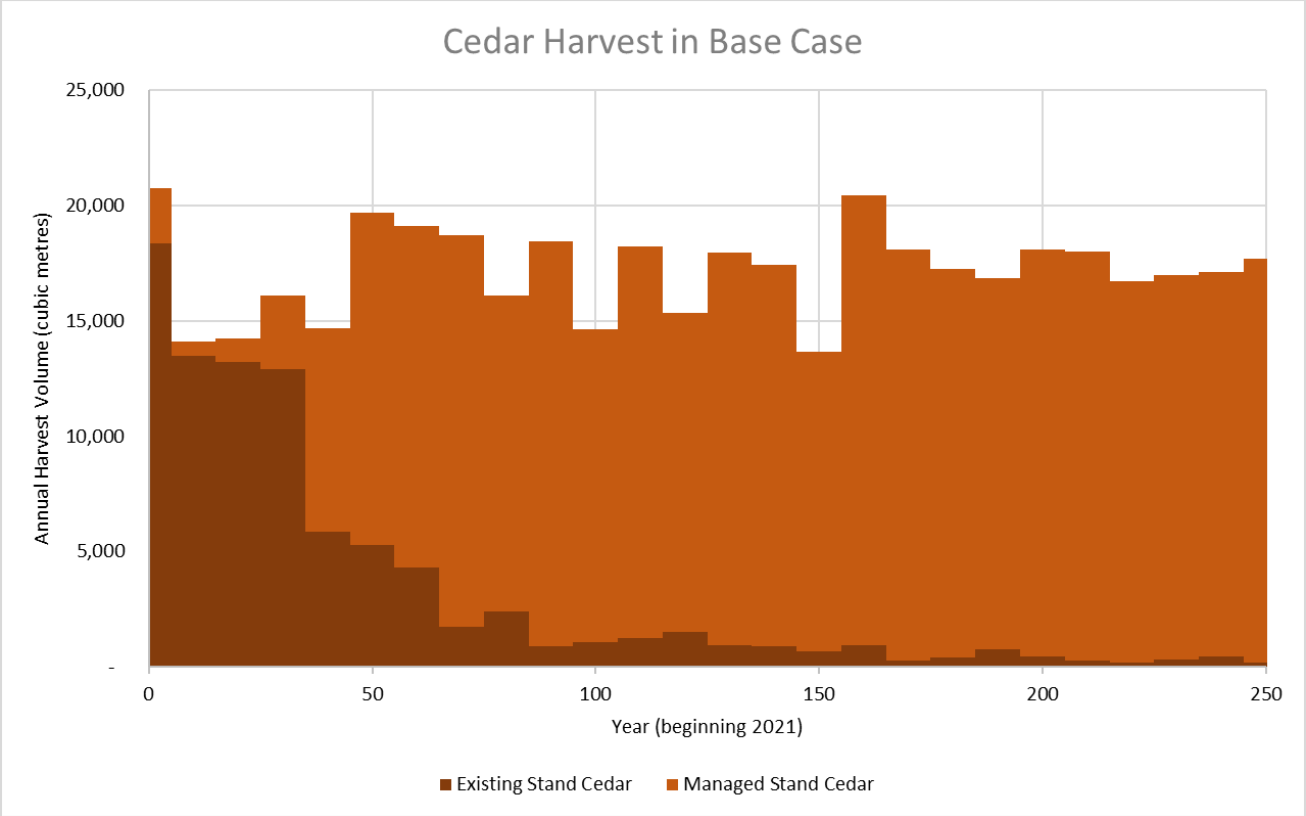


*Figure 22. Cedar harvest in the base case – Kispiox TSA, 2022.*

### Sawlog sustainability

The base case timber supply projection reports the contributions of sawlog, marginal sawlog and non-sawlog quality stands but did not model priorities related to stand quality type. Figure 23 presents an alternative projection where harvest priorities attempt to maintain steady proportions of each stand quality type.

Once harvested, non-sawlog stands are converted to sawlog stands, while marginal sawlog stands remain marginal, this is based on the rationale that some portion of stands remain marginal in the future.

Deriving steady proportions by stand quality type is dynamic because of the conversion from non-sawlog to sawlog. The modelling objective in balancing the stand quality type was to convert stands from non-sawlog as soon as possible at a steady rate. Under this scenario the combined short-term sawlog and marginal sawlog annual harvest volume is 333 800 cubic metres, this is 50.5 percent of the total short-term timber supply.

