



# **Arrow Timber Supply Area Timber Supply Analysis Discussion Paper**

**September 2016**

**Forest Analysis and Inventory Branch  
Ministry of Forests, Lands and  
Natural Resource Operations**

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Ministry of  
Forests, Lands and  
Natural Resource Operations

Cover photograph of Slocan Lake  
Courtesy of Julie Castonguay

## Introduction

The British Columbia Ministry of Forests, Lands and Natural Resource Operations (FLNRO) regularly reviews the timber supply<sup>a</sup> for all timber supply areas<sup>b</sup> (TSA) and tree farm licences<sup>c</sup> (TFL) in the province. This review, the fourth for the Arrow TSA, 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. Based on this review the chief forester will determine a new allowable annual cut<sup>d</sup> (AAC) for the Arrow TSA.

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

The objectives of the timber supply review are to:

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

This discussion paper provides a summary of the results of the timber supply analysis for the timber supply review of the Arrow TSA. Details about the data and assumptions used in the analysis were provided in a data package (April 2016). Updates to the information used and technical details regarding the analysis are available on request from the FLNRO Forest Analysis and Inventory Branch. The timber supply analysis should be viewed as a “work in progress”. Prior to the chief forester’s AAC determination for the TSA, further analysis may need to be completed and existing analysis reassessed as a result of input received on this discussion paper.

Timber supply reviews undertaken in support of AAC determinations are based on the current resource management objectives established by government in legislation and by legal orders. For the purposes of the Arrow TSA timber supply review, forest management objectives are provided by the *Forest and Range Practices Act* (FRPA), the Kootenay Boundary Higher Level Plan Order (KBHLPO), and subsequent order variances for specific objectives. The information compiled to support this timber supply review can be made available to support land-use planning as required. However, land-use planning and land-use decisions are outside the scope of the chief forester’s AAC determination. In the event that resource management objectives and practices change, these changes can be reflected in future timber supply reviews.

Public comments are encouraged and will be accepted until the end of the 60-day review period, on November 21, 2016.

**<sup>a</sup>Timber supply**

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

**<sup>b</sup>Timber supply areas (TSAs)**

*Timber supply areas are integrated resource management units established in accordance with Section 7 of the Forest Act.*

**<sup>c</sup>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.*

**<sup>d</sup>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.*

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## Timber supply review in the Arrow TSA

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The AAC for Arrow TSA effective July 1, 2005 was 550 000 cubic metres. On December 11, 2011, the AAC was automatically reduced to 513 700 cubic metres under the AAC Administration Regulation to account for a new Community Forest Agreement (CFA).

In April 2016, 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 being released in order to provide an overview of the timber supply review and to highlight the key findings of the timber supply analysis for the Arrow 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, the public, licensees and First Nations. Following this review, the chief forester's determination will be outlined in a rationale statement that will be publicly available.

The actual AAC that is determined by the chief forester during this timber supply review may differ from the harvest projections, 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, the Minister of Forests, Lands and Natural Resource Operations 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.

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## Description of the Arrow TSA

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The Arrow Timber Supply Area is situated in south-eastern British Columbia in the Kootenay Boundary Natural Resource Region. It is part of the Selkirk Natural Resource District and is administered from the FLNRO district office in Nelson.

The Arrow TSA (Figure 1) is one of seven TSAs lying within the Kootenay Boundary Natural Resource Region. Two TFLs and several parks lie within the outer perimeter of the TSA. The total area of the Arrow TSA including TFLs is approximately 1 286 000 hectares. The core area of the TSA excludes TFLs and is 816 115 hectares in size.

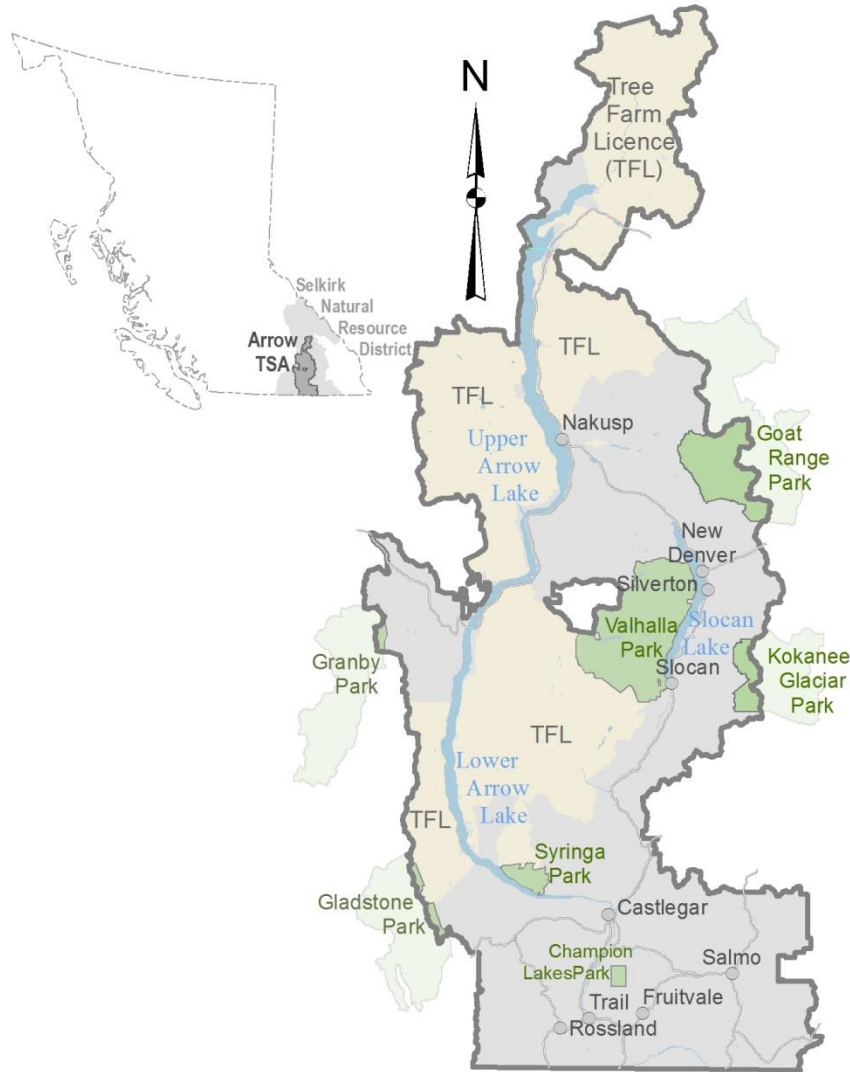


Figure 1. Map of the Arrow TSA.

