

# Integrated Resource Management Plan Arrowsmith Timber Supply Area

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## DRAFT Situation Analysis

V 1.3

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## **1 Introduction**

The Resource Practices Branch (RPB) of the Ministry of Forests, Lands and Natural Resource Operations (FLNRO) aims to develop a new management unit planning framework; Integrated Resource Management Plan (IRMP). The IRMP is a sustainable forest management planning framework with the objective to integrate all aspects of landscape-level and operational planning for each Timber Supply Area (TSA).

The IRMP will integrate Type 4 Silviculture Strategies with timber supply review (TSR) to reduce duplication and redundancies where possible by sharing inventories, management zones, analysis units, Timber Harvesting Land Base (THLB) definitions and management assumptions. It is expected that the IRMP process will improve the linkages to landscape level fire management, the Cumulative Effects Framework, the Forest and Range Evaluation Program's (FREP) multiple resource values assessments (MRVA) and other regional, management unit level or landscape level plans and strategies.

The IRMP aims to improve resource planning in British Columbia by addressing specific issues such as:

- ❖ Species at risk management and reserve allocation. Are the reserves placed, where they provide the conditions most needed by species at risk?
- ❖ Ability to investigate options to co-locate reserves to provide required habitat benefits while preserving or increasing harvest opportunities;
- ❖ Current and predicted harvest levels – are the assumptions regarding the transition from old growth stands to second growth and managed stands accurate and, if not, what are the possible impacts on timber harvest and habitat values?
- ❖ What options are available to address habitat and timber supply using silvicultural treatments?
- ❖ Effective use of public funds for new and existing funding initiatives;
- ❖ A feedback loop for adaptive management; ability to assess decision outcomes and modify behaviour based on new and better information; and,
- ❖ First Nations consultation; better understanding of the expected impacts of planned activities.

Before developing the IRMP framework the Ministry initiated Type 4 Silviculture Strategies in several TSAs most seriously impacted by the mountain pine beetle and wildfires. A Type 4 silviculture strategy is a rationalized plan to guide public expenditures to improve future timber supply within a management unit. There are currently eight Type 4 Silviculture Strategies underway in the interior of BC that can, over time, be integrated with TSR and evolve into IRMPs.

This project in the Arrowsmith TSA is a pilot project and it will run in conjunction with the on-going TSR. The objective is to build an IRMP for the TSA over the next 2.5 years and use the project as a learning tool while expanding IRM planning to other TSAs<sup>1</sup>.

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<sup>1</sup> In others TSAs, the IRM process will be referred to as Integrated Silviculture Strategies.

## 1.1 Context

This document is the first of four documents that make up an IRMP. The documents are:

1. Situation Analysis – describes in general terms the current situation for the unit. The Situation Analysis forms the starting point for the initial planning group meeting to identify opportunities.
2. Data Package - describes the information that is material to the analysis including data inputs and assumptions.
3. Modeling and Analysis report –provides modeling outputs and rationale for choosing a preferred scenario.
4. Integrated Resource Management Plan – represents the preferred management scenario which is the basis for the first iteration of the IRMP. It includes an investment strategy and provides treatment options, associated targets, timeframes and expected benefits.

When the IRMP is complete, a spatial operations schedule will provide direction for harvesting and a land base investment schedule will guide Forest for Tomorrow Annual Operating Plans.

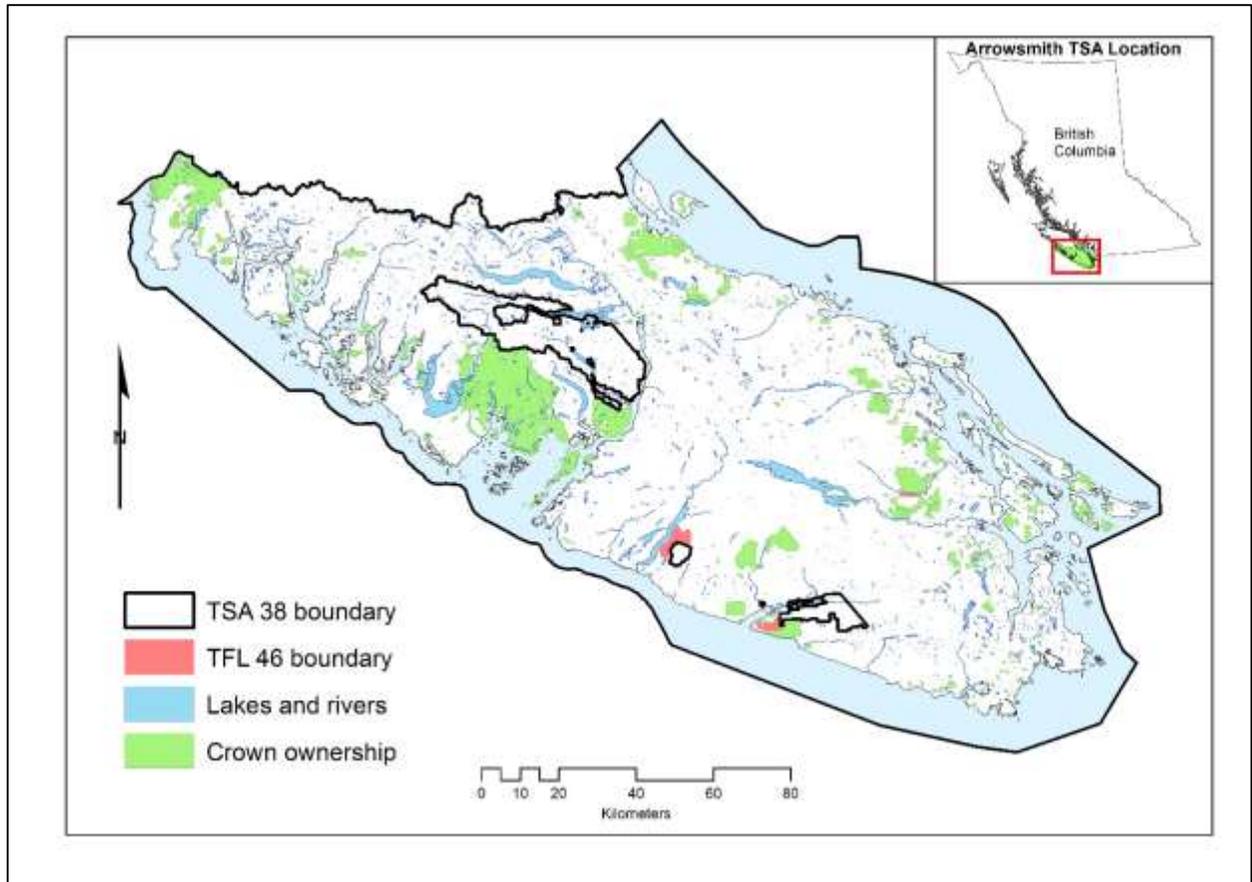
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## 2. Arrowsmith TSA

The Arrowsmith TSA is located on the southern half of Vancouver Island. It includes communities in four regional districts: the Alberni Clayoquot, Cowichan Valley, Nanaimo, and Capital Regional District. Other major population centres include Duncan, Ladysmith, Municipality of North Cowichan, Parksville, Qualicum Beach and Port Alberni; smaller communities include Tofino, Ucluelet, Lake Cowichan, Nanoose, Chemainus, Union Bay and Fanny Bay.

The Arrowsmith TSA is part of the West Coast Natural Resource Region of FLNRO and is administered by the South Island Natural Resource District.

The Crown land within the TSA is scattered with small parcels occurring from the east coast of Vancouver Island to Mooyah Bay in the north. The total area of Crown land is 159,214 ha, of which 4,127 ha is within the TFL 46 takeback area. Figure 1 shows the Crown ownership areas within the TSA.