The sensitivity analysis illustrates that moderating the development of sawlog stands in the short-term improves sustainability of this stand type in the mid-term and hastens the transition to a harvest profile with higher proportions of sawlog.

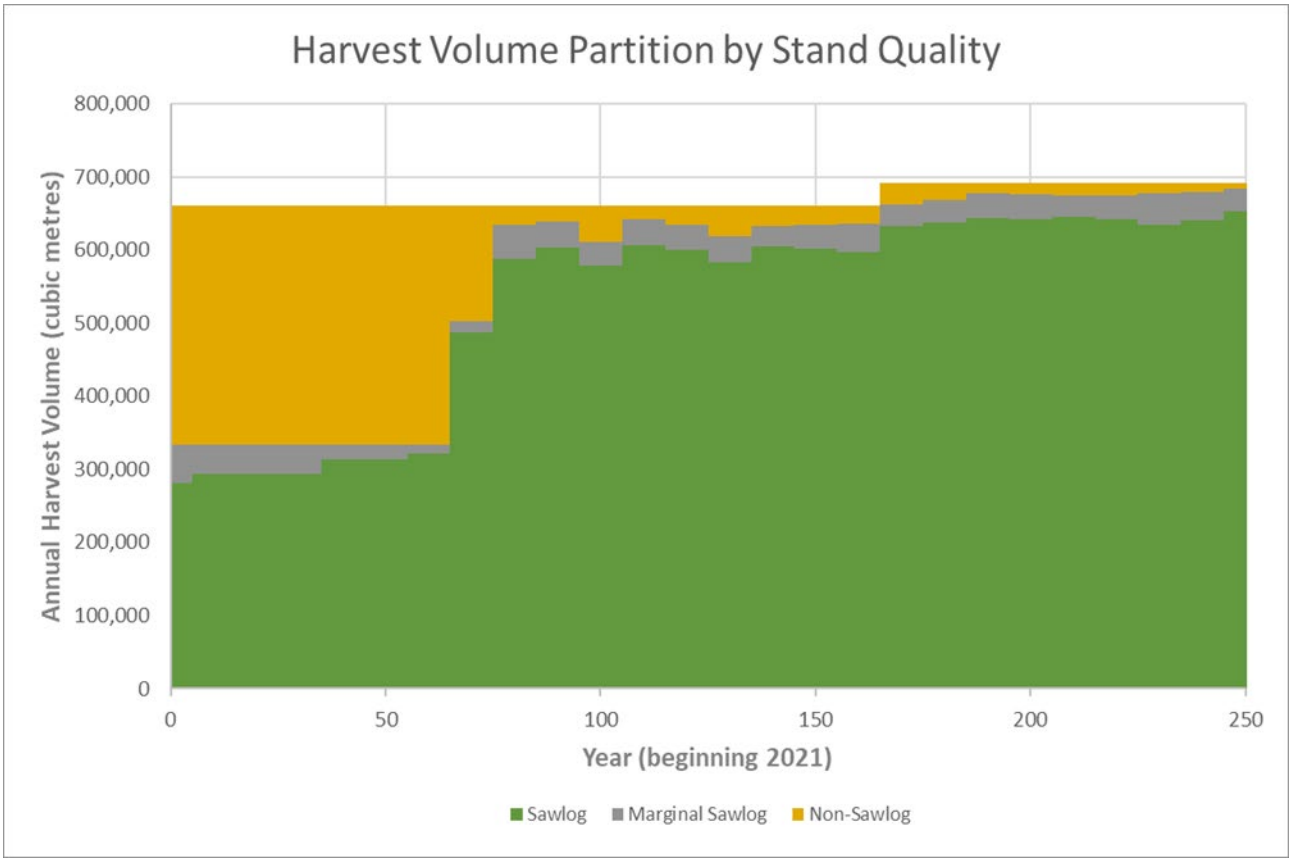


*Figure 23. Harvest forecast where harvest priorities attempt to maintain steady proportions of each stand quality type – Kispiox TSA, 2022.*

### Inclusion of remote areas

In the previous analysis, remote areas (see Figure 12) were included in the THLB but the AAC was partitioned to set a sustainable harvest level from the more accessible areas. Since 2008, no harvesting occurred in these remote areas, so they were excluded from the THLB in this analysis.

A sensitivity analysis was conducted to show the possible contribution of remote areas if they were economical to harvest and were included in the THLB. The areas classified as remote cover 479 312 hectares. The THLB portion of the remote areas is approximately 37 700 hectares or 14 percent of the current THLB of the TSA.