**Environmental values**

Forests in the Arrow TSA are among the most productive and diverse in the interior of the province. Predominant tree species at lower elevations are Douglas-fir, lodgepole pine, western larch, western hemlock and western redcedar, and at higher elevations they are subalpine fir and Engelmann spruce. White pine, ponderosa pine, grand fir, aspen, black cottonwood and paper birch are also common in the TSA.

The Arrow TSA supports a diversity of fish and wildlife species. For example, nearly all the ungulate species present in BC, including bighorn sheep, white-tailed and mule deer, moose, mountain goats, elk and caribou are found in the TSA.

Protection and management of environmental values are addressed under provincial and federal legislation. FRPA is the primary provincial legislation regulating forestry practices. Under FRPA, the Forest Planning and Practices Regulation identifies objectives set by government for environmental values including fish, wildlife, biodiversity, soils and water that are to be addressed within forest stewardship plans. Orders may be established under the Government Actions Regulation (GAR) or the Land Use Objectives Regulation for specific land uses such as ungulate winter ranges, wildlife habitat areas, critical habitat for fish, and old growth management areas (OGMA). Approximately 41 percent of the Crown forest management land base<sup>c</sup> (CFMLB) of the Arrow TSA is provincially designated for the protection of its natural environment.

## Natural resources

Numerous natural resources occur within the Arrow TSA. These include timber, fish and wildlife habitat, recreation and tourism resources, and abundant water resources. Approximately 44 percent of the area considered available for harvesting is located within watersheds licensed for consumptive use.

Crown range provides forage for both livestock and wildlife. In the TSA grazing occurs under the forest canopy as well as in early-seral stage openings where forage is temporarily available a few years following harvesting or fire.

Parks, recreation sites and trails, and roaded and non-roaded areas provide opportunities for numerous outdoor activities. There are many parks and recreation sites located in Arrow TSA. There is a range of recreational activities such as hiking, canoeing, camping, mountain biking, guided horse tours, fishing, hunting, snowmobiling and downhill, cross-country and backcountry skiing.

## First Nations

The Ktunaxa Kinbasket, Shuswap and Okanagan Nations have asserted traditional territories within the Arrow TSA, but no First Nations communities are located within the TSA.

## Regional economy

Approximately 44,575 people reside in the TSA region based on a 2011 census. About 50 percent of the population resides in the four major communities of Castlegar, Trail, Fruitvale and Rossland with a combined population of about 22,681. Other communities include Warfield, Nakusp, Salmo, Montrose, New Denver, Slocan, Winlaw and Silverton.

The most recent economic dependency estimates provided by BC Stats<sup>1</sup> show that the main sources of employment in the Arrow Boundary area are the public sector (31 percent), forestry (19 percent) and tourism (14 percent).

**<sup>c</sup>Crown forest management land base (CFMLB)**  
*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. Under the direction of the KBHLPO, parks and small area-based tenures contribute to the accounting for biodiversity targets and are therefore included in the CFMLB.*

<sup>1</sup> 2006 Economic Dependency Tables for forest districts, Garry Hornes, BC Stats, February 2009.

The Arrow Timber Supply Area has a large processing sector with four lumber mills, one pulp mill, a veneer plant, and three post/pole operations. The district has seen a contraction in the number of timber processing facilities over the past 10 years.

The sawmill located in Slocan City shut down in the summer of 2011 due to the recession, lumber prices, exchange rates, and transportation costs, as well as diminishing demand for waste wood. The sawmill operated sporadically over the previous decade, with several lengthy shut downs due to poor markets. The 65-employee plant was owned by Springer Creek Forest Products at the time of shut down. The licence was purchased in 2013 by International Forest Products Limited (Interfor) and the volume associated with the tenure has been supporting an increase in production at Interfor's sawmill in Castlegar and has helped sustain the communities and businesses associated with that operation. The sawmill was eventually demolished in 2014.

*Table 1. Major primary timber processing facilities Arrow TSA (FLNRO Competitive and Innovation Branch 2015)*

Existing demand					
Mill number	Mill type	Company	Estimated annual capacity	Required log input in m <sup>3</sup>	Capacity assumptions
62	Lumber mill	International Forest Products Ltd.	185,000,000 board feet	665,397	240 days per year, two 8-hour shifts per day
50	Lumber mill	Kalesnikoff Lumber Co. Ltd.	103,000,000 board feet	370,464	240 days per year, two 8-hour shifts per day
626	Lumber mill	Porcupine Wood Products	53,000,000 board feet	190,627	240 days per year, two 8-hour shifts per day
957	Lumber mill	Gold Island Forest Products Ltd.	16,800,000 board feet	60,425	240 days per year, one 8-hour shifts per day
501	Pulp and Paper mill	Zellstoff Celgar Limited Partnership	428,000 tonnes	N/A uses sawmill residuals	345 operating days per year, 24 hours per day
51	Veneer mill	ATCO Wood Products	118,000,000 square feet 3/8" thick	233,285	240 days per year, two 8-hour shifts per day
390	Post mill	Box Lake Lumber Prod Ltd.	360,000 pieces		
677	Utility pole mill	Pacific Inland Pole & Piling Ltd.	29,000 pieces		
188	Utility pole mill	Paterson Pole Ltd.	6,000 pieces		
<b>Total</b>				<b>1,520,198</b>	

Note:

"Required log input" includes volume outside the Arrow TSA.

Numbers are based on: Major Primary Timber Processing Facilities in British Columbia 2014.

Conversion factors:

1 BDU = 2.4 m<sup>3</sup> log input;

LRF = 0.278 mfbm/m<sup>3</sup>;

Solid wood conversion factor = 1.61 m<sup>3</sup>/mfbm;

Raw log conversion factor = 2.234 m<sup>3</sup> raw/m<sup>3</sup> sawn (nominal);

One cubic metre (plywood) = 1130 square feet 3/8" thick.

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## Land-use planning

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The Arrow TSA lies within the area covered by the Kootenay Boundary Higher Level Plan Order (KBHLPO). Forest development in the TSA is required to be consistent with legally established goals and objectives of this higher level plan. The timber supply analysis assumes that forest management and timber harvesting will be consistent with the KBHLPO.

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## Forest management

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### Timber harvesting land base

As part of the process used to define the modelled timber harvesting land base<sup>f</sup> (THLB) in the timber supply analysis, a series of deductions are made from the TSA land base. Table 2 shows categories of land that are considered not to contribute to the THLB. The table presents the area of the categories within the gross TSA boundary and the area for each factor that is uniquely (i.e., no overlaps with other factors) considered excluded from timber harvesting.