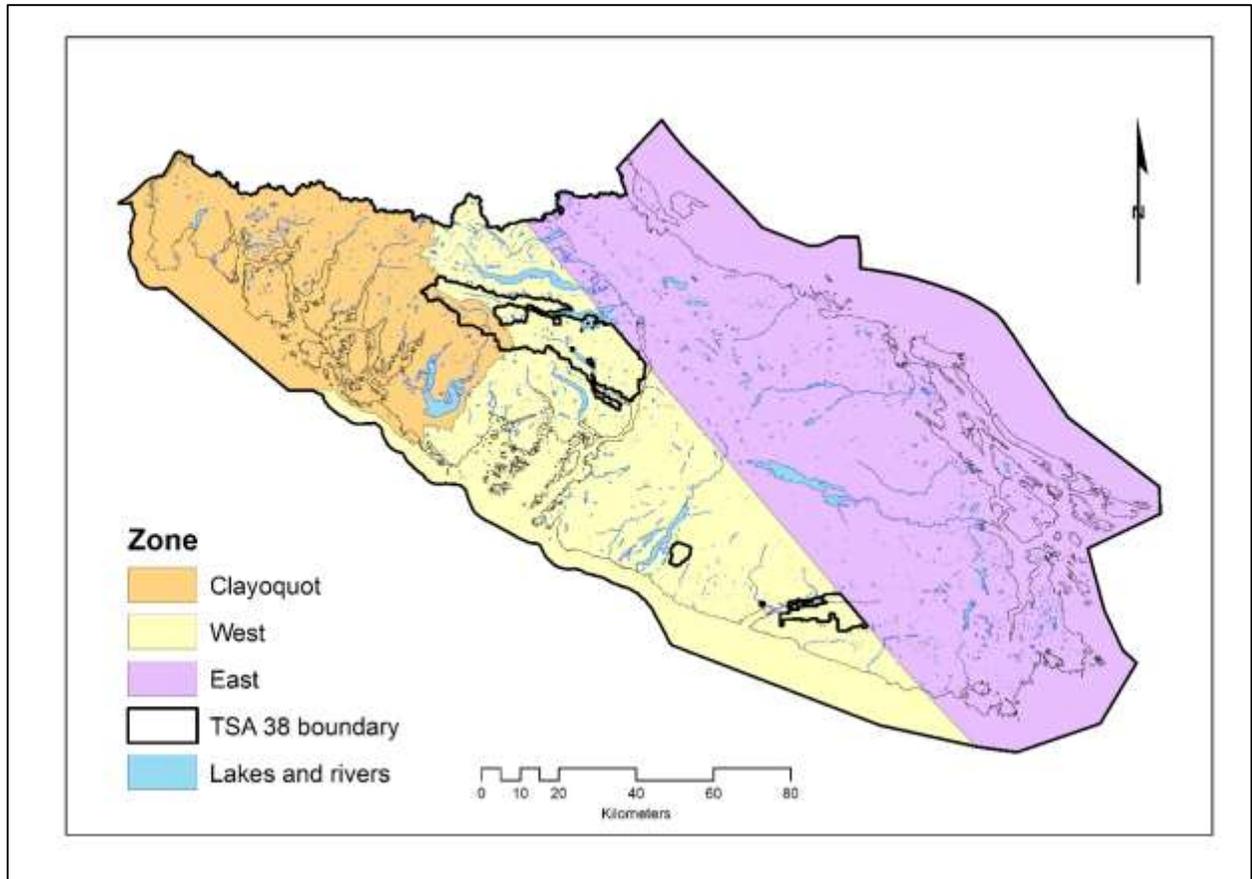


**Figure 1: Arrowsmith TSA**

## 1.2 Management Zones

The TSA is divided into 3 zones: East, West and Clayoquot. The East zone has a long harvest history with extensive areas of managed second growth forests. Forests in the East zone are located near communities and often form community interface areas.

The forests in the West zone are generally older and more isolated; second growth forests where they exist are young and will not be available for harvest for some time. In the Clayoquot zone, timber harvesting and resource management is strictly governed as discussed below. The management zones are shown in Figure 2.



**Figure 2: Arrowsmith TSA management zones**

### **3 Summary of Current Plans and Strategies**

The management of natural resources in the Arrowsmith TSA is directed by the Vancouver Island Land Use Plan (VILUP) and the Clayoquot Sound Watershed Plans.

#### **3.1 Vancouver Island Land Use Plan (VILUP)**

The Vancouver Island Land Use Plan (VILUP) and associated Higher Level Plan Order (HLPO) direct resource management on all Crown land within the Arrowsmith TSA outside of the Clayoquot Sound Land Use Decision area and the Gulf Islands. The VILUP and HLPO designate three management zones: Special Management Zones (SMZ); Enhanced Forestry Zones (EFZ) and General Management Zones (GMZ).

According to the latest TSR (Timberline, 2008), the SMZ accounts for approximately 12 638 ha (18 %) of the THLB in the Arrowsmith TSA. The SMZs within the TSA are: Barkley Sound, Alberni Canal, San Juan Ridge, Upper Qualicum and Nahmint. The SMZs require higher level of mature and old seral retention than other zones and apply a three-metre green-up height within each SMZ.

The EFZ with the objective of enhanced timber production allows a shorter, 1.3 meter green-up height. The EFZ accounts for 11 885 ha (17 %) of the THLB in the TSA. The EFZs within the TSA are: Effingham, Maggie, Corrigan, Sarita and Loss-Jordan.

No special management is designated under the GMZ. Rather, general management under the Forest and Range Practises Act (FRPA) and other legislation apply to these areas.

### 3.2 Clayoquot Sound

Almost 90,000 ha or 34 % of Clayoquot Sound is preserved. This includes over 70,000 ha of coastal temperate rain forest. An additional 21 % of Clayoquot Sound is under special management emphasizing the protection of wildlife, recreation and scenic values. Some logging using retention systems is allowed.

The provincial government adopted the recommendations of the Clayoquot Sound Scientific Panel (CSSP) in 1995. The recommendations include completion of 15 watershed plans. Harvesting is not allowed within the plan areas as they are reserved for ecosystem representation, red- and blue-listed plant and wildlife species, cultural values, recreation, hydro-riparian resources, sensitive soils and unstable terrain and interior forest conditions. Areas outside of the watershed reserves are available for harvesting; however the CSSP recommendations specify the maximum rates of cut, old-seral forest requirements, visual quality objectives and variable retention harvest systems.

The total productive forest area in the Arrowsmith TSA portion of Clayoquot Sound is 18 865 hectares of which 7,347 hectares were deemed available for harvesting in the latest timber supply review (Timberline, 2008).

Since the recommendations of the CSSP, there has been little harvesting in the Clayoquot Sound area within the TSA. This is not expected to change in the short term.

### 3.3 Silviculture Strategies

Cortex Consultants Inc. completed a type 2 silviculture strategy for the Arrowsmith TSA in 2001 (Cortex Consultants Inc. 2001). The objective of the strategy was to provide strategic guidance to the district staff for designing and implementing an incremental silviculture program.

The type 2 strategy tested various scenarios against the base case. These scenarios focused on three objectives:

- ❖ Maximizing total timber supply;
- ❖ Maximizing the supply of larger dimension logs;
- ❖ Maximizing the supply of solid-clear wood.

The project quantified the projected changes in the timber supply of the TSA as a function of incremental silviculture at various levels of expenditure; however it did not design or recommend a specific silviculture program that should be followed.

Planting select stock was found to have a long-term timber supply impact of 13%, while spacing and fertilization increased the projected long-term harvest level by 11%. Commercial thinning contributed up to 4% to the long-term harvest forecast; however the impact was larger (up to 10%) in the short term and early mid term.

The analysis demonstrated that the harvest volume of larger stems (65+ cm) can be doubled by increasing the rotation ages past the culmination of mean annual increment (mai); however, this increase in quality comes at a cost. The long-term harvest level was reduced by 19%.

The type 2 strategy also illustrated that an extensive pruning program can increase the long-term harvest of solid, clear wood from zero to 9% of the total harvest.

### 3.4 Incremental Silviculture Program (2007 to 2013)

Table 1 shows the treated areas by incremental silviculture treatment for the Arrowsmith TSA between 2007 and 2013. Fertilization had been the treatment of choice with 6,790 ha treated (97% of total) over 7 years.

**Table 1: Incremental silviculture treatments (ha) by year 2007 - 2013**

Year	Fertilization	Juvenile Spacing	Pruning
2007	20	0	16
2008	1074	0	0
2009	1716	0	1
2010	877	26	26
2011	620	92	1
2012	1715	26	4
2013	768	0	0
<b>Total</b>	<b>6790</b>	<b>144</b>	<b>48</b>

### 3.5 Fire Management

The planning team will set the priorities for reducing fire hazards and risk for the Arrowsmith TSA. The focus will be on reducing fire hazards and risk adjacent to communities to protect life, properties and structures through planning of fire breaks, use of fire management stocking standards and providing recommendations for fuel management. The IRMP will be informed by the fire management planning process and any landscape level fire management plans and/or strategies that may be available.

### 3.6 Forest Health

The Forest Health Overview provides background and strategic direction for the management of forest health in the West Coast and South Coast Regions (FLNRO, 2015). It identifies damaging agents that have the potential to harm the forest resource and suggests strategies to reduce short- and long-term forest health losses.

Several health agents exist in the Arrowsmith TSA; however, few are significant. Mountain pine beetle was reported to have killed close to 4 million western white pine between 1940 and 1960 on southern Vancouver Island. A large outbreak of Western Hemlock Looper on southern Vancouver Island reported between 1945 and 1947 caused significant damage. Root diseases, especially *Phellinus* and *Armillaria* are currently the most important concern, followed by summer drought, risk of fire and losses to windthrow in partial harvest areas. Losses to root disease have been incorporated into past TSRs; the last TSR increased the operational adjustment factor OAF2 from 5% to 12.5% for all existing managed Douglas-fir leading stands in the CDF and CWHxm1 and 2 subzones. The OAF2 was increased from 5% to 10% for future managed Douglas-fir leading stands in the same subzones.

Dwarf mistletoe impacts hemlock in portions of the Coastal Western Hemlock zone. The incidence of dwarf mistletoe on hemlock is anticipated to rise as we move away from clear-cutting and

increase partial cutting with emphasis on irregular cutblock shape and tree retention. The reforestation regimes in these areas are designed to manage the mistletoe by planting resistant species.

### 3.7 Species Monitoring

In 2009, the chief forester provided direction on the need to understand current trends in species selection, developing species selection criteria for sustainable future ecosystems and setting up a monitoring framework for updated data. The percent share of harvest volume by species for the Arrowsmith TSA is illustrated in Table 2. Between 2003 and 2013 the majority of the billed volume was Douglas fir (53%) with hemlock and redcedar second and third at 22% and 14% respectively.

The planting practises in the TSA do not generally correspond well with the harvest billing data; the records indicate that 57% of the reforested area between 1997 and 2006 was planted with western redcedar while the share of Douglas fir was 28% (Table 2). Further investigation of the data reveals that the reforestation practises tend to match the records for the previous leading species quite well. Between 2002 and 2012 western redcedar was the leading species on 41% of the harvested area with Douglas fir second at 34% and hemlock third at 19%.

Silviculture survey data indicates that, while not generally planted in large quantities, the natural ingress of hemlock tends to bring the hemlock component in young stands to historic levels (not shown).

