



**Quesnel Timber Supply Area  
Forest Landscape Plan  
Summary of Current Forest Management**

April 11, 2023

## 1 Acknowledgment

The Planning Team wish to acknowledge the many Indigenous Peoples, licensees, the city of Quesnel, and the various stakeholders and technical experts that have been part of the journey so far providing. Their knowledge and expertise have been essential to the process.

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## 4 List of Acronyms

<b>Acronym</b>	<b>Definition</b>
<b>AAC</b>	Annual Allowable Cut
<b>BCWS</b>	BC Wildfire Service
<b>BCTS</b>	BC Timber Sales
<b>BEC</b>	Biogeoclimatic Ecosystem Classification
<b>SCFM</b>	Summary of Current Forest Management
<b>CCLU</b>	Cariboo-Chilcotin Landscape Units
<b>CCLUP</b>	Cariboo- Chilcotin Land Use Plan
<b>CEF</b>	Cumulative Effects Framework
<b>CFLB</b>	Crown Forest Land Base
<b>CHA</b>	Cultural Heritage Act
<b>CHR</b>	Cultural Heritage Resource
<b>DBH</b>	Diameter at Breast Height
<b>ESA</b>	Environmentally Sensitive Area
<b>FCRSA</b>	Forest Consultation and Revenue Sharing Agreement
<b>FLP</b>	Forest Landscape Plan
<b>FOR</b>	Ministry of Forests
<b>FPPR</b>	Forest Planning and Practices Regulation
<b>FRPA</b>	Forest and Range Practices Act
<b>FSP</b>	Forest Stewardship Plan
<b>G2G</b>	Government to Government
<b>GAR</b>	Government Action Regulation
<b>GHG</b>	Green House Gas
<b>GIS</b>	Geographic Information System
<b>IAPP</b>	Invasive Alien Plant Program
<b>LAO</b>	Land Act Order
<b>LU</b>	Landscape Unit
<b>LUP</b>	Landscape Unit Plan
<b>LMS</b>	Land Management Strategy
<b>MPB</b>	Mountain Pine Beetle
<b>NAR</b>	Net Area to be Reforested
<b>NDT</b>	Natural Disturbance Type
<b>FRFL</b>	Non-Replaceable License
<b>OGMA</b>	Old Growth Management Area

<b>PFA</b>	Primary Forest Activity. Includes road building, harvesting and silviculture activities.
<b>RESULTS</b>	Reporting Silviculture Updates and Land status Tracking System
<b>RFL</b>	Replaceable Forest License
<b>RMA</b>	Riparian Management Area
<b>RMZ</b>	Riparian Management Zone
<b>RRZ</b>	Riparian Reserve Zone
<b>TFL</b>	Tree Farm License
<b>THLB</b>	Timber Harvesting Land Base
<b>TSA</b>	Timber Supply Area
<b>TSR</b>	Timber Supply Review
<b>UNDRIP</b>	United Nations Declaration on the Rights of Indigenous Peoples
<b>UWR</b>	Ungulate Winter Range
<b>VOIT</b>	Values, Objectives, Indicators and Targets
<b>VQO</b>	Visual Quality Objective
<b>WHA</b>	Wildlife Habitat Area
<b>WTR</b>	Wildlife Tree Retention

## 5 Introduction

The Quesnel Forest Landscape Plan (FLP) Summary of Current Forest Management (SCFM) describes the current forest management practices, and current conditions, within the planning area for the Quesnel FLP. The SCFM is an integral part of the FLP development process, as it informs the current practices and identifies knowledge gaps in forest management. The SCFM is based on current databases, inventories and information from the BC government, Indigenous nations, licensees, and stakeholders.

An FLP is an emerging forest management tool in British Columbia that is intended to replace the current Forest Stewardship Plans (FSP) as part of changes to provincial forest management planning. Forest landscape planning is the process of establishing clear objectives and outcomes for the management of forest resource values over a defined area. The new forest landscape planning will enable a consolidated approach to forest planning, and management, at the landscape level (e.g., timber supply area, tree farm licence, or large area-based forest tenure). It will also help to facilitate upfront collaboration between government, Indigenous Nations, and licensees, with input from stakeholders, communities, and the public.

The Quesnel FLP process will consider higher-level strategic planning direction, such as the existing Cariboo-Chilcotin Land Use Plan (CCLUP), and will address the following objectives:

1. Support the production and supply of timber in the forest landscape area.
2. Support the protection and conservation of the environment.
3. Manage the values placed on forest ecosystems by Indigenous peoples.
4. Manage the values placed on forest ecosystems by local communities; and
5. Prevent, mitigate, and adapt to impacts caused by significant disturbances to forests and forest health, including wildfire, insects, disease, and drought.