The total area within the boundaries of the Arrow TSA is 1 285 631 hectares. The core area of the TSA excludes TFLs and is 816 115 hectares in size, of which approximately 61 percent – 499 018 hectares – is Crown forest management land base (CFMLB). About 31 percent of the CFMLB, or 19 percent of the core TSA, is included in the 156 509 hectares of THLB.

**<sup>f</sup>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 2. Arrow TSA land base classification

Land classification	Total area (hectares)	Percent (%) of total area	Unique area excluded (hectares)
<b>Total TSA</b>	<b>1,285,631</b>		
TFL	469,513	36.5% <sup>1</sup>	469,513
<b>Core TSA (excludes TFLs)</b>	<b>816,115</b>	<b>63.5%<sup>1</sup></b>	
Not administered by FLNRO	147,739	18.1%	147,739
High recreation area	1,534	0.2%	1,534
Non-productive and non-forest	209,810	25.7%	163,761
Roads, trails, power line		0.0%	4,066
<b>Crown forest management land base</b>	<b>499,018</b>	<b>61.1%</b>	
Parks	234,991	28.8%	159,669
Old growth management areas	92,241	11.3%	38,477
UWR no harvest zone	77,556	9.5%	3,973
Growth plot	116	0.0%	75
Research plot	226	0.0%	63
Conservation	39,727	4.9%	1,556
Inoperable	362,938	44.5%	100,132
ESA1	92,939	11.4%	5,644
Low volume	54,164	6.6%	2,138
Low productive site	59,464	7.3%	1,947
Deciduous	43,827	5.4%	4,973
Riparian reserves and management areas		0.6%	4,676
Unstable terrain		1.0%	8,172
Problem forest type		0.3%	2,777
Wild life tree patch		1.0%	8,237
<b>Timber harvesting land base</b>	<b>156,509</b>	<b>19.2%</b>	
Future roads		0.4%	3,384

<sup>1</sup>Percent based on Total TSA. Otherwise, percent based on Core TSA.

Figure 2 shows the current age class distribution of forest stands in the CFMLB separated by THLB and non-THLB. The relatively large amount of young forest in the THLB reflects the past several decades of harvesting activities and fires. The large amount of non-THLB in the older forest classes reflects the non-timber management objectives.

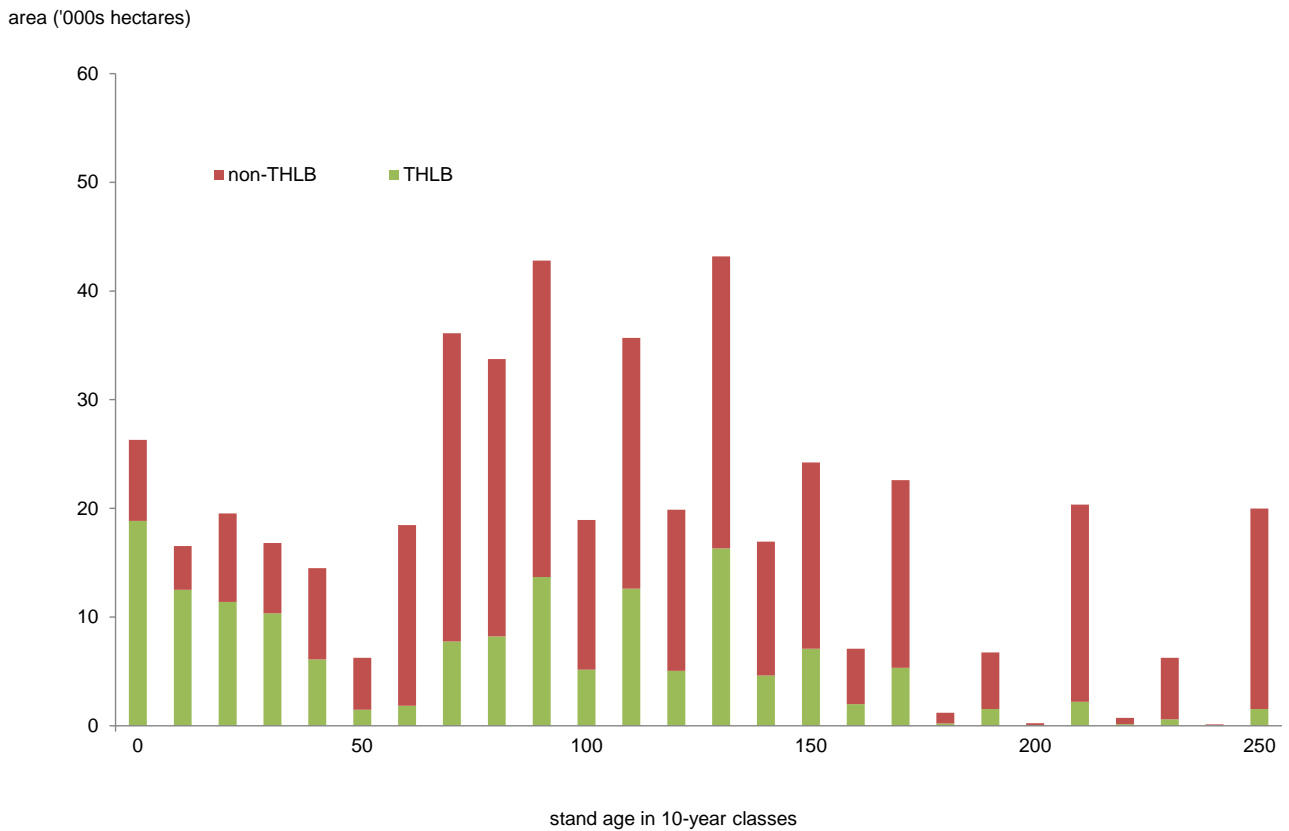


Figure 2. Age class distribution for the Crown forest management land base in the Arrow TSA.

Figure 3 summarizes the area and the volume by leading species on the THLB. Douglas-fir is the most common species.