If remote areas were included in the THLB the initial harvest level could be increased from 654 200 cubic metres per year to 741 100 cubic metres per year (13.3 percent). This increase continues throughout the harvest projection.

### Minimum harvestable criteria

Timber supply is influenced by minimum harvestable criteria. In the base case minimum harvestable criteria was defined by a minimum harvest volume for natural stands, whereas the minimum harvest criteria for managed stands was set by its proximity to culmination age. In natural stands the minimum harvest criteria was set to the age at which a stand achieved a minimum volume of 200 cubic metres per hectare. For managed stands the minimum harvest criteria was set to the age at which the stand reaches 95 percent of culmination.

Sensitivity analysis investigated the assumptions around minimum harvestable volume thresholds in natural stands by increasing and decreasing the volume criteria by 50 cubic metres per hectare, that is by setting minimum harvestable volume thresholds of 250 cubic metres per hectare and 150 cubic metres per hectare, respectively.

The sensitivity analysis around minimum harvestable criteria in mature stands indicates that short-term timber supply is sensitive to increases in the minimum harvestable volume. A 50 cubic metre per hectare increase in minimum harvestable volume results in a 6.6 percent decrease in short-term timber supply.

Sensitivity analysis investigated the assumptions around minimum harvestable volume thresholds in managed stands by increasing and decreasing the proximity to culmination by five percent, that is by setting minimum harvestable age to culmination age and the age at which 90 percent of culmination is achieved, respectively.

The sensitivity analysis around minimum harvest criteria in managed stands demonstrates that short-term timber supply is sensitive to increases in the minimum harvestable age of managed stands. An increase in minimum harvestable age from the age at which 95 percent of culmination is achieved to the age at 100 percent of culmination results in a 11.5 percent decrease in short-term timber supply.

#### Forest health and climate change

In the base case, no adjustments were made to account for potential losses due to Western Balsam Bark Beetle (IBB), although assumptions around the delays in stand development due to IBB infestation were modelled. A sensitivity analysis explored the potential impact of IBB in balsam stands by reducing total stand volume by 30 percent for all balsam-leading stands older than 250 years located within the ESSF biogeoclimatic zone. This resulted in a three percent reduction of timber supply.

One of the ways of exploring uncertainty in the harvest projection associated with climate change is through a risk 'tranche' approach. A tranche sensitivity is a method of structured analysis based on risk tranches in which risk is modelled as an increasing function over time from the most optimistic assumptions to the more pessimistic assumptions. In the Kispiox TSA, risk within the base case was associated with changing prevalence of IBB associated with a warming climate. Changes due to climate were modelled as dynamic frequencies in IBB disturbance. Dynamic changes in IBB outbreaks were modelled by projecting the timber supply for five different risk classes (Table 4) based on the following criteria:

- amount of harvest in subalpine fir-leading (greater than or equal to 50 percent) stands; and,
- frequency (return period) of reoccurring IBB outbreaks in subalpine fir-leading stands.

*Table 4. Climate change sensitivity analysis risk 'tranche' classes for the Kispiox TSA*

| Risk class | Subalpine fir-leading harvest | IBB Outbreak frequency rotation (years) |
|---|---|---|
| Class 1 (Low Risk) | No | 100 |
| Class 2 | Yes | 100 |
| Class 3 | Yes | 215 |
| Class 4 | Yes | 400 |
| Class 5 (High Risk) | Yes | No Outbreaks |

The lowest risk (least optimistic) class assumes no harvest in subalpine fir-leading stands and a relatively short IBB outbreak rotation (high outbreak frequency). Since there was no harvesting in the subalpine fir-leading stands, the effect of the IBB outbreaks on timber supply would only be noticeable if the disturbed stands prevented the achievement of forest cover objectives. The highest risk (most optimistic) class assumes there will be no outbreaks of IBB and that all merchantable stands of subalpine fir-leading within the THLB will contribute to timber supply.