The Quesnel FLP will help to align forest management direction from the CCLUP to the conditions, and associated emerging issues, specific to the plan area. The FLP may also include recommended planning guidelines to achieve outcomes associated with each of the plan's objectives. The Quesnel FLP is intended to be iterative with a term of approximately 10 years. The outcomes within the FLP are required to be reported on every five years. If it is found that certain outcomes are not being met, the FLP can be adjusted, and update. A monitoring plan will be developed in conjunction with the FLP.

The development of the Quesnel FLP includes an analysis of the current condition for the plan area. The results of this assessment will be used to build a vision for the desired future landscape conditions and this vision will drive the development of management regimes across the planning area.

The information described in this report will support the development of the upcoming situation analysis for the Quesnel FLP.

## 6 Planning

The Quesnel FLP is being developed collaboratively with Indigenous Nations, forest licensees, resource stakeholders, and the public. This Planning Table, which consists of Indigenous Nations, Provincial government and forest licensees is overseeing the development of the Quesnel FLP and intends to provide forest sector specific direction on where and how forest management activities occur at an operational level within the broad zones established by the CCLUP. This operational approach is consistent with strategic land use plan direction and other legal land use orders; however, given the potential outdated or no longer appropriately based direction in CCLUP arising from significant land base changes (i.e. wildfire, changing expectations around wildfire risk reduction), the Planning Table will identify and seek opportunities where some of the strategic and/or immediate issues could be addressed through the FLP process.

### 6.1 Overview of the Planning Area

The overall planning area for generally corresponds to the boundary of the Quesnel timber supply area (TSA), including portions of the Cascadia TSA that are fully the outer boundary of the Quesnel TSA, and covers 2 079 407 hectares of land. Private lands, Indian Reserves, woodlots, Tree Farm Licence 52 (TFL52), and the Wells-Barkerville Community Forest are not part of the planning area for the Quesnel FLP planning area. The Quesnel FLP planning area is 1 665 770 hectares.

The Quesnel TSA is in the central interior plateau of British Columbia between Bowron Lake Provincial Park in the northeast and Itcha Ilgachuz Provincial Park in the southwest. The TSA is bisected by the Fraser River and includes numerous river systems, such as the Blackwater and the Nazko.

The TSA has a wide diversity of climate, terrain, and forests. In the western portion of the TSA, the climate is relatively dry and cold, the terrain is relatively flat, and the forests are dominated by pine. Towards the eastern portion of the TSA, the climate becomes wetter and stands of spruce, and balsam, are much more frequent.

Located at the confluence of the Quesnel and Fraser Rivers, the City of Quesnel is home to approximately 10,000 residents. An additional 9,000 residents live within the boundaries of the TSA (2016 and 2021 census). While the economy of the TSA is relatively diversified, the trades,

manufacturing, and natural sectors collectively, employ about 37 percent of the labour force. These sectors include most of the occupations related to forestry, such as sawmill workers or truck drivers.



Figure 1: Quesnel Timber Supply Area located in the central interior of B.C.

The importance of forestry to the local economy is reflected by the large number of timber processing facilities located within the Quesnel TSA. There are currently four sawmills, two pulp and paper mills, and three facilities producing plywood, veneer, or paneling. Wood for these facilities is harvested under a variety of forest tenures and agreements, including forest licences, community forest agreements, or tree farm licence (Figure 2).