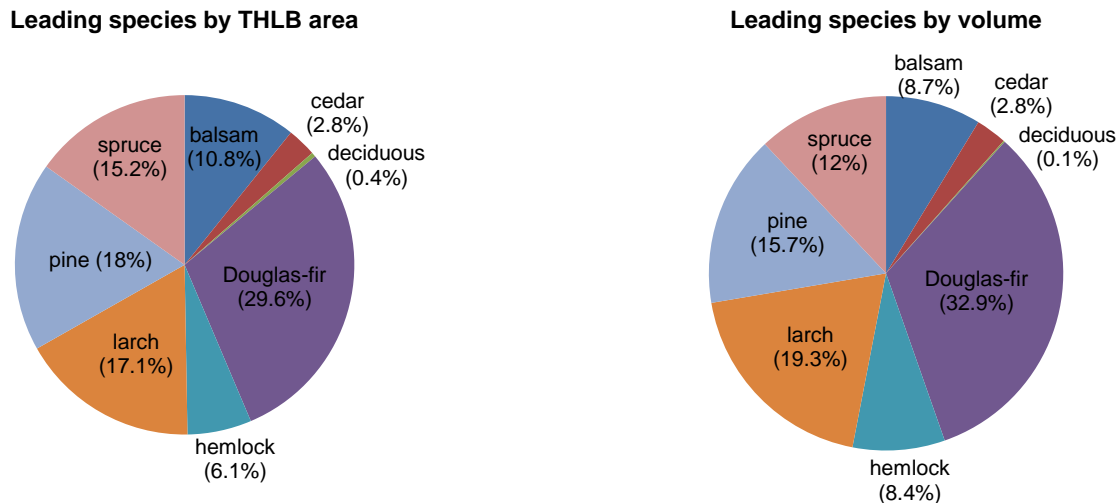


Figure 3. Leading species composition of the timber harvesting land base – Arrow TSA.

The total THLB volume is 33 million cubic metres with 30 million cubic metres located in mature stands.

### Land base and forest management changes since 2005

Since the last AAC determination in 2005, several changes have occurred to the land base and forest management practices, including:

- New Ungulate Winter Ranges (UWR) were established under the Government Actions Regulation (GAR) on December 13, 2005 for the protection of Mule Deer, white tailed deer, Rocky Mountain elk and moose winter habitat.
- New UWR was established under GAR on February 12 and 19, 2009 for the protection of mountain caribou habitat.
- Scenic areas and visual quality objectives were established under the GAR on December 31, 2005.
- Several new Wildlife Habitat Areas (WHA) have been established under the GAR for the protection of identified wildlife. Species with established WHAs include Western Screech Owl, Grizzly Bear, and data sensitive species.
- Vegetation Resource Inventory (VRI) Phase 2 inventory adjustment sampling which was undertaken in 2004 and 2005 suggests the overall volumes in the Arrow TSA inventory are underestimated.
- New Predictive Ecosystem Mapping (PEM) with accompanying site index by BEC (SIBEC) estimates of site productivity (SI) was recommended for use for the Arrow TSA on June 3, 2015.
- Two Community Forest Agreements were awarded since the previous timber supply review. The lands within the community forest agreements are excluded from the land base of the TSA.
- Woodlot areas have increased in the TSA due to area top-up. These new woodlot area increases are excluded from the land base of the TSA.
- The Cascadia TSA, established in 2011, comprises area that was formerly within the Arrow TSA. The boundaries of the Arrow TSA were changed to remove Crown land that was added to the Cascadia TSA.
- There has been a long history of forest operational planning delays and harvesting deferrals in the Slokan Valley due to a number of issues. Approximately half of the “contentious area” identified in the Slokan Valley in previous TSRs is now included in a new community forest agreement.

- Licensees and FLNRO have mutually agreed on the location of the non-legalized OGMA. Licensees have incorporated language to manage and respect the spatial, non-legalized OGMA in their respective Forest Stewardship Plans (FSP).
- Wildlife tree patch (WTP) area has increased from 2.5 percent to 5.0 percent.
- The maximum disturbance limit in integrated resource management areas increased from 25 percent to 33 percent.
- The maximum equivalent clearcut area limit for both domestic and community watersheds increased from 20 percent to 30 percent.

## History of the allowable annual cut

The allowable annual cut (AAC) for the Arrow TSA was first established in 1981 at 640 000 cubic metres.

In 1983, the AAC for the Arrow TSA was reduced to 619 000 cubic metres to reflect the creation of Valhalla Provincial Park and this AAC level was maintained in the 1995 determination. The 2001 AAC determination reduced the AAC to 550 000 cubic metres, and this AAC level remained in the July 1, 2005 determination.

On December 11, 2011, the AAC was automatically reduced to 513 700 cubic metres under the AAC Administration Regulation to account for a new Community Forest Agreement.

Two AAC uplifts under the Innovative Forest Practices Agreement were granted between 2008 and 2016 ranging from 34 000 cubic metres to 22 000 cubic metres.

Table 3 shows the harvest performance in the Arrow TSA since the last AAC determination.

*Table 3. Harvest performance since the last AAC determination*

Year	Total harvest volume (m <sup>3</sup> /year)*
2004	671,644
2005	579,504
2006	559,546
2007	558,925
2008	607,712
2009	535,029
2010	590,826
2011	498,414
2012	709,857
2013	504,084
Total	5,815,541

\*Source: HBS Mark Monthly Scaling History-fiscal year based, including CFAs.

**Timber supply analysis**

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For most AAC determinations, a timber supply analysis is 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 decrease or increase, 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' projection and forms the basis for comparison when assessing the effects of uncertainty of the information modelled on timber supply. The base case is designed to reflect current management practices.

Because it represents only one in a number of possible projections, and because it incorporates information and modelling assumptions about which there may be some uncertainty, the base case is not an AAC recommendation. Rather, it is one possible timber supply projection, whose validity - 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.

**The base case**

In the base case (Figure 4), the initial harvest level of current AAC (excluded community forests) of 520 000 cubic metres was maintained for the first 80 years. Managed stands are projected to provide almost the entire harvest by year 80 and were able to support an increase to the stable long-term harvest level of 580 000 cubic metres per year.

Scenarios showing other possible transitions between the current and long-term are provided as alternate harvest flows.