**Table 2: Harvest by species, previous leading species and planted species (source FLNRO, 2014)**

Species	Billed Volume 2003 - 2013	% of Volume	Previous Leading Species (% of Area) 2002-2012	Planted Species (% of Area) 2000-2010
Alder	109,418	1%	2%	1%
Balsam	998,066	8%	1%	2%
Cedar	1,696,402	14%	41%	57%
Cypress	294,202	2%	3%	4%
Fir	6,453,828	53%	34%	28%
Hemlock	2,700,194	22%	19%	5%
Maple	709	0%	0%	0%
Pine	1,418	0%	0%	1%
Total	12,254,236	100%	100%	100%

## 4 Timber Supply

### 4.1 Historical and Current AAC

The current AAC in the Arrowsmith TSA is 420,000 m<sup>3</sup> per year of which 6,300 m<sup>3</sup> is attributable to red alder-leading stands with at least 50 % deciduous species by volume, and 13,700 m<sup>3</sup> attributable to the Clayoquot Sound area. This AAC will remain in effect until a new AAC is determined, which is scheduled for September 2017.

**Table 3: Historical and current AAC**

AAC (m <sup>3</sup> )		1986	1989	1992	1996	2002	2004(April1)	2004 (April 22)	Current
		392,000	395,870	498,250	400,000	373,300	391,796	418,796	420,000
Partition	Deciduous		3,870		6,300	6,300	6,300	6,300	6,300
	Clayoquot				13,700	13,700	13,700	13,700	13,700

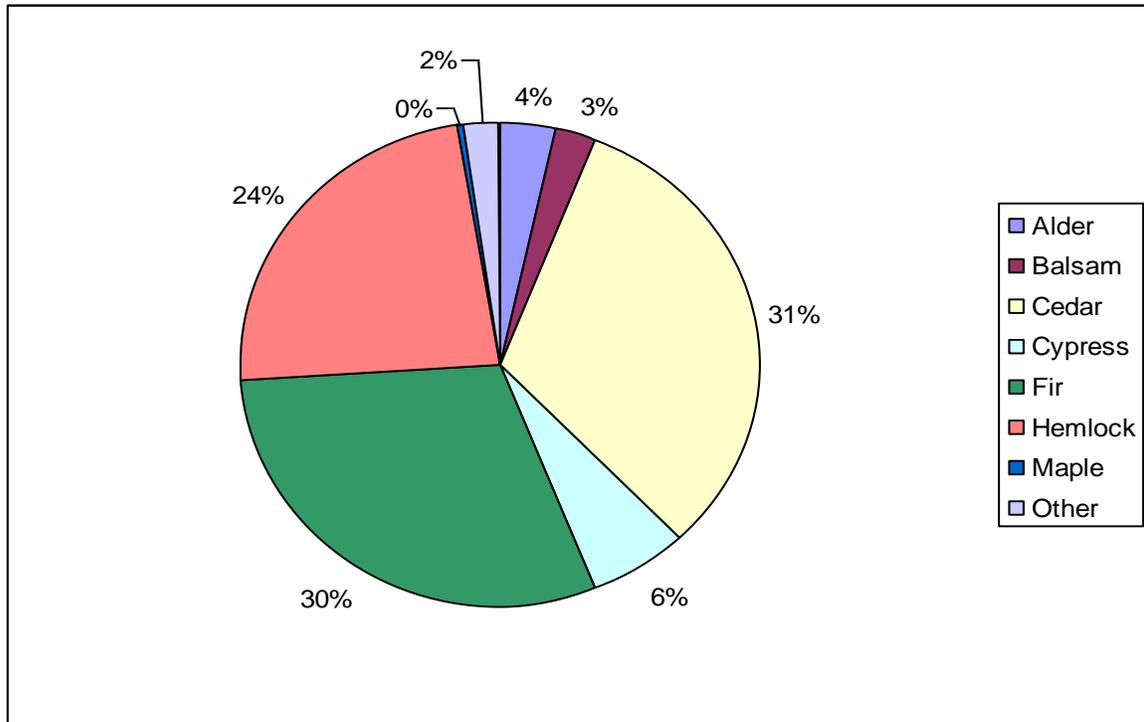
The harvest performance in the TSA has not met the AAC (Table 4). Over a six-year period from 2008 to 2014 approximately 84% of the available AAC has been harvested.

**Table 4: Billed volumes 2008 – 2014, Arrowsmith TSA**

Scale Year	Cedar	Fir	HemBal	Other Conifer	Deciduous	Total	% of AAC
2008	113,741	47,244	146,809	902	324	309,020	73.8%
2009	59,651	108,305	55,562	649	1,032	225,199	53.6%
2010	120,591	115,885	99,339	2,425	536	338,776	80.7%
2011	139,577	169,613	171,037	1,091	4,862	486,179	115.8%
2012	125,540	97,903	112,105	771	1,945	338,263	80.5%
2013	149,434	158,133	138,394	2,123	734	448,818	106.9%
2014	118,889	97,236	112,974	863	1,864	331,826	79.0%

### 4.2 Age Class Distribution and Species Profile

The forest management land base (FMLB) in the Arrowsmith TSA is dominated by western redcedar (Cw), Douglas fir (Fd) and western hemlock (Hw). Cw is the leading species on approximately 31 % of the FMLB area. The share of Fd is 30% while Hw is the dominant species on 24% of the land base (Figure 3).



**Figure 3: Leading species on the FMLB**

Older age classes dominate the FMLB in the TSA. Approximately 50% of the FMLB is older than 140 years of age (Figure 4). Age classes 6 and 7 are not well represented; future harvesting in the TSA will depend on the timber currently in age classes 3, 4 and 5, and available timber in age classes 8 and 9.

Western redcedar and yellow cypress (Cedar group) leading stands dominate the older age classes together with hemlock/balsam leading stands, while Fd leading stands are most common in younger age classes (Figure 4).

Younger Fd leading stands dominate the East zone (Figure 5), while old age class 8 and 9 Western redcedar/yellow cypress and hemlock/balsam leading stands are prevalent in the West zone (Figure 6). Note the fairly large area of younger (1 to 3) age classes in the West zone.

Age class 8 and 8 Western redcedar/yellow cypress and hemlock/balsam stands dominate the Clayoquot zone (Figure 7).

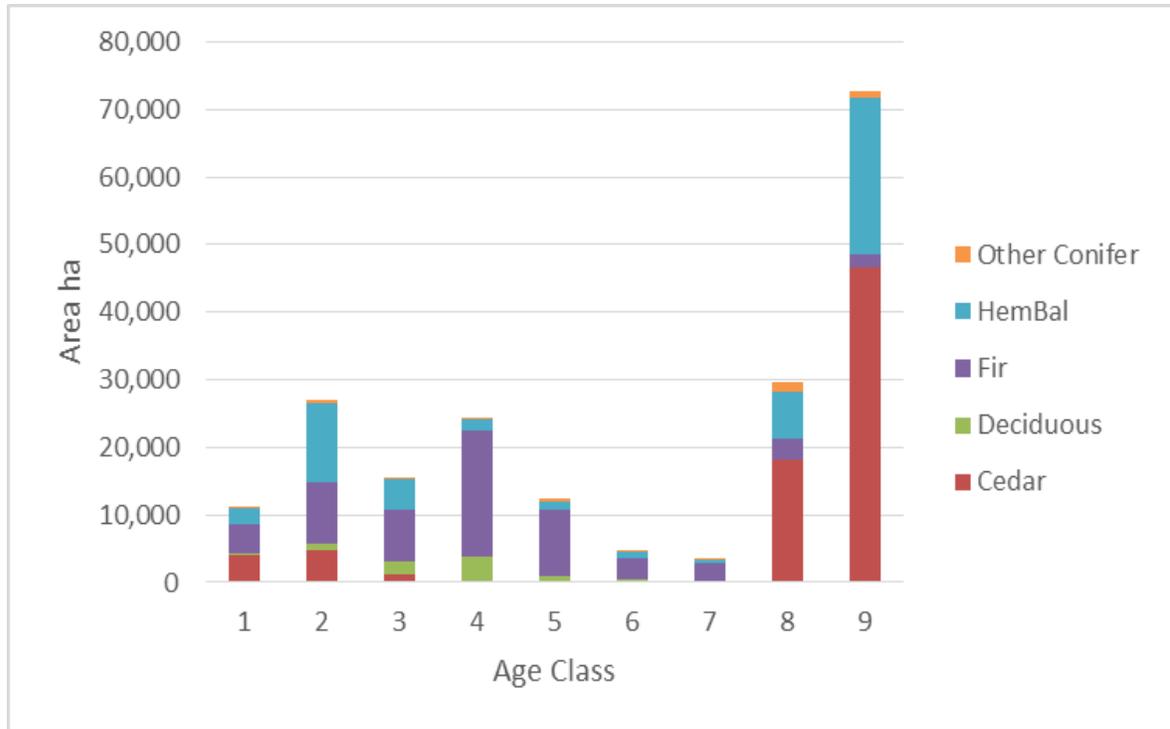


Figure 4: Age class distribution by leading species group on the FMLB; Arrowsmith TSA