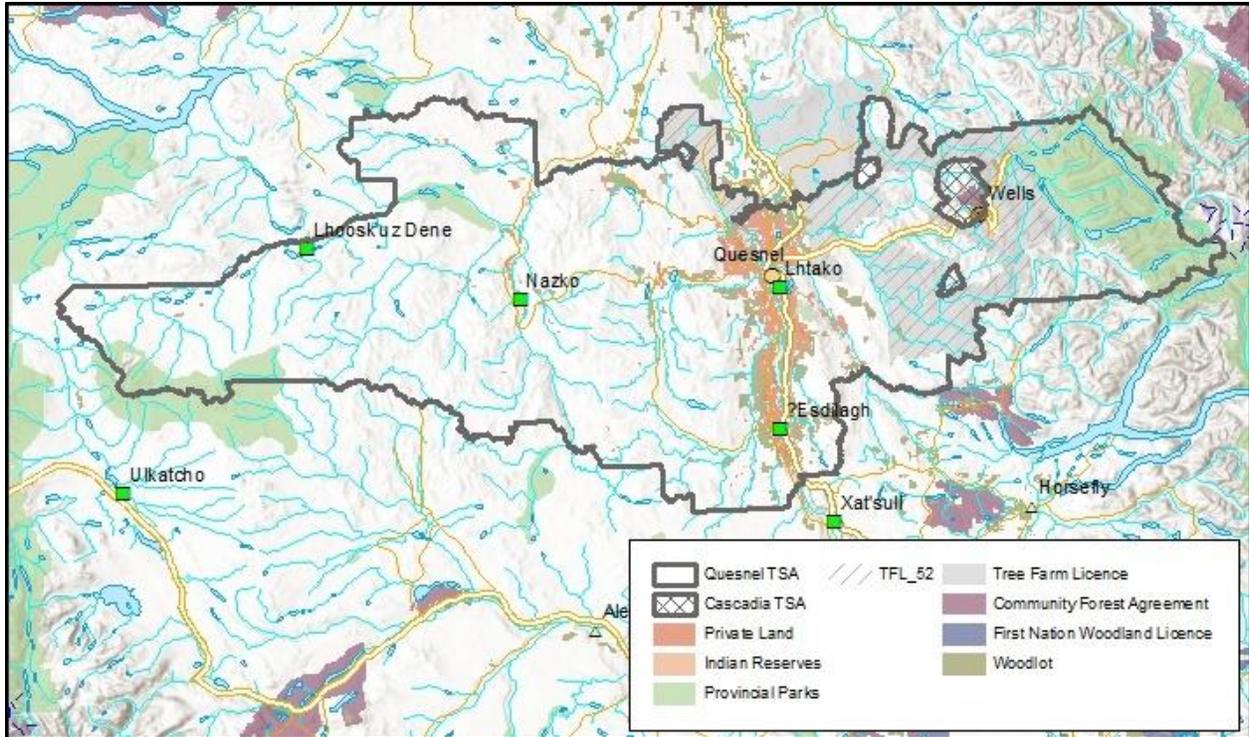


Figure 2: An overview map of the Quesnel TSA and specific land designations.

## 6.2 Indigenous Nations

The following First Nation communities have identified traditional territories within the Quesnel TSA:

- ?Esdilagh First Nation
- Lheidli T'enneh First Nations
- Lhoosk'uz Dene Nation
- Lhtako Dene Nation
- Nazko First Nation
- Neskonlith Indian Band
- Saik'uz First Nation
- Skin Tyee First Nation
- T'exelc (Williams Lake First Nation)
- Tl'etinqox (Anaham)
- Tsi Del Del
- Ulkatcho First Nation
- Xats'ull First Nation

Nazko First Nation, Lhoosk'uz Dene Nation, Lhtako Dene Nation, Ulkatcho First Nation, ?Esdilagh First Nation and Xats'ull First Nation are actively engaged in building the FLP and participating in different capacities.

## 6.3 Key Direction for Forest Values and Conditions

There are many legal and non-legal objectives that provide direction to current practices taking place within the QFLP area. The following section provides the legal hierarchy of objectives that FSP holders must follow when managing for identified forest values. Current results and strategies within FSPs are written in such a way as to demonstrate how they are achieving the specific objectives and are referenced within the appropriate values in Section 16.

### 6.3.1 Land Use Plan - Cariboo-Chilcotin Land Use Plan

The Cariboo-Chilcotin Land Use Plan (CCLUP), announced by the B.C. government in 1994, guided the creation of new parks and protected areas. The CCLUP also established resource management objectives, targets, and strategies.

The CCLUP, along with the CCLUP 90-day report, and the accompanying land use objectives, provide legal direction and guidance regarding forest management within the Quesnel TSA.

#### 6.3.1.1 CCLUP 90 Day Report

On October 24, 1994, the British Columbia Government announced the Cariboo-Chilcotin Land Use Plan. At that time, a ninety-day plan process was initiated to develop technical details for the implementation of the Plan. This document reports on the implementation process for the Cariboo-Chilcotin Land Use Plan and translates the general content into more explicit implementation details and provides direction for resolution of several significant issues.

#### 6.3.1.2 Quesnel Sustainable Resource Management Plan

The Quesnel sustainable resource management plan (SRMP) addresses CCLUP strategies and targets on an area specific basis. This is done through detailed objectives and strategies for the management of natural resources and the maintenance of environmental values. It is non-legal guidance, however, many of the strategies and targets from the SRMP were incorporated into the land act order that provide legal direction to current forest management.