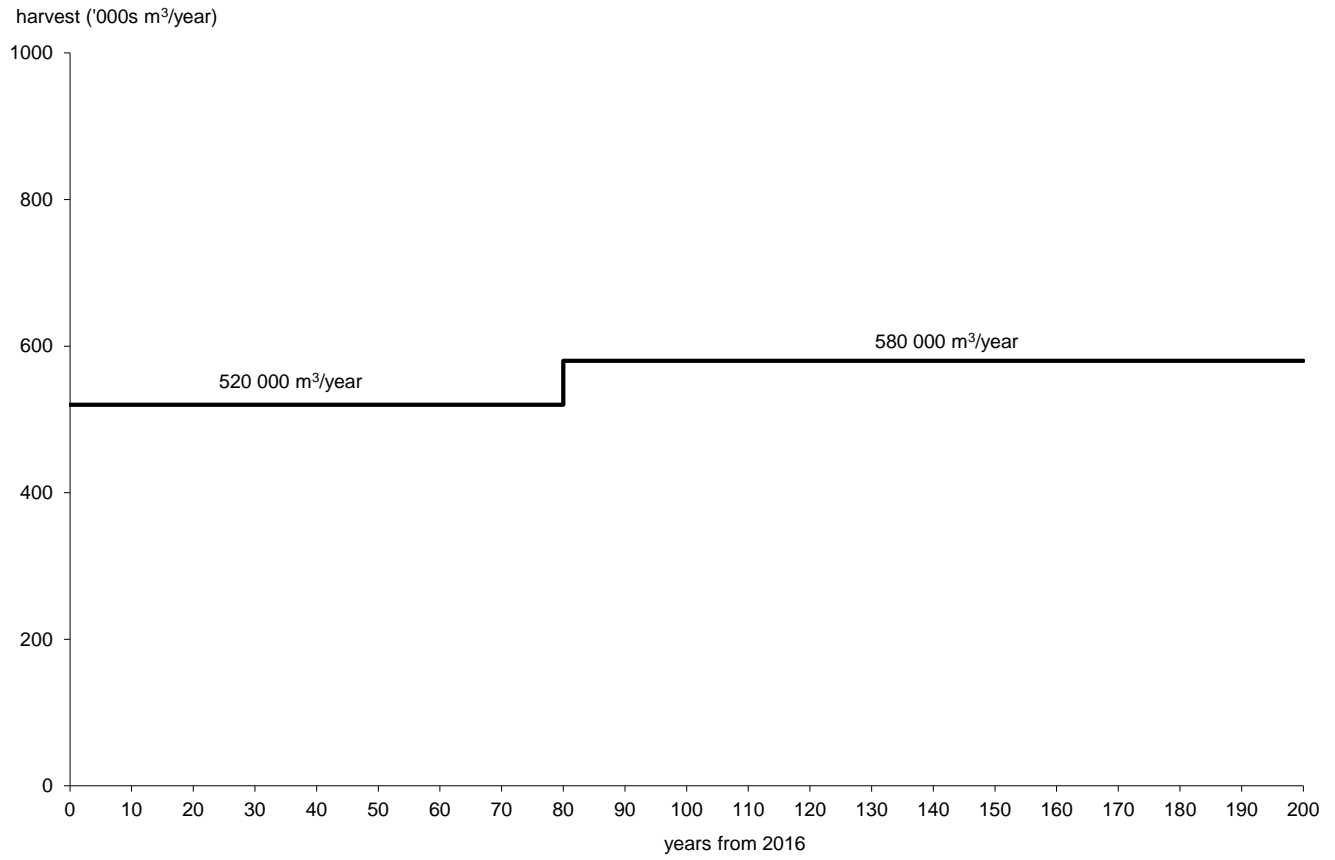


Figure 4. Base case forecast – Arrow TSA, 2016.

**Alternative harvest flows**

The base case is one of many alternative harvest flows possible. Figure 5 presents two alternatives that demonstrate how changing the initial harvest level or changing the assumptions can affect the projected harvest levels in the following decades.

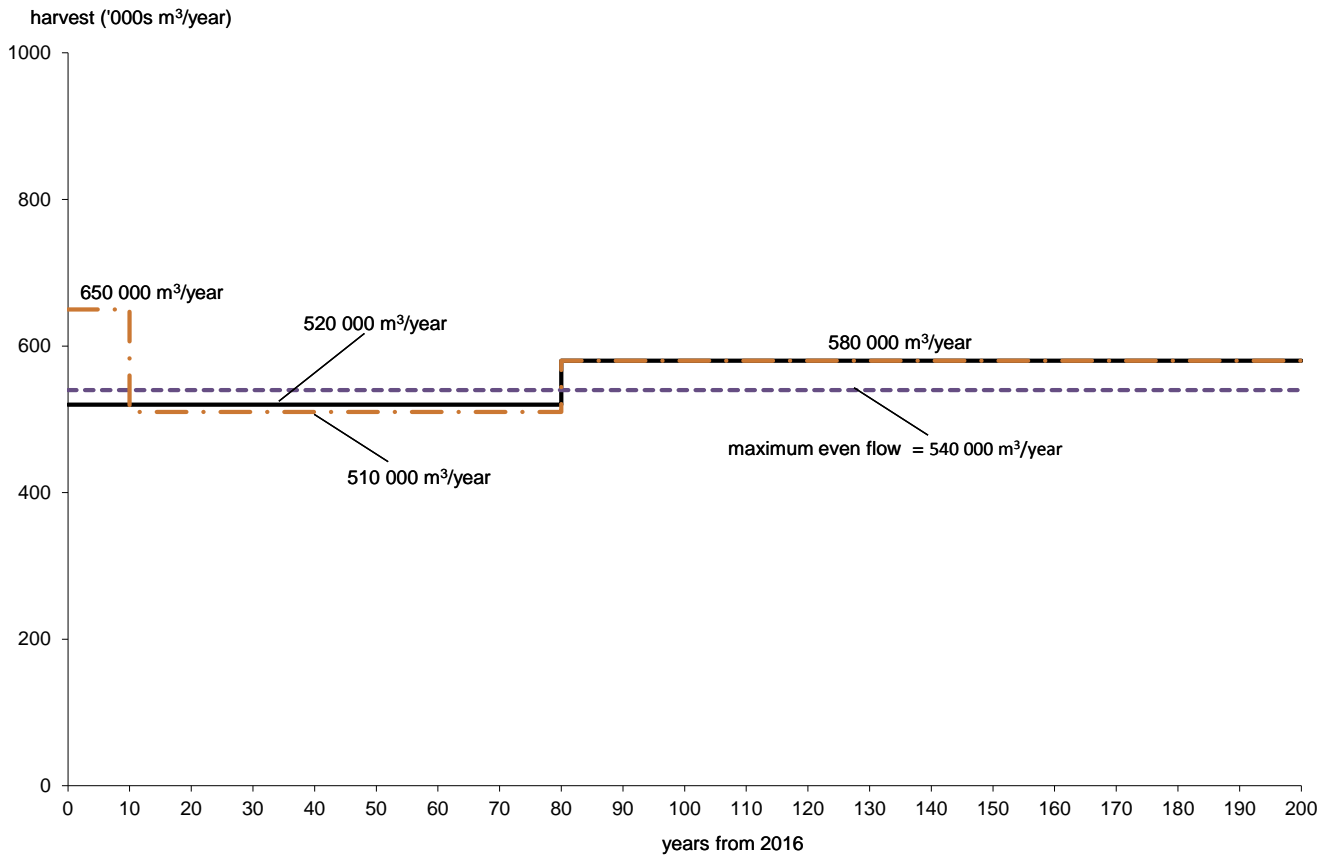


Figure 5. Alternative harvest flows – Arrow TSA 2016.