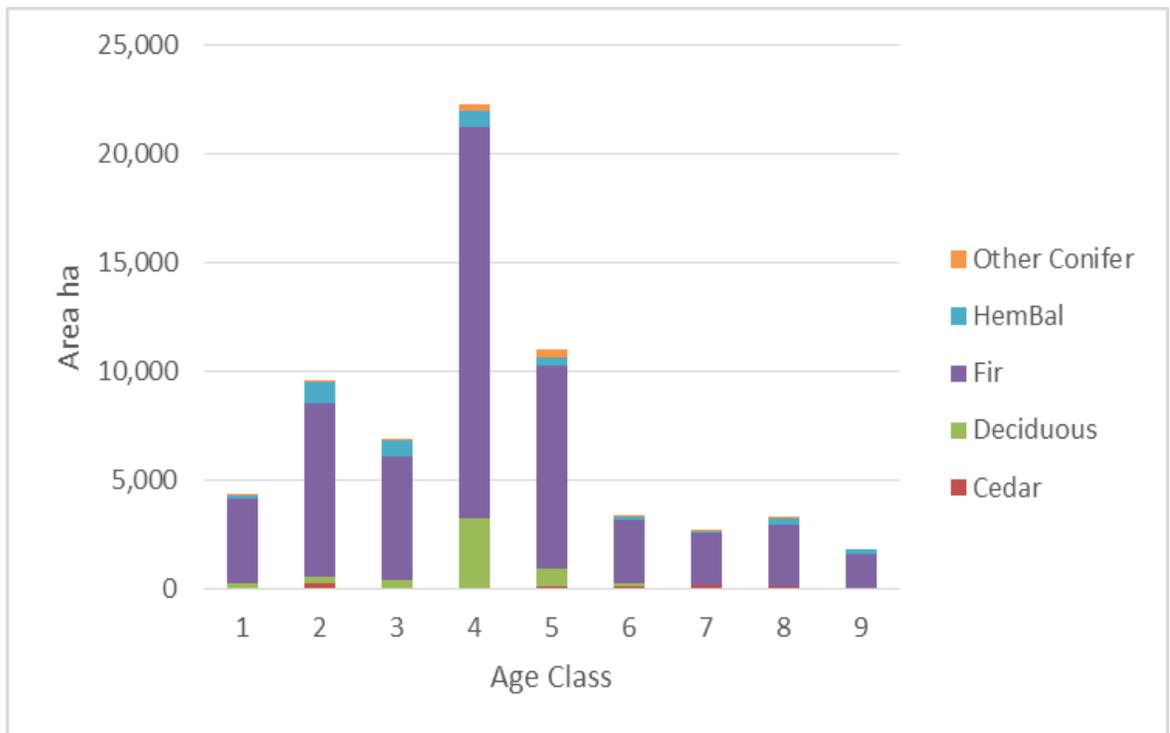


Figure 5: Age class distribution by leading species group on the FMLB; East zone

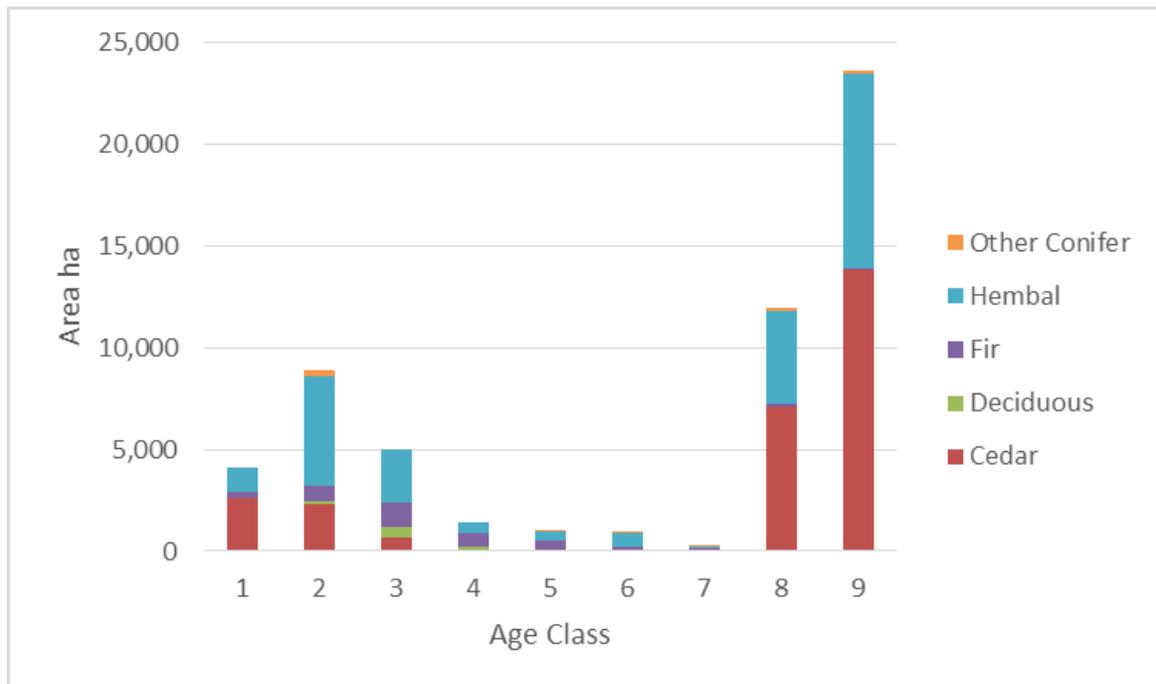


Figure 6: Age class distribution by leading species group on the FMLB; West zone

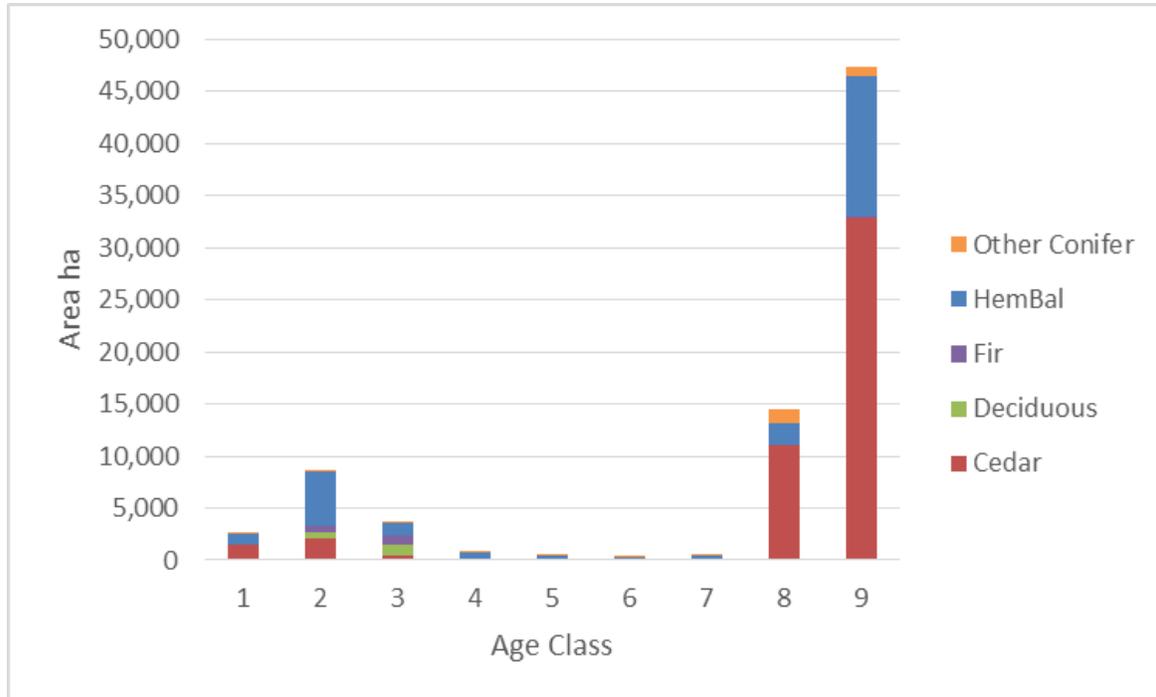


Figure 7: Age class distribution by leading species group on the FMLB; Clayoquot zone

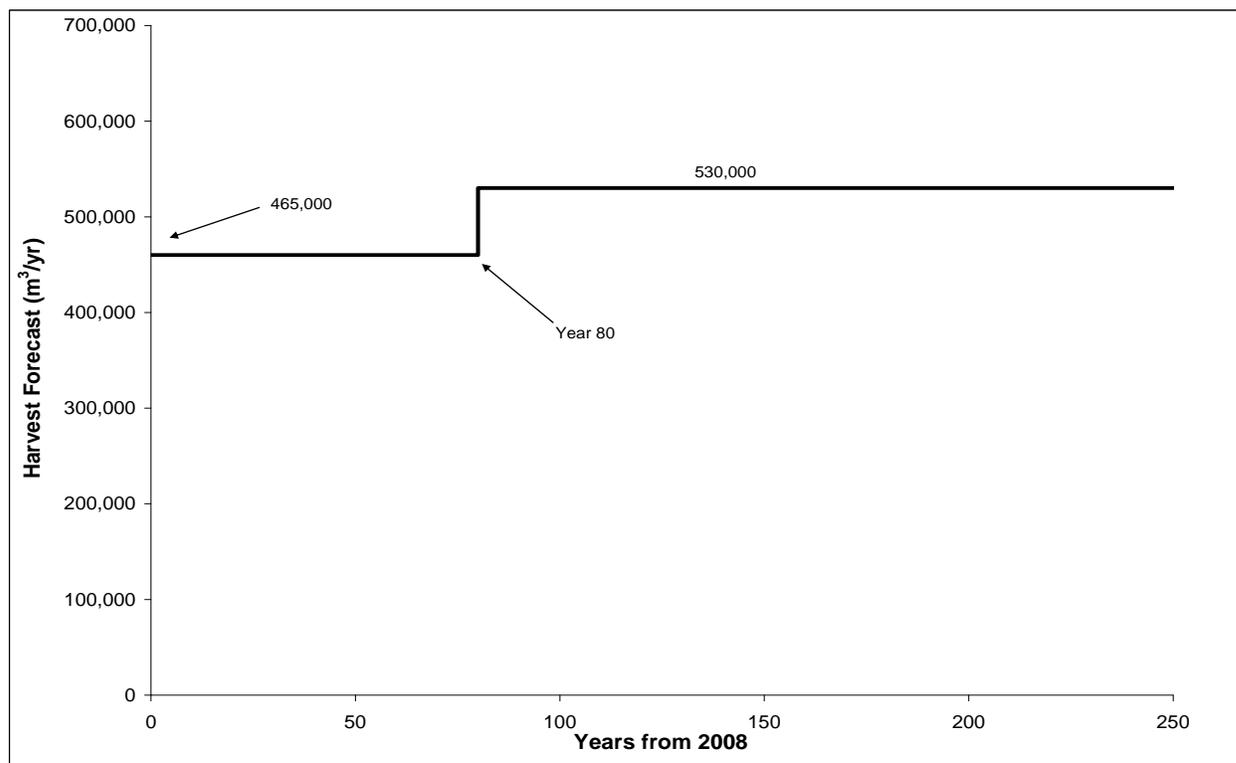
### 4.3 Current Timber Supply Situation

Figure 8 illustrates the harvest forecast for the Arrowsmith TSA from the latest timber supply review (TSR) in 2009. In the forecast the initial harvest level of 465,000 m<sup>3</sup> per year is maintained until year 80 when the long – term harvest level of 530,000 m<sup>3</sup> per year is reached.