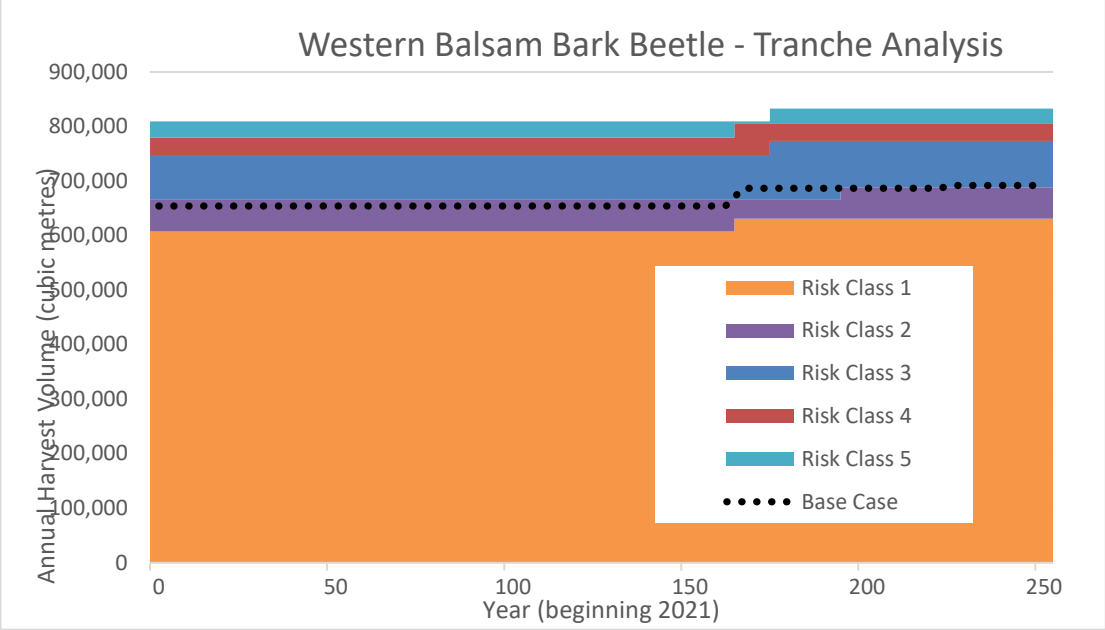


*Figure 24. Climate change sensitivity analysis risk 'tranche' analysis results for the Kispiox TSA.*

*Risk Class 1 - no harvest of subalpine fir-leading stands, IBB with a 100-year rotation;*
*Risk Class 2 - includes timber supply from subalpine fir-leading stands;*
*Risk Class 3 - reduced IBB disturbance to a 215-year rotation;*
*Risk Class 4 - reduced IBB disturbance to a 400-year rotation;*
*Risk Class 5 - no IBB disturbance.*

The results shown in Figure 24 indicate:

1. Risk Class 1 (Low Risk) – the base case timber supply does not heavily depend on the contribution of subalpine fir-leading stands since the Risk Class 1 tranche is able to achieve 93 percent of the base case harvest level with these stands excluded);
2. Risk Class 2 – risk class 2 demonstrated that modelling IBB explicitly and with an outbreak frequency that was nearly double the current rate (derived from the IBB NRL reported in the *Data Package*) resulted in a harvest flow similar to the base case (two percent higher) which indicates that the base case harvest level is relatively robust to potential increases in IBB outbreak disturbance;
3. Risk Class 3 – risk class 3 utilized the current rate of IBB frequency. The results indicated if conditions were to remain the same, a significant increase in timber supply is possible and,
4. Risk Classes 4 and 5 (High Risk) – the two highest risk classes represent the most optimistic assumptions regarding the IBB outbreak frequency, with Class 5 making the extreme assumption that IBB outbreaks will cease to occur. The marginal increase in timber supply is relatively small, given the level of uncertainty associated with these classes.

Results of the tranche sensitivity indicate that when there is a higher frequency (shorter return period) of IBB as in Risk Class 1, there is a low risk that the base case harvest projection will not be being realized. In the figure above, the base case projection line lies just above Risk Class 2 indicating that even with an increase in IBB due to climate change, there is sufficient growing stock to maintain the timber supply in the short- to mid-term.

## Regional economy and socio-economic analysis

The implication of changes in the timber supply for local communities is an important consideration in the timber supply review. It is recognized that the forestry sector plays a significant role in local economies and employment and supports additional employment through businesses purchasing goods and services (indirect impact) and through employees spending their income on local goods and services (induced impact).

The chief forester will consider the results of this analysis in the AAC determination. It should be noted that it is not appropriate for the chief forester to speculate on business decisions of the forest industry. The utilization of the AAC, including employment levels and types of forestry products, depends on business and operational plans.