**Highest even-flow**

- The maximum even-flow harvest level is 540 000 cubic metres and it is higher than the base case current harvest level but the long-term level is lower than that the base case.

**Use higher harvest level for the next 10 years**

- If the first 10-years harvest level is increased to 650 000 cubic metres, the next 60-years harvest level would be 510 000 cubic metres and only slightly lower than that of the base case. The long term is not changed.

Attributes of the base case

Figure 6 shows that in the base case, managed stands start to contribute to harvest at year 50. At year 80 about 94 percent of the harvest comes from managed stands.

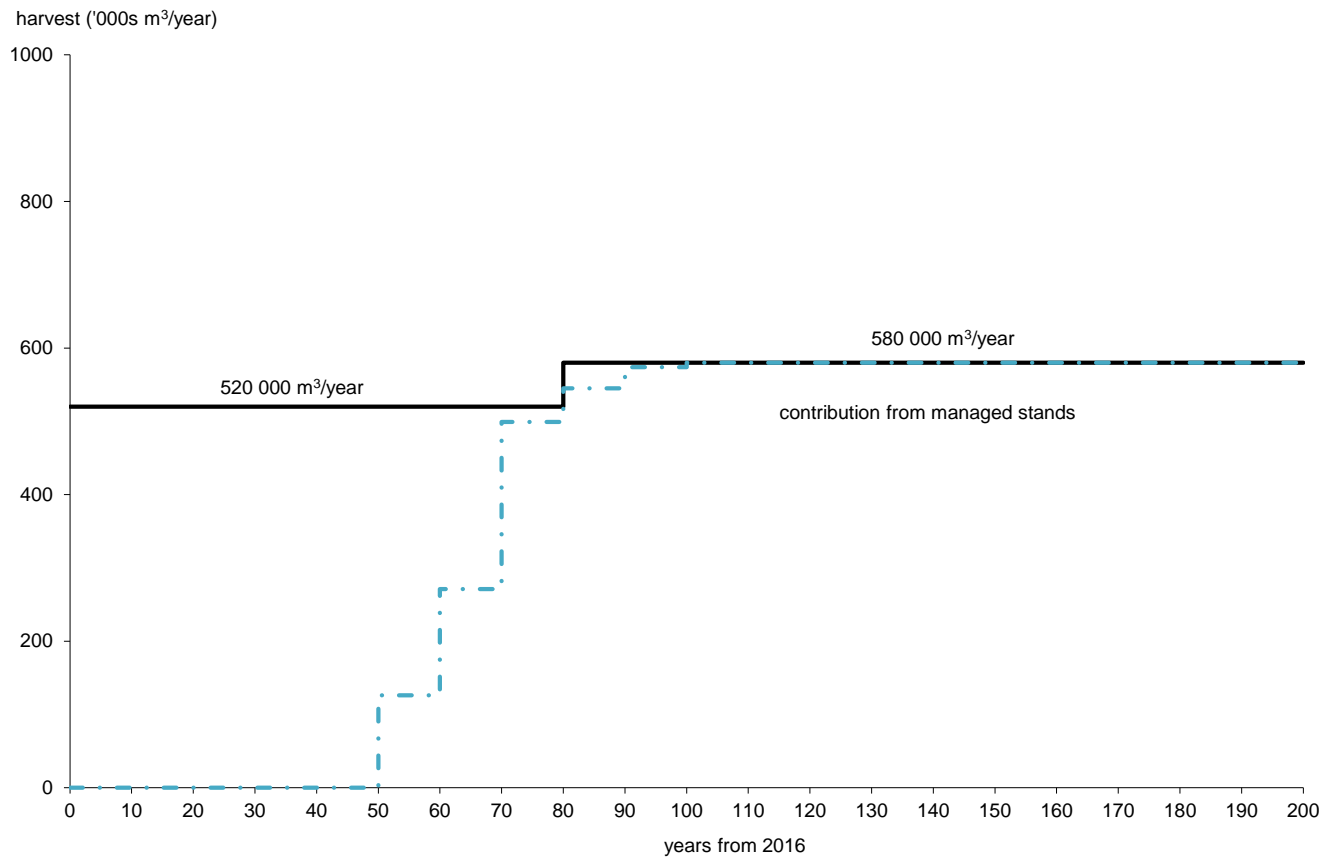


Figure 6. Contribution of managed stands in the base case – Arrow TSA, 2016.



Figure 7 shows that the total volume of growing stock today is about 33 million cubic metres. Following a small decrease over the first 40 years of the planning horizon the total volume of growing stock rebounds to a long-term stable level of 34 million cubic metres.

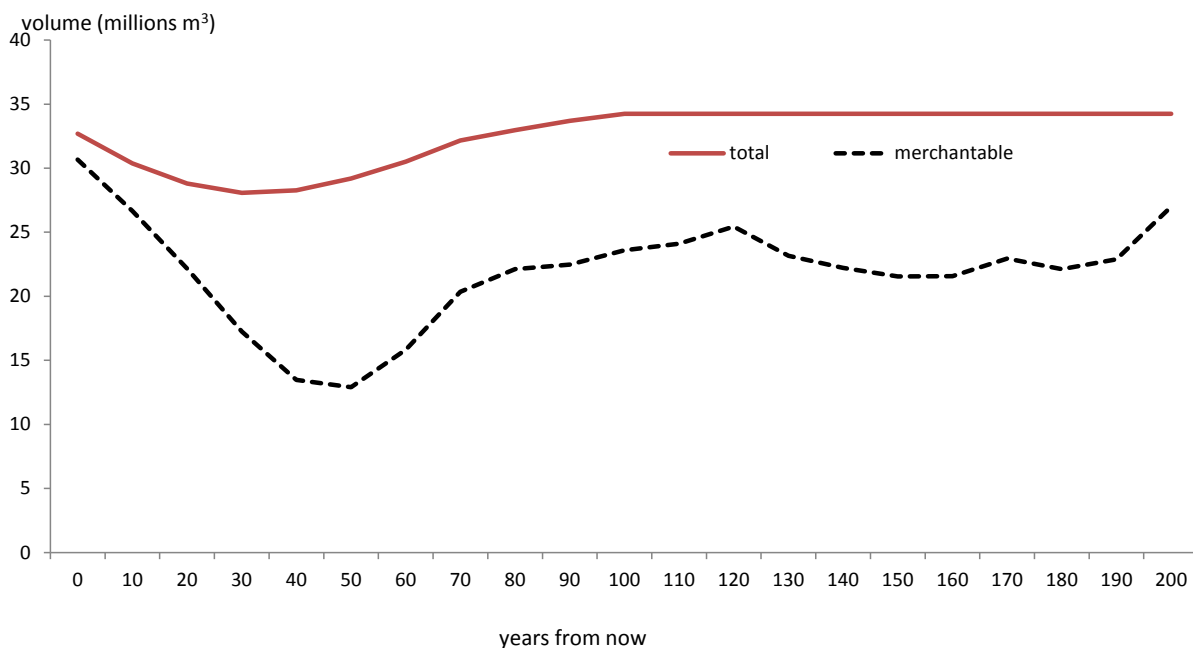


Figure 7. Growing stock of the base case — Arrow TSA, 2016.