#### 6.3.1.3 Land Use Objectives for the CCLUP area

In 2010, a Land Use Objective Order (LAO) established legal direction for forestry activities in respect to key resource values. The order contains objectives and maps for biodiversity, wildlife trees, old growth forest, critical habitat for fish, community areas of special concern, lakes, riparian areas, mature birch retention, grasslands, scenic areas, recreation trails, high value wetlands for moose, and grizzly bear.

Several specific outcomes and current management strategies are outlined in the LAOs and are referenced within FSPs.

### 6.3.2 Forest and Range Practices Act

The Forest and Range Practices Act (FRPA) governs forest, and range, activities on public lands in B.C. related to forest planning, road building, timber harvesting, reforestation, and livestock grazing.

FRPA applies to all public forest lands and to anyone who holds an agreement under the Forest Act or Range Act. It also applies to private land associated with woodlot licences and tree farm licences.

### 6.3.2.1 Forest Planning and Practices Regulation

The Forest Planning and Practices Regulation (FPPR) outlines the practice requirements associated with forest management activities. Licensees may vary some of these requirements within their FSPs, or through government-approved conditional exemptions.

### 6.3.2.2 Government Action Regulation

Under FRPA, the Government Actions Regulation (GAR) directs how the B.C. provincial government establishes land designations, or stewardship measure, for forest and range values. GAR orders have also created wildlife habitat areas (WHA) for specific species. The Quesnel TSA currently has five GAR orders. These GAR Order are for: American White Pelican, Mountain Caribou (Eastern Herd) and Mountain Caribou (Western Herd), Blue Heron, and Mule Deer.

## 7 Parks, Ecological Reserves, and Protected Areas

Parks, ecological reserves, and other protected areas (e.g., recreation areas, conservancies) are designated to protect important natural and cultural components of the province.

Development in Class A and Class C provincial parks is limited to activities that are only necessary to maintain recreation values. Class C Park, such as Wendle Park, are managed by a local board. Ecological reserves are highly protected and are not established for outdoor recreation. There are no protected recreation areas, and no conservancies area, within the planning area. The parks and ecological reserves present within the planning area can be found in Table 1 and Figure 3.

Table 1: Parks and ecological reserves that are present within the planning area.

Name	Class	Establishment Date	Total Official Area (ha)	Area Within FLP Planning Area (ha)
<b>Provincial Parks</b>				
Bowron Lake Park	Class A	1961-06-06	139,700	114,001
Caribou Mountains Park	Class A	1995-07-12	113,470	29,393
Caribou River Park	Class A	1995-07-12	3,211	1,267
Dragon Mountain Park	Class A	2013-03-06	1,773	1,773
Finger-Tatuk Park	Class A	1999-06-29	17,127	13
Itcha Ilgachuz Park	Class A	1995-07-12	109,063	38,259
Kluskoil Lake Park	Class A	1995-07-12	15,548	15,362
Pinnacles Park	Class A	1969-09-18	124	124
Puntchesakut Lake Park	Class A	1980-06-26	38	37
Ten Mile Lake Park	Class A	1962-02-05	343	343
Titetown Park	Class A	2013-03-06	1,070	1,070
Wendle Park	Class C	1941-04-17	259	270
<b>Ecological Reserves</b>				
Mount Tinsdale Ecological Reserve		1975-12-04	438	438
Ilgachuz Range Ecological Reserve		1975-06-12	2746	2215
Narcosli Lake Ecological Reserve		1973-10-09	1098	1090
			<b>Total</b>	<b>205,593</b>