As part of the Kispiox TSR the Ministry of Forests Economics and Trade Branch completed a socio-economic analysis (SEA), portions of that analysis are presented below, the full report is available upon request. The SEA evaluated three AAC scenarios: a base case AAC, maintain the current AAC, and include the remote areas AAC. These scenarios project a maximum sustainable harvest over long periods of time, but the socio-economic impacts calculated utilize the projected volume at year 10, which are assumed to also reflect near-term (immediate) impacts.

The estimated economic impacts of these three scenarios are presented in Table 5 and Table 6. Table 5 includes direct impacts from the Forest Sector industries themselves, while Table 6 adds the indirect impacts of the industries supplying the Forest Sector.

The impacts presented for each scenario represent the upper bound of impacts, a maximum potential, since calculations assume 100 percent of scenario volume is harvested. Additionally, these impacts are not limited to the management unit under review and instead may be occurring anywhere in the province. For example, logs from the Kispiox TSA may be used by West Fraser's Smithers mill in the Bulkley TSA, or lumber produced in the Kispiox TSA may be remanufactured in Vancouver.

While the impacts typically represent an upper bound, effort is made to assess whether these impacts will be realized, or if some lower level is likely. Given that recent average annual harvest performance has been 394 100 cubic metres, and that all three AAC scenarios are above demonstrated harvest performance, for this reason it is possible that the new AAC may not alter socio-economic conditions within the TSA. The estimated economic impacts associated with the 394 100 cubic metres are also displayed in Table 5 and Table 6 to provide context for alternative scenarios.

The estimates of Table 5 and Table 6 rely on input-output model results provided by Statistics Canada, which the Ministry of Forests, in partnership with the Council of Forest Industries (COFI), further modifies. More information can be found on the Ministry's website. Note that while the economic impacts presented here rely on information provided by Statistics Canada, Statistics Canada is not associated with the economic impacts generated using that information.

*Table 5. Direct impacts from TSA AAC scenarios and actual harvest*

| Dollar values in millions | Indicator | Base case - year 10 | Maintain current AAC - year 10 | Include remote areas – year 10 | Current AAC | Impacts from average annual harvest - 2018-2022 |
|---|---|---|---|---|---|---|
| *Harvest Related* | Harvest Volume | 654,200 | 910,000 | 741,100 | 1,087,000 | 394,100 |
| | Gov. Stumpage Revenue[4] | $11 | $15 | $13 | $18 | $7 |
| *Forestry and Logging Impacts*[5] | Output (Gross Sales) | $46 | $64 | $52 | $76 | $28 |
| | GDP | $21 | $29 | $23 | $34 | $12 |
| | Additional Provincial Revenue[4] | $2 | $2 | $2 | $3 | $1 |
| | Employment | 127 | 176 | 143 | 210 | 76 |
| *Manufacturing Impacts* | Output (Gross Sales) | $111 | $155 | $126 | $185 | $67 |
| | GDP | $32 | $45 | $36 | $53 | $19 |
| | Additional Provincial Revenue[4] | $3 | $4 | $3 | $5 | $2 |
| | Employment | 207 | 288 | 235 | 344 | 125 |
| *Total Impact* | Output (Gross Sales) | $157 | $218 | $178 | $261 | $95 |
| | GDP | $53 | $73 | $60 | $88 | $32 |
| | Total Provincial Revenue | $16 | $22 | $18 | $26 | $9 |
| | Employment | 334 | 464 | 378 | 554 | 201 |

[4] Based on five-year average from 2018-2022. Additional Gov. Revenue covers sales taxes, commodity taxes, plus corporate and individual income tax.
[5] Includes support activities for forestry and logging.

*Table 6. Direct plus indirect impacts from TSA AAC scenarios and actual harvest*