Figure 8 shows the average harvest age and average volume harvested. The average harvest age is approximately 75 years over the long term. The large amount of mature forest older than 100 years continues to age over the period between 10 and 50 years, causing the average harvest age to increase from about 90 years to about 150 years over that time. Note that the minimum harvest age is 60 year over the entire forecast horizon.

The average harvest volume per hectare increases from about 270 cubic metres to 400 cubic metres. The long-term average harvest volume per hectare is higher than current average harvested volume per hectare which reflects the site index change and genetic gain.

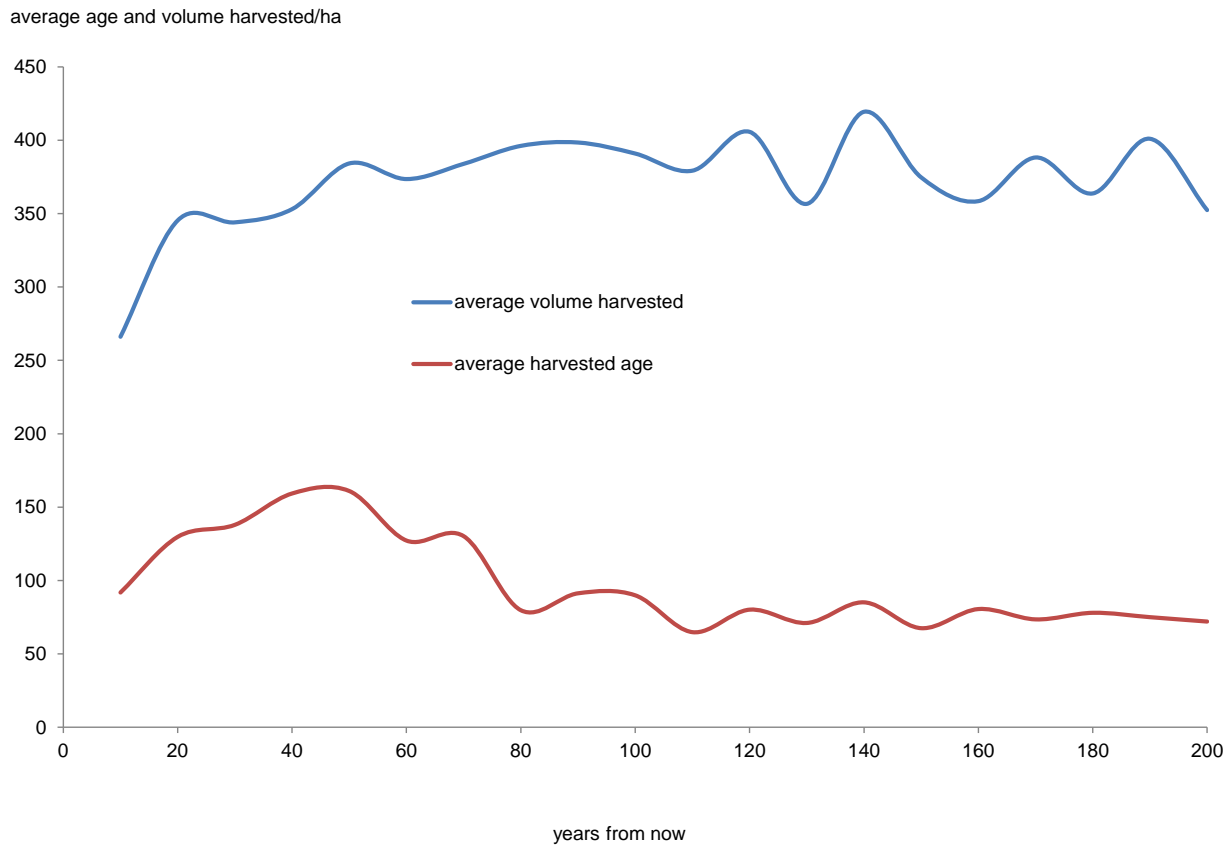


Figure 8. Average harvest age and volume of the base case — Arrow TSA, 2016.

Figure 9 shows that the area harvested is higher today, reflecting lower average volume from the stands harvested.