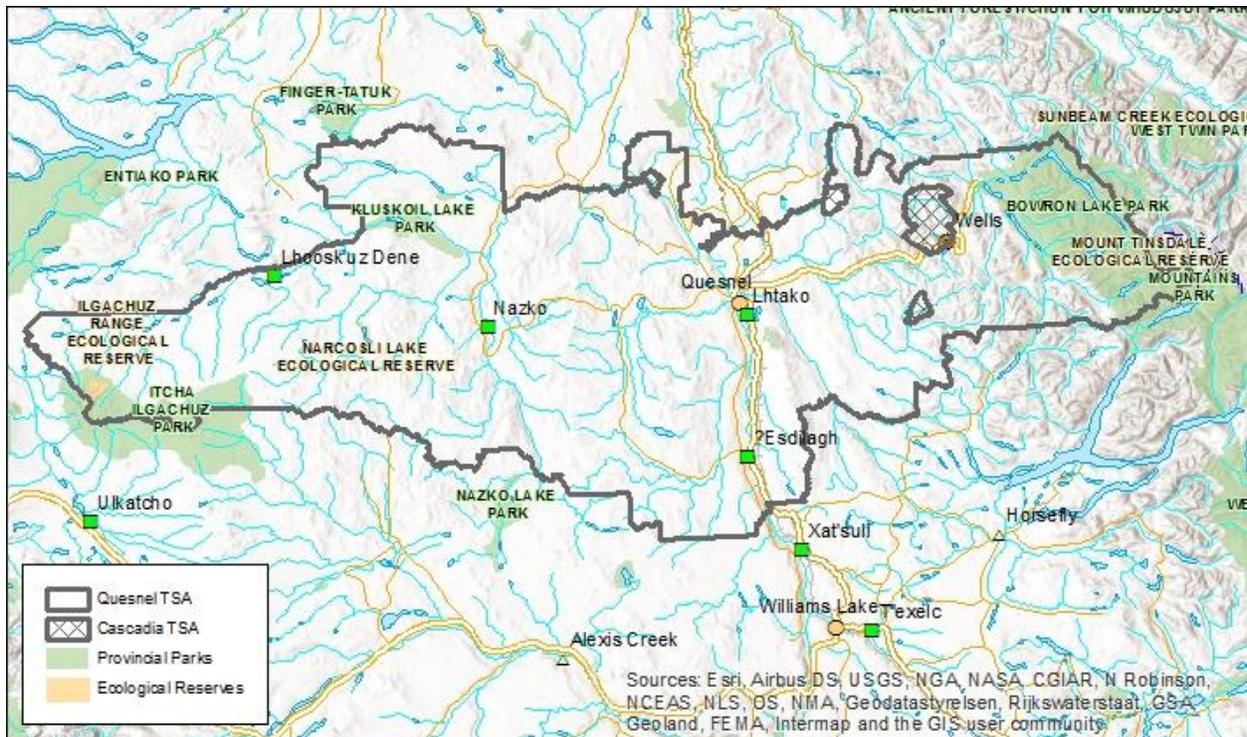


Figure 3: Parks and ecological reserves found in the QFLP planning area.

## 8 Biogeoclimatic Zones<sup>1</sup> and Natural Disturbance Types<sup>2</sup>

The biogeoclimatic ecosystem classification (BGC) classifies ecosystems based on climate, vegetation, and geographic location. Within the Quesnel TSA, the dominant BGC zones are the Sub-boreal Spruce (SBS), the Sub-boreal Pine – Spruce (SBPS), the Engelmann Spruce – Subalpine Fir (ESSF), and the Montane Spruce (MS) zones. Other zones include the Interior Cedar – Hemlock (ICH) and Interior Douglas-fir (IDF) zones. Figure 4 shows the diverse ecosystems of the Quesnel TSA.

The SBS zone is characterized by seasonal extremes of temperatures ranging from severe, snowy winters to relatively warm and short summers. This zone is dominated by coniferous forests where hybrid white spruce and subalpine fir represent the dominant climax tree species. Lodgepole pine is common in mature forests in the drier parts of the zone with both lodgepole, and trembling aspen, extensively populating stands following a disturbance. Paper birch and Douglas-fir are also found in this zone.

Compared to the SBS, the SBSP is drier, with a cool, dry, growing season. This is the result of being in the rain shadow of the Coast Mountains. This zone is relatively high in elevation and lodgepole pine is the most common tree species.

In the ESSF, the growing season is cool and short, and the winters are long and cold. At lower elevations, the forest is continuous while in the upper elevations, clumps of trees occur together with areas of heath, meadow, and grassland. Engelmann spruce and subalpine fir are the dominant species.

<sup>1</sup>1991, [Ecosystems of British Columbia - Special Report Series 06 \(gov.bc.ca\)](http://gov.bc.ca)

<sup>2</sup> [Biodiversity Guidebook \(Forest Practices Code of British Columbia, September 1995\) \(gov.bc.ca\)](http://gov.bc.ca)

The MS has cold winters and moderately short and warm summers. Young and maturing stands of lodgepole pine, that have developed following wildfire, are found extensively in this zone. In wetter areas within the MS, mixed stands of lodgepole pine, hybrid white spruce and subalpine fir are present.