| Dollar values in millions | Indicator | Base case – year 10 | Alternative – year 10 | Sensitivity - remote areas – Year 10 | Current AAC | Impacts from average annual harvest – 2018-2022 |
|---|---|---|---|---|---|---|
| *Harvest Related* | Harvest Volume | 654,200 | 910,000 | 741,100 | 1,087,000 | 394,100 |
| | Gov. Stumpage Revenue[6] | $11 | $15 | $13 | $18 | $7 |
| *Forestry and Logging Impacts*[7] | Output (Gross Sales) | $61 | $84 | $69 | $101 | $37 |
| | GDP | $28 | $39 | $31 | $46 | $17 |
| | Additional Provincial Revenue[6] | $2 | $3 | $3 | $4 | $2 |
| | Employment | 194 | 269 | 219 | 322 | 117 |
| *Manufacturing Impacts* | Output (Gross Sales) | $138 | $192 | $157 | $230 | $83 |
| | GDP | $47 | $65 | $53 | $77 | $28 |
| | Additional Provincial Revenue[6] | $4 | $6 | $5 | $7 | $3 |
| | Employment | 337 | 468 | 381 | 559 | 203 |
| *Total Impact* | Output (Gross Sales) | $199 | $277 | $225 | $330 | $120 |
| | GDP | $74 | $103 | $84 | $124 | $45 |
| | Total Provincial Revenue | $18 | $25 | $20 | $30 | $11 |
| | Employment | 530 | 737 | 601 | 881 | 319 |

## Summary

Effective March 31, 2009, (after the amalgamation of the Cranberry TSA) the AAC for the Kispiox TSA was set at 1 087 000 cubic metres. Of this total, 177 000 cubic metres was expected to be harvested from geographically remote areas of the TSA. The average annual harvest for the period 2012 to 2021 was 304 877 cubic metres. It is now more than 10 years since the last AAC was determined for the Kispiox TSA, therefore the chief forester has decided that it is time to review the timber supply and determine a new AAC for the TSA.

The base case harvest projection indicates that an initial harvest level of 654 200 cubic metres per year can be maintained for 160 years before increasing to the long-term harvest level of 686 600 cubic metres per year. Two alternative harvest flows were also completed. The first alternative (Alternative 1) maintained the current AAC, adjusted for the exclusion of areas classified as remote, as long as possible. The current adjusted AAC of 910 000 can be maintained for 10 years before incremental reductions draw down timber supply to a stable long-term harvest level. The second alternative (Alternative 2) maintained an annual harvest level of

[6] Based on five-year average from 2018-2022. Additional Gov. Revenue covers sales taxes, commodity taxes, plus corporate and individual income tax.
[7] Includes support activities for forestry and logging.

800 000 cubic metres, approximately 11 percent below the current adjusted AAC, for 20 years before incremental reductions draw down timber supply to a stable long-term harvest level similar to Alternative 1.

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*. This includes information obtained through collaborating and engaging with First Nations. An AAC is neither the result of a calculation nor limited to the results of timber supply analysis; therefore, the new AAC may not be the same as any of the initial harvest levels depicted in any of the scenarios included in this document.

## Next steps

Comments on the *Discussion Paper* are requested by April 13, 2024 which provides for a review period of 60 days.

During the review period, ministry staff will be actively engaging with First Nations, licensees, stakeholder groups, and the public.

After the review period ends, the chief forester will then conduct a determination meeting where consideration will be given to not only information provided through the *Data Package* and *Timber Supply Analysis* but also information, objectives, and uncertainties that were unavailable or could not be quantified. This includes all of the input from the public review and First Nations consultation.

In the months following the determination meeting, the chief forester will announce the new AAC in a rationale document. The chief forester's *Rationale Statement* provides a description of the new AAC, explains how the factors required under Section 8 of the *Forest Act* and, where appropriate, the input received from the public and First Nations were considered, and identifies where new information is required.

Following the chief forester's AAC decision, the Minister of Forests apportions the volume to licence types based on a disposition plan prepared by the regional executive director.

## Your input is needed

Public input is a vital part of establishing the allowable annual cut. Feedback is welcomed on any aspect of this *Discussion Paper*, the *Data Package* or any other issue related to the timber supply review and the allowable annual cut determination for the Kispiox TSA.

Ministry staff would be pleased to answer questions to help you prepare your response. Please send your comments to the Stewardship Officer at the address below.

Your comments will be accepted until April 13, 2024.

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 or questions, contact:

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Skeena Stikine Natural Resource District
Ministry of Forests
BAG 6000, Smithers, BC V0J 2N0
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For information on the Timber Supply Review visit the Timber Supply Review & Allowable Annual Cut web site at https://www2.gov.bc.ca/gov/content/industry/forestry/managing-our-forest-resources/timber-supply-review-and-allowable-annual-cut

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

## Appendix 1: Updated Data Package for Kispiox TSA

The *Updated Data Package* for the Kispiox TSA can be found at https://www2.gov.bc.ca/gov/content/industry/forestry/managing-our-forest-resources/timber-supply-review-and-allowable-annual-cut/allowable-annual-cut-timber-supply-areas/kispiox-tsa