As noted earlier in this document, the current AAC was set at 420,000 m<sup>3</sup> per year in 2009, not at the initial harvest level of the base case. In the opinion of the Chief Forester, the 2008 timber supply forecast may have overestimated the timber supply. In his determination he listed those factors that influenced his decision to set the AAC lower than the initial harvest level modeled in the analysis. These factors were:

- ❖ Underestimation of the forest cover retention requirements;
- ❖ Fragmentation of the Crown forest;
- ❖ Identified wildlife;
- ❖ Underestimation of the harvesting restrictions in riparian management zones; and
- ❖ First Nations cultural heritage resources and land interests.

Other factors, such as the Barkley Community Forest Agreement that was in place at the time of the AAC determination, were also considered; however, the impacts were mostly long term in nature.



**Figure 8: Timber supply forecast for the Arrowsmith TSA; TSR 3 2008**

### 4.4 Harvest Performance and Trends

As noted earlier, the harvest has not met the AAC between years 2008 and 2014; approximately 84% of the AAC was harvested during this time period. Figure 9 illustrates the past harvest in the TSA by management zone. Since 2008 the majority of the harvest has occurred in the west zone, with its annual share ranging between 53% in 2009 and 89% in 2012. There has been no harvest in the Clayoquot zone since 2008.

No clear trends exist for the harvest of particular tree species groups in the TSA. This can be seen in Figure 10; the harvest tends to be evenly distributed with cedar (Western redcedar and yellow cypress), Douglas fir and hemlock/balsam stands all contributing approximately one third to the total harvest. In the west zone, the harvest consists mostly of cedar and hemlock/balsam stands (Figure 11), while in the east almost the entire harvest comes from Douglas-fir stands (Figure 12).