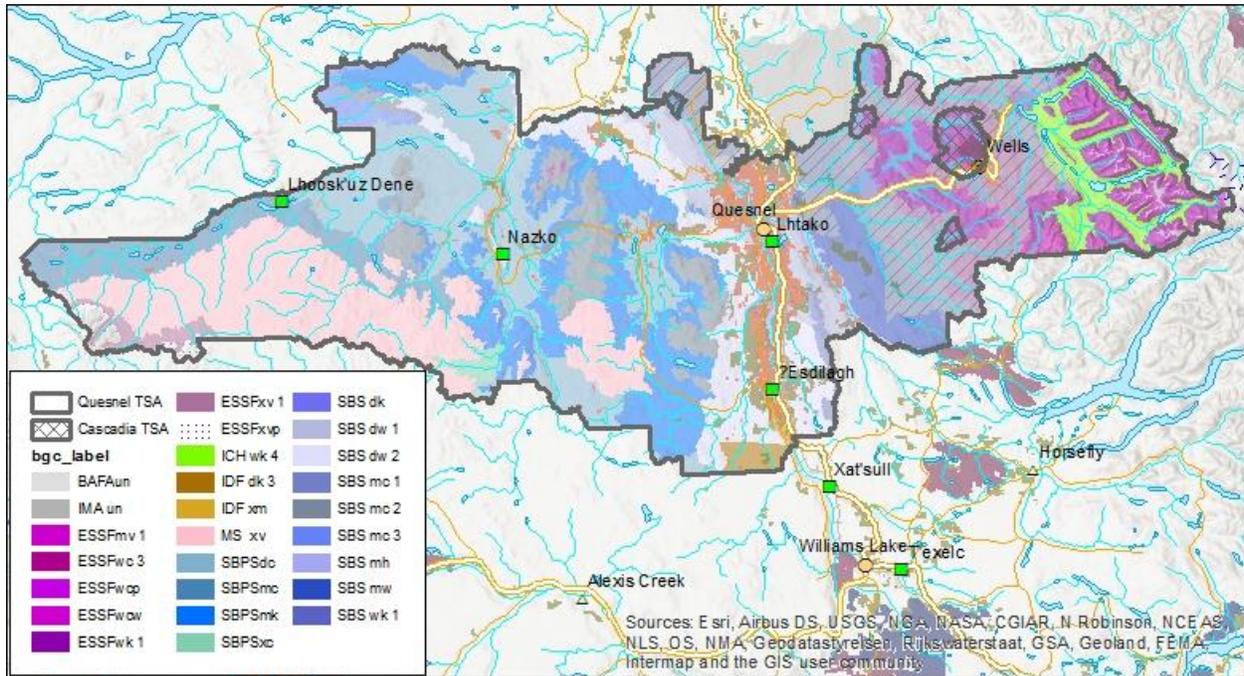


Figure 4: Biogeoclimatic zones and subzones found in the QFLP planning area.

The area occupied by each BGC zone, subzone, and variant combination within the Quesnel TSA can be found in Table 2.

Table 2: Area occupied by each Biogeoclimatic Zone, Subzone, and Variant combination within the Quesnel TSA

BGC Label (Zone, Subzone, Variant)	Zone Name	Subzone Name	Variant Name	Area (ha)
BAFAun	Boreal Altai Fescue Alpine	Undifferentiated	-	6,729
ESSFmv 1	Engelmann Spruce -- Subalpine Fir	Moist Very Cold	Nechako	1,198
ESSFwc 3	Engelmann Spruce -- Subalpine Fir	Wet Cold	Cariboo	66,712
ESSFwcp	Engelmann Spruce -- Subalpine Fir	Wet Cold Parkland	-	15,757
ESSFwcw	Engelmann Spruce -- Subalpine Fir	Wet Cold Woodland	-	24,483
ESSFwk 1	Engelmann Spruce -- Subalpine Fir	Wet Cool	Cariboo	158,230
ESSFv 1	Engelmann Spruce -- Subalpine Fir	Very Dry Very Cold	West Chilcotin	18,249
ESSFvvp	Engelmann Spruce -- Subalpine Fir	Very Dry Very Cold Parkland	-	6,488
ICH wk 4	Interior Cedar -- Hemlock	Wet Cool	Cariboo	78,700
IDF dk 3	Interior Douglas-fir	Dry Cool	Fraser	13,374
IDF xm	Interior Douglas-fir	Very Dry Mild	-	8,349
IMAun	Interior Mountain-heather Alpine	Undifferentiated	-	7,975
MS xv	Montane Spruce	Very Dry Very Cold	-	287,525
SBPSdc	Sub-Boreal Pine -- Spruce	Dry Cold	-	297,451