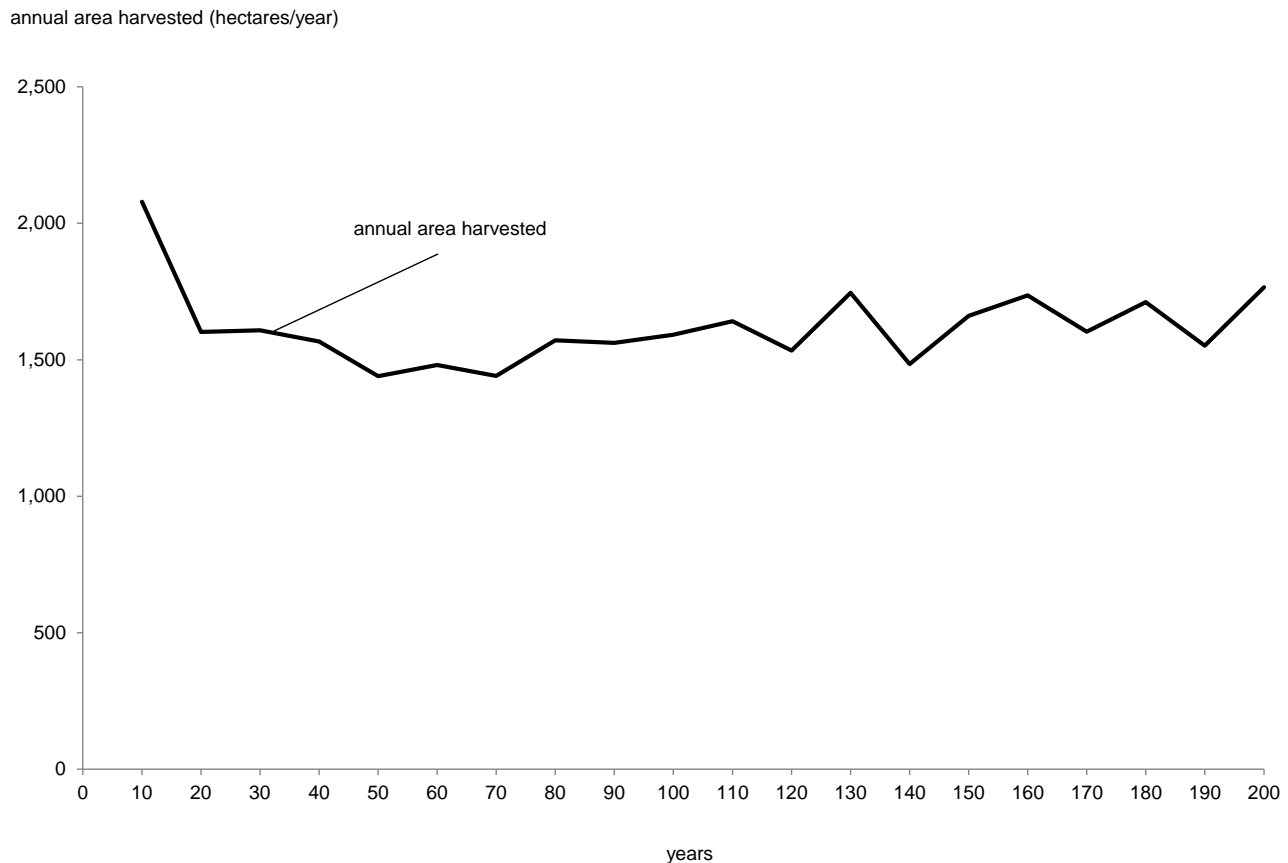


Figure 9. Average harvest area of the base case — Arrow TSA, 2016.

### 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 Arrow TSA, there is uncertainty about some management information and the modelling framework. Therefore, sensitivity analyses are used to provide further understanding by examining the effect on timber supply of uncertainty in data and assumptions. The key issues for the Arrow TSA timber supply review are:

- The Enterprise Creek drainage has been inaccessible for the last decade due to a major slide on the highway that provides access to the area. The road conditions have been expected to remain unchanged for the foreseeable future however, recent plans to temporarily open the road have been seriously considered by Interfor, the tenure holder operating in the area. Sensitivity analysis tested the removal of this area from the THLB.
- The area left for wildlife patch on some harvested areas exceeds five percent. Sensitivity analysis tested wildlife tree retention of seven percent.
- A study shows that the hydrological green-up recovery height for community and domestic watersheds may need to be nine metres instead of six metres. The study also suggested a 15 metre hydrological cover constraint. Sensitivity analysis tested the two sets of higher requirements.
- Access to the Slocan valley remains a contentious issue that is still not fully resolved. However, the licensee in the area has located some harvest blocks in the contentious area.

- The high genetic gain used in future managed stand yield tables has not yet been verified. Sensitivity analysis tests the use of current genetic gain in future managed stand yield tables.

The results of the sensitivity analyses completed are summarized in Table 4 below.

*Table 4. Adjusted harvest flow sensitivity analyses where current-term = years 0-79, long-term = years 80-200*

Issue tested	Sensitivity levels	Percent impact	
		Current term	Long term
Enterprise Creek access	Exclude the Enterprise Creek access area from THLB.	-0.3	-0.6
Wildlife tree retention	Increase wildlife tree retention from 5% to 7%.	-2.9	-2.5
Community and domestic watersheds	Increase minimum hydrological green-up recovery height from 6 metres to 9 metres.	-0.7	-0.6
Community and domestic watersheds	Increase minimum hydrological green-up recovery height from 6 metres to 15 metres.	-2.1	-2.1
Slocan Valley contentious area	Exclude Slocan Valley contentious area from THLB.	-4.4	-3.2
Genetic gain	Use the current weighted genetic worth values for future stands.	-0.6	-6.3
Planting density	Increasing plant density to 2000 seedling per hectares in all future stands on good and medium sites in moist, wet ICH/ESSF and lower ESSF analysis units.	0	+5

Two additional sensitivity analyses were conducted. The impacts of adding 2748 hectares of juvenile spacing and excluding the Protected Area Strategy-Goal 2 from the THLB (88 hectares are negligible).

## Wildlife habitat supply analysis

The timber supply review process will include a habitat availability analysis for Grizzly Bear, American Marten, and Northern Goshawk. The completed timber supply analysis provides a projection of the inventory attributes over time which can now be used in the habitat supply analysis. The results of the habitat analysis will be presented along with the timber supply analysis results for consideration by the chief forester at the AAC determination meeting.

## Summary

The base case has an initial harvest level of 520 000 cubic metres per year until year 80 and long-term harvest level of 580 000 cubic metres per year for the rest of the planning horizon.

The alternative maximum even-flow projection demonstrates the robustness of timber supply in the Arrow TSA.

Excluding the Enterprise Creek access area from the THLB has a negligible effect on timber supply. However, excluding the Slocan Valley contentious area reduces the first decade harvest level by 4.4 percent.

Increasing wildlife tree retention reduces the first decade harvest approximately in proportion to the increase in retention requirements.

Increasing the hydrological green-up recovery height to nine metres has a negligible effect, but increasing it to 15 metres reduces the harvest projection by 2.1 percent.

Reducing genetic gain in future managed stand yield tables only has a significant effect in the long term.

Although the above timber supply analysis is a significant source of information provided to the chief forester for consideration, the chief forester's AAC is not a calculation solely based on this strategic level analysis. The AAC determination of the chief forester is an independent judgment based on professional experience and consideration of the broad range of social, economic and environmental factors required under Section 8 of the *Forest Act* in addition to the timber supply analysis.

## Your input is needed

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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 Arrow TSA.

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

Your comments will be accepted until November 21, 2016.

You may identify yourself on the response if you wish. If you do, you are reminded that responses will be subject to the *Freedom of Information and Protection of Privacy Act* and may be made public. If the responses are made public, personal identifiers will be removed before the responses are released.

For more information or to send your comments, contact:

Selkirk Natural Resource District  
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Nelson, BC, V1L 6K1  
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If you have any comments or questions, contact:

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Further information regarding the technical details of the timber supply analysis is available on request by contacting: [Forests.ForestAnalysisBranchOffice@gov.bc.ca](mailto:Forests.ForestAnalysisBranchOffice@gov.bc.ca)

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