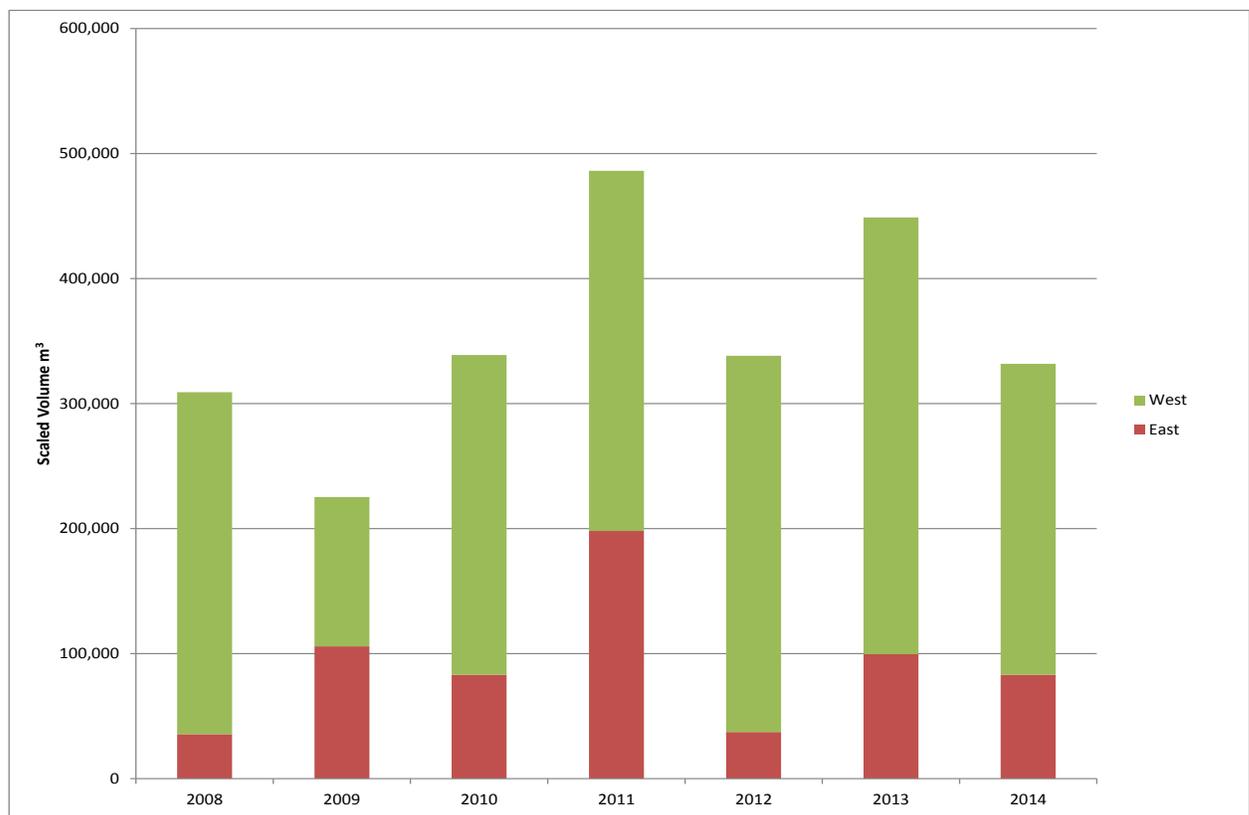


Figure 9: Harvest by management zone, Arrowsmith TSA 2008 to 2014

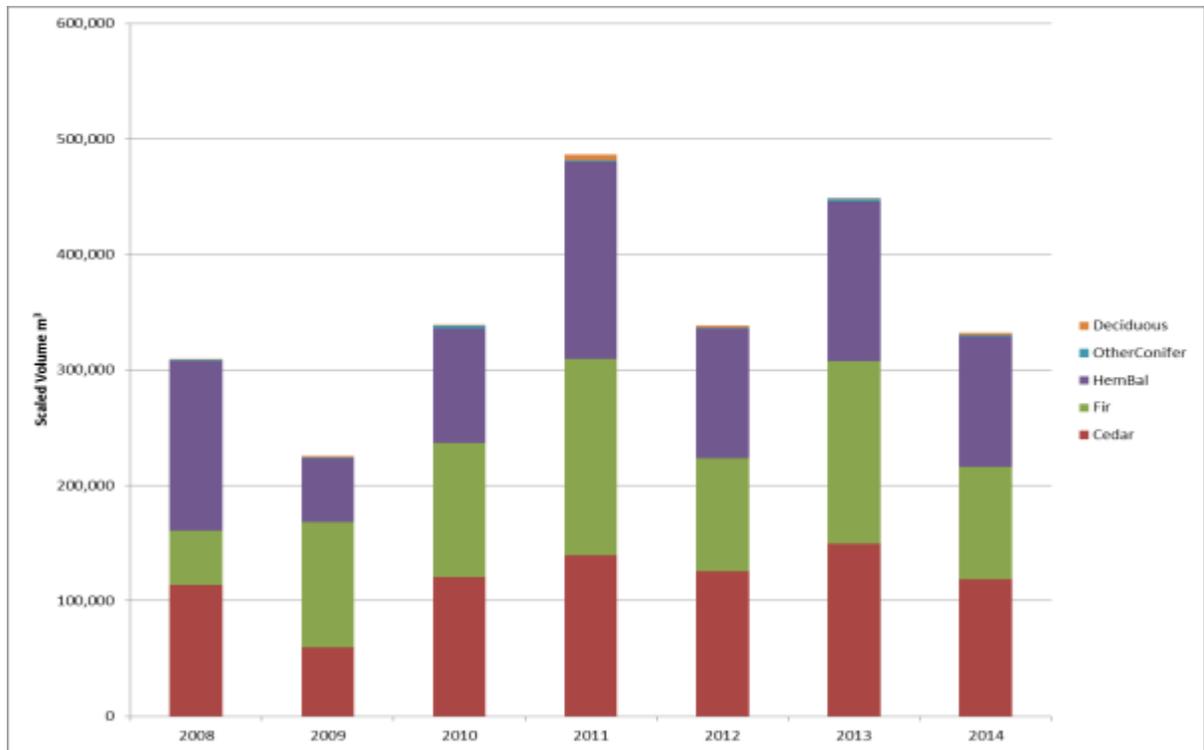


Figure 10: Harvest by species groups, Arrowsmith TSA 2008 to 2014

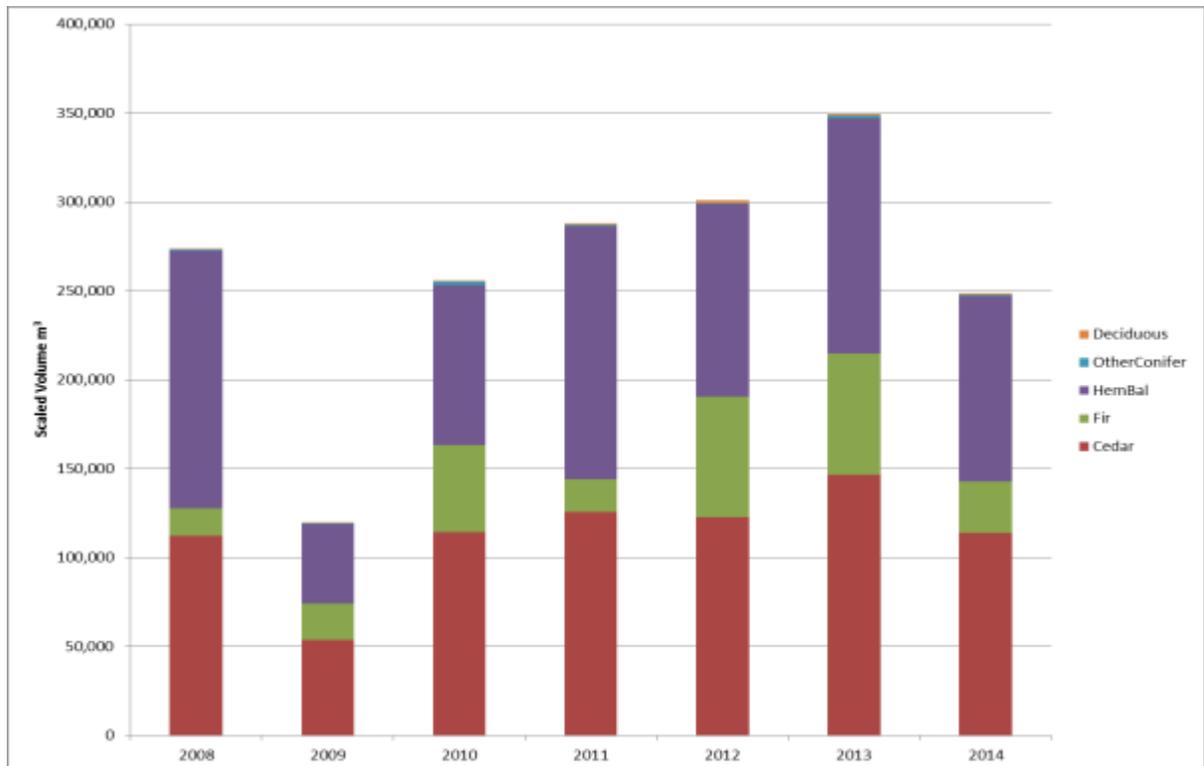
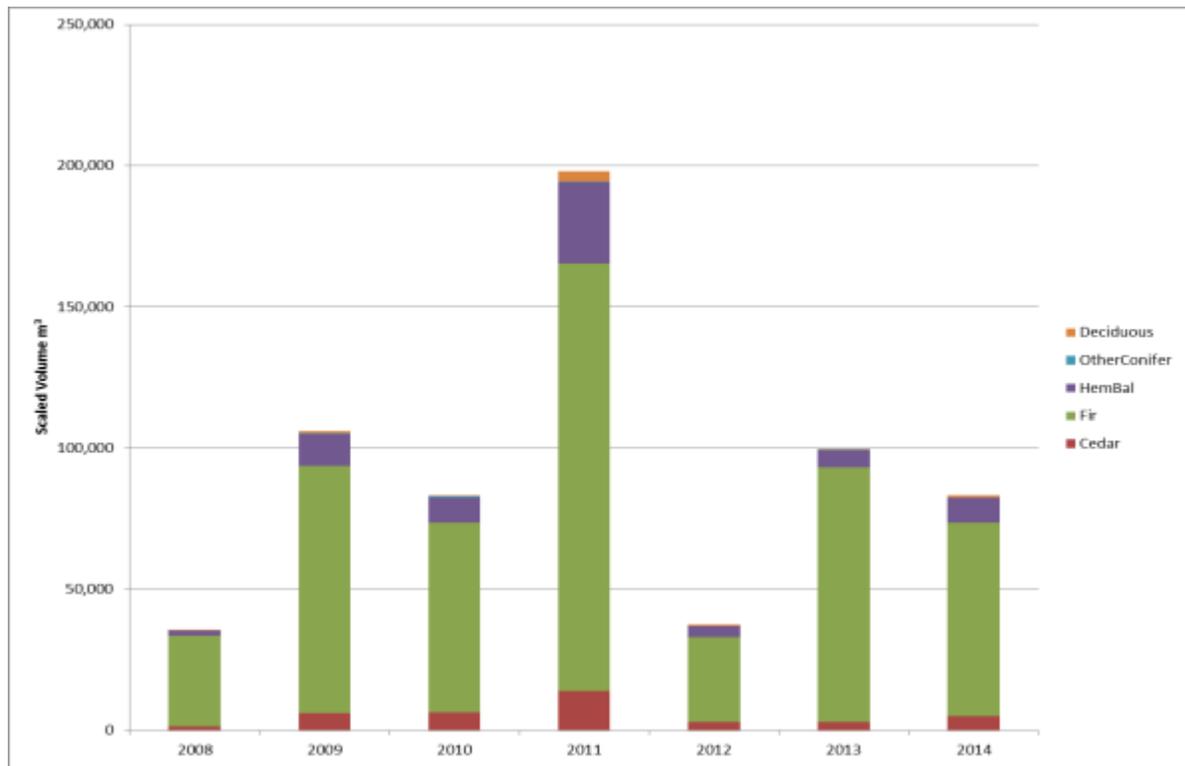


Figure 11: Harvest by species groups, west zone 2008 to 2014



**Figure 12: Harvest by species groups, east zone 2008 to 2014**

The harvest in the west zone has been predominantly old growth i.e. stands older than 140 years of age (Figure 13). Between years 2008 and 2014, 74% of the harvest was from old growth stands, on average. While the harvest billing data does not allow for a more refined examination regarding the age classes of the stands harvested, an analysis of the opening data indicates that some younger – age class 3 and 4 - second growth stands are also harvested in the west.

As discussed above, the harvest in the east zone has been almost entirely Douglas fir. It is mostly second growth as illustrated in Figure 15. The harvest opening data (Figure 16) also shows that in some recent years such as 2011 and 2013 more than 50% of the Douglas fir harvest openings were age class 3 stands (41 to 60 years old).

Past TSRs traditionally assumed that older, natural forests are harvested first. The harvest of managed stands was not generally expected until later in the planning horizon. The 2008 Arrowsmith TSA TSR forecasted that the timber supply in the TSA would come entirely from existing natural stands until 2028. This is not the case as more harvesting now occurs in managed second growth stands. The transition to harvesting managed stands earlier and harvesting them at young ages will likely have an impact on the future quantity and quality of the timber supply. The potential impact will be analyzed in this plan through scenario analysis.