<b>BGC Label (Zone, Subzone, Variant)</b>	<b>Zone Name</b>	<b>Subzone Name</b>	<b>Variant Name</b>	<b>Area (ha)</b>
<b>SBPSmc</b>	Sub-Boreal Pine -- Spruce	Moist Cold	-	105,739
<b>SBPSmk</b>	Sub-Boreal Pine -- Spruce	Moist Cool	-	223,716
<b>SBPSxc</b>	Sub-Boreal Pine -- Spruce	Very Dry Cold	-	11,216
<b>SBS dk</b>	Sub-Boreal Spruce	Dry Cool	-	720
<b>SBS dw 1</b>	Sub-Boreal Spruce	Dry Warm	Horsefly	84,538
<b>SBS dw 2</b>	Sub-Boreal Spruce	Dry Warm	Blackwater	186,069
<b>SBS mc 1</b>	Sub-Boreal Spruce	Moist Cold	Moffat	9,951
<b>SBS mc 2</b>	Sub-Boreal Spruce	Moist Cold	Babine	112,109
<b>SBS mc 3</b>	Sub-Boreal Spruce	Moist Cold	Kluskus	20,304
<b>SBS mh</b>	Sub-Boreal Spruce	Moist Hot	-	73,801
<b>SBS mw</b>	Sub-Boreal Spruce	Moist Warm	-	134,412
<b>SBS wk 1</b>	Sub-Boreal Spruce	Wet Cool	Willow	125,601
				<b>2,079,408</b>

All five natural disturbance types (NDTs), recognized as occurring in British Columbia, are present within the Quesnel TSA. These can be found in Table 3.

*Table 3: Natural Disturbance Types found within the Quesnel TSA.*

<b>Natural Disturbance Types</b>		<b>BEC Location Summary</b>
<b>NDT1</b>	Ecosystem with rare stand-initiating events.	ESSFwc3, ESSFwcw, ESSFwk1 ICHwk4
<b>NDT2</b>	Ecosystems with infrequent stand-initiating events	ESSFmv1, ESSFxv1 SBSwk1
<b>NDT3</b>	Ecosystems with frequent stand-initiating events	MSxv SBPSdc, SBPSmc, SBPSmk, SBPSxc, SBSdw1, SBSdw2, SBSmc1, SBSmc2, SBSmc3, SBSmh, SBSmw
<b>NDT4</b>	Ecosystems with frequent stand-maintaining fires	IDFdk3, IDFxm
<b>NDT5</b>	Alpine Tundra and Subalpine Parkland ecosystems	BAFAun ESSFwcp, ESSFxvp IMAun

Historically, forest ecosystems within NDT1 were usually uneven-aged or multi-storied even-aged, with regeneration occurring in gaps created by the death of individual trees, or small patches of trees. When disturbances occurred, such as wind, fire, and landslides, they were generally small, and resulted in irregular edge configurations, and landscape patterns. NDT1 occurs in about 16 percent of the ecosystems of the Quesnel TSA.

Within NDT2 ecosystems, stands were historically usually even-aged, but extended post-fire regeneration periods produced stands with uneven-aged tendencies, notably in the ESSF Biogeoclimatic

Zones, where multi-storied forest canopies result. Wildfires were often of moderate size (20 to 1000 ha), with unburned areas resulting from sheltering terrain features, higher site moisture, or chance. Many larger fires occurred after periods of extended drought, creating a mosaic landscape dominated by extensive areas of mature forest surrounded by patches of younger forest. About 7 percent of the ecosystems in the Quesnel TSA are considered NDT2.

NDT3 is the dominant natural disturbance type within the Quesnel TSA. It encompasses about 74 percent of the TSA. Historically, these forest ecosystems experienced frequent wildfires that ranged in size from small spot fires to conflagrations covering tens of thousands of hectares. The largest fires in the province occur in this NDT, often exceeding 100 000 ha and sometimes even 200 000 ha.

Natural burns usually contained unburned patches of mature forest that were missed by fire. Consequently, these forests produced a landscape mosaic of even-aged regenerating stands ranging in size from a few to thousands of hectares and usually containing mature forest remnants. There were also frequent outbreaks of defoliating insects in this NDT. The resulting mortality ranged from low to severe. Tree mortality within mature forest remnants, and regenerating stands, resulted in dead trees, decaying logs, and canopy gaps. Riparian areas within the forest landscape provided special habitat characteristics not found in the upland areas. The area covered by each NDT can be seen in Table 4.