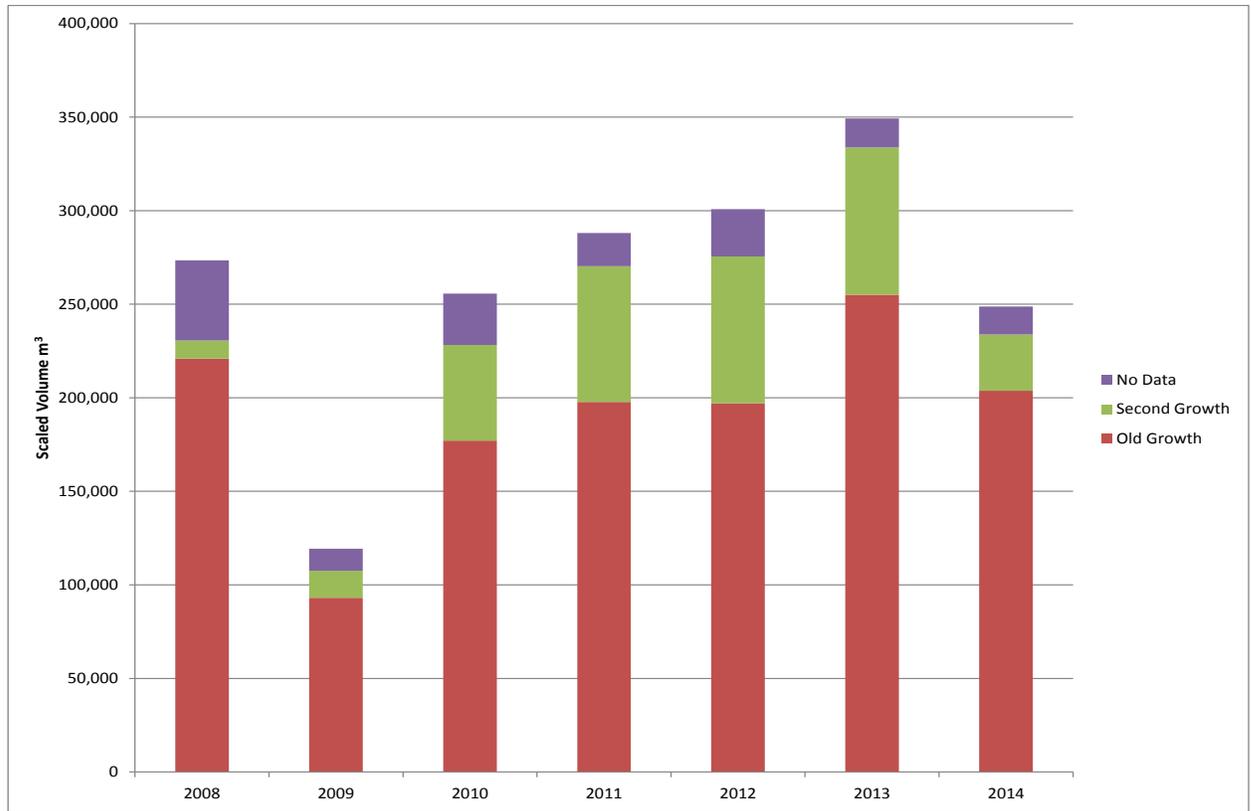


Figure 13: Old growth harvest vs. second growth harvest, west zone

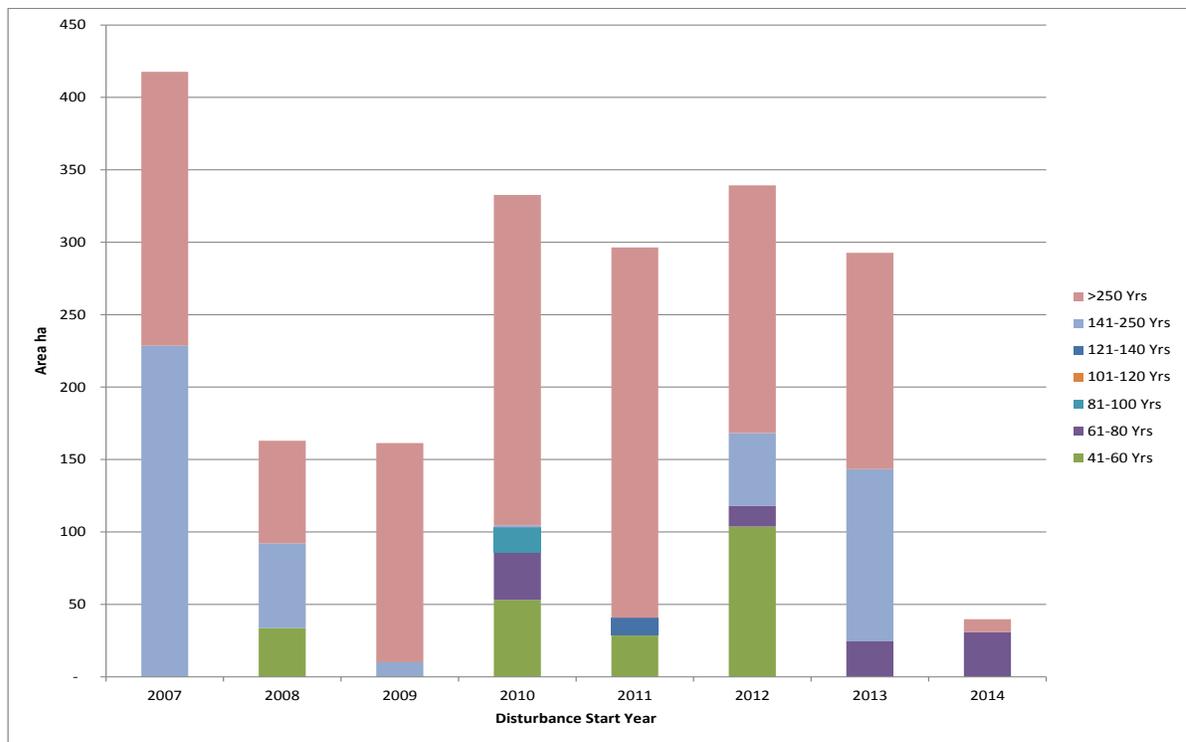


Figure 14: Previous stand leading species and age class, west zone

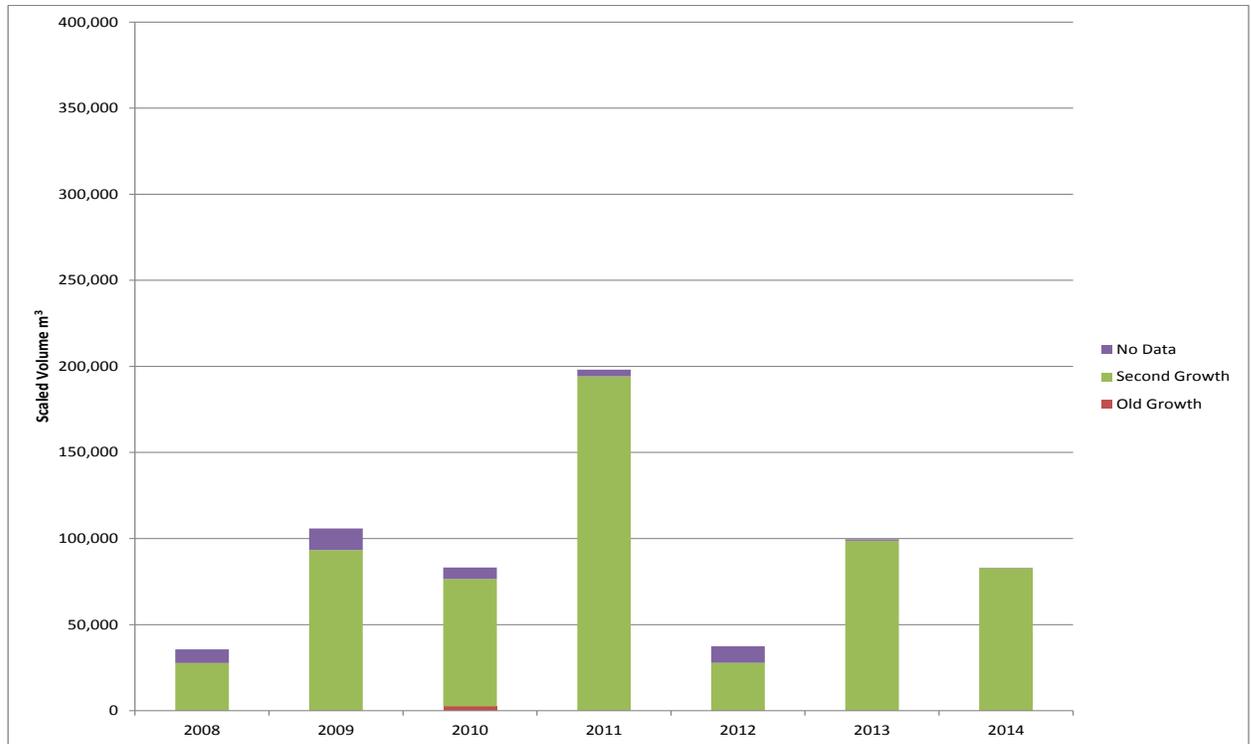


Figure 15: Old growth harvest vs. second growth harvest, east zone

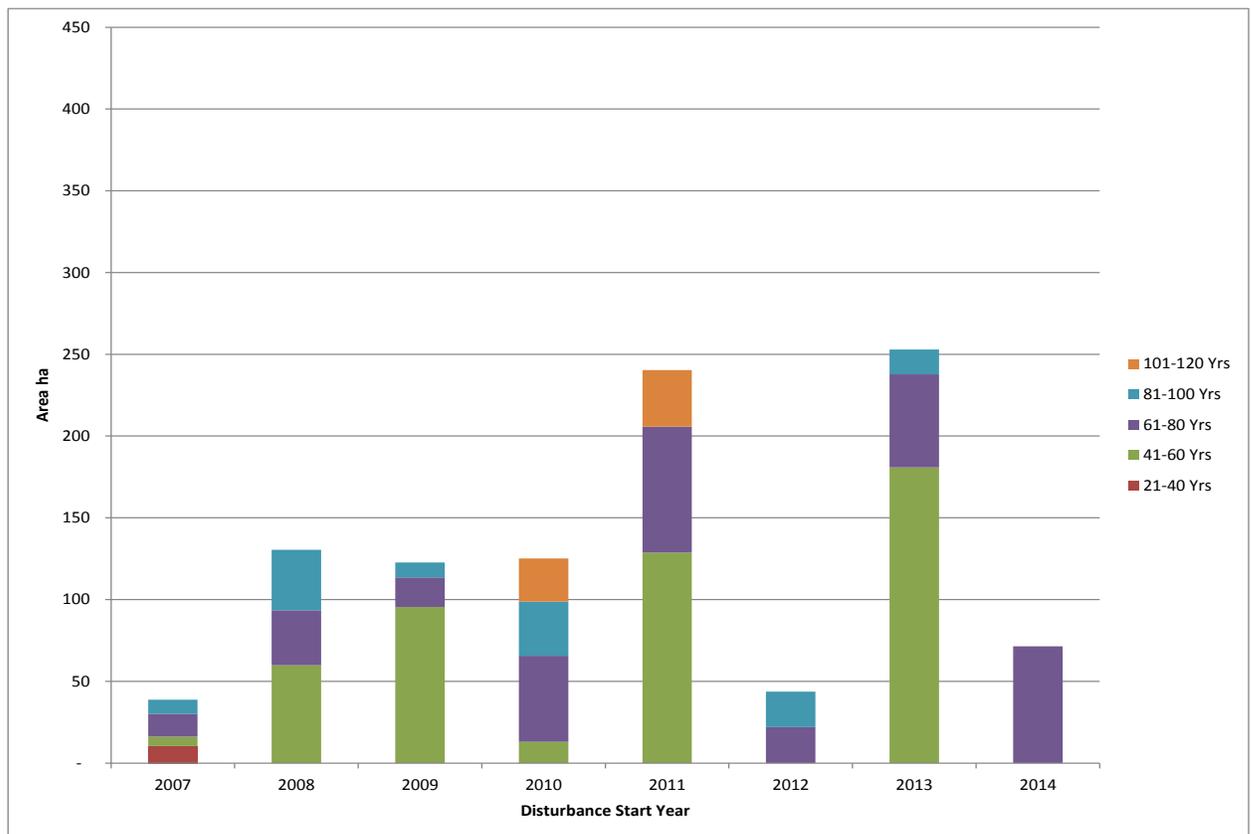


Figure 16: Previous stand leading species and age class, east zone

## **4.5 Timber Supply Review Initiated in 2014**

By legislation the deadline for the next AAC determination for the Arrowsmith TSA is July 2019; 10 years after the last determination. A new TSR was initiated by the FLNRO in 2014 to address concerns regarding the timber supply in the Arrowsmith TSA. The following factors contributed to the early commencement of the TSR:

- ❖ Economic operability: FLNRO staff and the TSA licensees regarded the economically operable land base as modeled in the last TSR to be an overestimation. An economic operability project was completed in the spring of 2014. The project redefined the economically operable land base for the on-going TSR;
- ❖ Fragmented and constrained land base with new and proposed area-based licenses: the TSA is heavily fragmented and constrained. New and proposed area-based tenures fragment the land base even more and make it difficult for the TSA licensees and BCTS to find operating area;
- ❖ First Nations treaties and Interim Treaty Agreements are withdrawing land from the TSA and are contributing to the difficulty in finding operating areas.

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## ***5 Additional Forest Management Challenges***

### **5.1 Forest Inventory**

The current forest inventory is old and is not considered reliable. The Arrowsmith TSA was last inventoried in 1988 – 1989. Since then the inventory information has been updated for disturbance and forest cover attributes have been projected to 2014 for use in the on-going TSR. The forest cover inventory for the TSA has been converted from the FC1 to the VRI data structure. A new vegetation resource inventory (VRI) is being developed for the TSA; however, the new inventory is not available for the on-going TSR or the IRMP.

### **5.2 First Nations**

Thirty-six First Nations and three treaty organizations have asserted traditional territories within the Arrowsmith TSA. As mentioned above, land withdrawals for treaties and interim treaty agreements have reduced the THLB in the TSA. It is expected that future agreements will continue this trend.

Many areas of special importance to local First Nations are currently not included in harvest plans, which further constrains harvest opportunities and concentrates the harvest in other areas. Maintaining a supply of western redcedar for traditional use is of high importance and there are also expectations that in the future, harvest flow controls will be put in place to ensure sustainable harvest levels within traditional territories.

### **5.3 Accessibility of Timber**

The fragmented and constrained nature of the TSA makes it difficult to spatially locate the economic harvest that is determined to be available through the Chief Forester's AAC determination. Several examples exist where the harvest of isolated, often old growth, low-margin

timber is feasible only if the harvest can be combined with the harvest of a substantial volume of second-growth timber, often not available until two to three decades into the future.

In some areas, the green-up of adjacent cut blocks is constraining operationally available timber supply.

#### **5.4 Private Managed Forest Lands**

The Arrowsmith TSA parcels are adjacent to many privately managed forest lands. These private lands are not subject to similar management constraints as the lands that form the TSA. At times, the management of the private forest lands creates additional pressures on the TSA. According to District staff there is an expectation by the public for the TSA management to compensate for what may be considered timber-focused management by the private land owners.

#### **5.5 Basic Silviculture**

The success of basic silviculture is crucial to future timber supply. Basic silviculture is also the basis for future incremental treatments. The following questions have been discussed throughout British Columbia in the silviculture strategy workshops:

- ❖ Are the initial stocking densities sufficient to ensure the production of a reasonable volume of timber on a given site?
- ❖ Are the initial densities sufficient to provide the quality of timber for future markets?
- ❖ Are the initial densities sufficient to buffer against future abiotic and biotic damaging agents?
- ❖ Should there be more of a mix of species, where ecologically feasible, to buffer against future abiotic and biotic damaging agents? This question applies to both block and landscape levels.
- ❖ What is the potential impact of climate change on species choices; should some species be demoted or promoted?

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### ***6 Timber Quantity***

This IRMP will investigate options to increase and/or maintain timber supply using incremental silviculture. It will contain stakeholder determined targets and strategies for timber quantity and form an effective vehicle to plan the use of public funds for new and existing initiatives.

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### ***7 Timber Quality***

The current provincial target for premium logs is 10% of the AAC for each TSA. In the past, a premium log was frequently defined by such characteristics as: species, taper (lack of), tightness of grain, clear wood and size, often diameter. Today many of the above-listed traits still signify quality; however, size tends to be less important. Also, different forestry companies may value different quality aspects in their operations.

The 2001 Type 2 silviculture analysis demonstrated that the harvest volume of larger steams (65+ cm) can be doubled by increasing the rotation ages past the mai culmination age. The strategy also illustrated that an extensive pruning program can increase the long-term harvest of solid, clear wood from zero to 9% of the total harvest.

This IRMP will contain stakeholder determined definitions for timber quality. It may also recommend strategies to maintain or enhance the quality of current and future managed stands.

This project will also attempt to assess managed stand values resulting from different regeneration and treatment regimes. These will include estimations of future stand value using varying establishment densities and species compositions. The value estimations will use industrial and government log grades and prices and milling studies, where available.

## **8 Biodiversity and Habitat**

FRPA provides the framework for the management of biodiversity and habitat; however, other legal direction may expand or replace FRPA direction.

The VILUP recognizes enhanced forestry zones (EFZ), special management zones (SMZ) and resource management zones (RMZ) with specific biodiversity and habitat objectives. The approved wildlife habitat areas (WHA) have additional objectives and management requirements.

### **8.1 Retention Strategies**

The VILUP sets retention targets for different land use zones, with the Clayoquot Sound Plan Area having its own targets. Almost 60 % of the harvest in the Arrowsmith TSA includes variable levels of retention with the rest consisting of clear cut with reserves and clear cut (MOFR, 2009).

### **8.2 Wildlife Habitat**

#### **8.2.1 Wildlife Habitat Areas and Species at Risk**

Wildlife Habitat Areas (WHA) manage habitat for regionally important wildlife and species at risk (SAR). The Wildlife Habitat Area (WHA) designation falls under FRPA and provides one of many legal means to manage wildlife in BC. Implementation of WHAs is guided by policy and procedures established through the Government Actions Regulation (GAR) Policy and Procedures (2013) and Identified Wildlife Management Strategy (IWMS) established in 1999 and amended in 2004.

An implementation plan and related socioeconomic analysis form an important part of the WHA establishment process. Its intent is to ensure that the socio-economic impacts resulting from establishing a WHA do not exceed guidance provided by provincial policy.

In general, WHAs are expected to have a maximum of 1% timber supply impact. For some Species at Risk, such as Marbled Murrelet and Northern Goshawk, the provincial government has waived this requirement pending related land use decisions. Additional WHA designations are expected. This IRMP will provide an opportunity to facilitate a better coordination of the establishment of WHAs by considering the following:

- ❖ Are the reserves with pending implementation plans placed where they provide the conditions most needed by species at risk?
- ❖ Are there options to co-locate reserves to maximize the benefits of the hectares reserved ecologically, while preserving or increasing harvest opportunities?

There are over 50 Species at Risk in the Arrowsmith TSA. The species that are currently managed through WHAs are:

- ❖ Northern Goshawk;
- ❖ Douglas fir/Garry oak-onion grass;
- ❖ Marbled Murrelet;
- ❖ Red-legged frog.

### 8.2.2 Ungulate Winter Range

GAR Order u-1-017 established winter ranges for mule deer and Roosevelt elk in the Arrowsmith TSA in 2003. The Order was amended in 2010 to account for boundary changes to some of the winter range units. This order includes GWMs that prohibit or constrain harvest within in each UWR unit.

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## ***9 Stakeholder Meetings (Workshops)***

Several stakeholder meetings will occur throughout the planning process. The meetings at the beginning of the IRMP process will focus on reviewing TSA issues, defining the values, indicators and targets for the plan, while the later meetings will provide an opportunity for the participants to view and comment on analysis results and help formulate the actual plan.

### **9.1 Review Data and Issues**

At the first stakeholder meeting the basic data will be reviewed and key issues around timber supply, timber quality, and habitat supply (non-timber issues) will be clarified.

### **9.2 Strategic Plan Matrix**

Our plan is to build a strategic plan matrix that identifies all the existing plans and strategies within the TSA. The matrix includes the plan/strategy, its vintage and related references to existing data. As some plans and strategies may not pertain to the TSA as a whole, but only parts of it, the sub-units (areas) for each plan are identified. The matrix will be forwarded to the stakeholders and reviewed at the first stakeholder meeting.

The pertinent questions regarding the existing plans and strategies may be:

- ❖ Is the strategy/plan still relevant and feasible? An AAC that is based on harvesting supply blocks with no harvest performance may not be feasible;
- ❖ Is the strategy working? Is a partition of the AAC in a TSA accomplishing the goals and objectives?
- ❖ Does a strategy/plan need revising? Does a given strategy/plan work with the carbon economy and changes in climate?
- ❖ Does a strategy/plan work with other resource industries expanding their activities in the management unit?

## 9.3 Vision for the Future Forest

### 9.3.1 Values

The stakeholders are expected to participate in forming the vision of the future forest in the Arrowsmith TSA. This will start by the definition of values that will be considered in the IRMP. The scope of this pilot project will consider FRPA values as a starting point. Other values may be included during the planning process, as required.

The values relate to the plan matrix discussed above. The strategic plans that exist in the TSA have goals and objectives that are designed to protect and/or enhance the FRPA values.

### 9.3.2 Objectives, Indicators, Targets and Propose Strategies

There are objectives that are tied to the identified values. Each objective will have an indicator and a strategy or “how-to” part, i.e. how the objective will be met. Finally, a target would be included to facilitate quantitative or qualitative measurement for the objective. The target would also facilitate planning, implementation and funding, and provide a monitoring point. The following example illustrates this approach:

Value	Harvestable Timber
Objective	Mid-term timber supply fall-down mitigation
Indicator	Volume of timber
Strategy	Fertilization (specifics for species, ages, locations)
Target	Expected increased timber supply compared to “status quo” or no mitigation strategy

Building a matrix of values, objectives, indicators, proposed strategies and targets facilitates review and discussion by providing a picture of the complete vision for the future forest.

The documented objectives in the matrix are then ranked and management options are developed that reflects this ranking. The ranking would reflect the participants’ willingness to forego or delay the meeting of the lower ranked objectives.

## 9.4 Stakeholder Meeting Outcome

The anticipated outcomes of the first stakeholder meeting(s) are:

- ❖ Commentary on the existing plans and strategies;
- ❖ TSA values and critical issues regarding those values. Values objectives identified for the TSA; these will be modeled and/or tracked in the analysis;
- ❖ Define indicators to be used to evaluate the status of values and the results of the forest level modeling;
- ❖ Define working targets for TSA value indicators; likely for timber supply, timber quality, habitat supply and other non-timber values;
- ❖ Rank objectives;
- ❖ Define possible management strategies to meet objectives and working targets;

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