*Table 4: Natural disturbance types and the amount of area they cover (by hectare) in the Quesnel TSA*

<b>NDT/BEC</b>	<b>Area (ha)</b>
<b>NDT1</b>	328,124
<b>NDT2</b>	145,049
<b>NDT3</b>	1,547,551
<b>NDT4</b>	21,723
<b>NDT5</b>	36,949
<b>Grand Total</b>	<b>2,079,407</b>

As shown in the map below (Figure 5), except for the eastern portion of the TSA and small areas in the south and southwest, ecosystems with frequent stand-initiating events dominate most of the TSA, particularly west of the Fraser River.

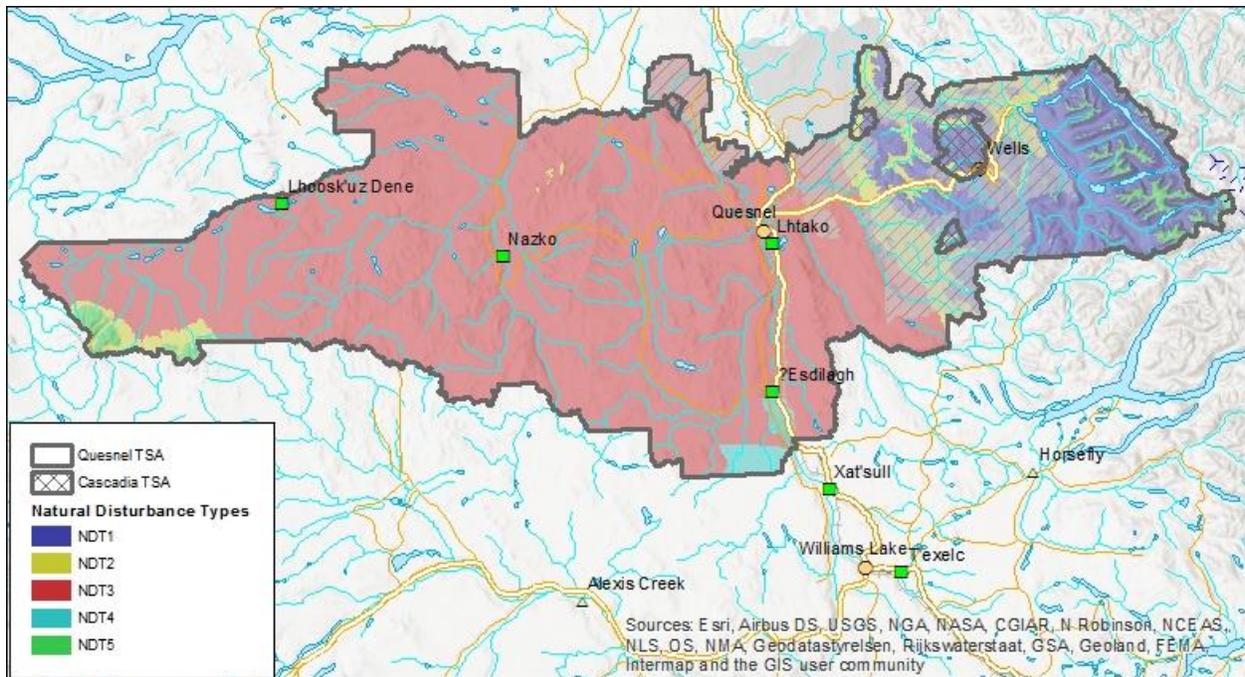


Figure 5: Map of the Natural Disturbance Types and their location within the Quesnel TSA

## 9 Carbon

There are four primary carbon pools at the global scale. These include the lithosphere pool, the ocean pool, the terrestrial biosphere and soil pool, and the atmosphere pool. Forest carbon pools exist in the terrestrial biosphere and soil pool and are made up of tree biomass (foliage, branch, bark, stem wood, coarse roots, and fine roots), dead wood (branches and stem wood), litter, and soil.

Wood products are considered harvested carbon pools (HWP). Through time, carbon will move, or be exchanged, between carbon pools. The movement of carbon is known as fluxes. There are 3 categories of fluxes:

1. **Removals:** carbon will move from the atmosphere into stored carbon pools i.e., photosynthesis.
2. **Transfers:** carbon will move between stored carbon pools (i.e., live needles fall to the forest floor into litter pools).
3. **Emissions:** carbon in stored pools moves into the atmosphere i.e., through wildfire, slash pile burning.

The overall carbon balance of a forest ecosystem is constantly changing over time. The sum of all of the fluxes in a forested area is described as the Net GHG Balance (Greenhouse Gas), with a positive balance indicating the forest is a “source” of emissions at the atmosphere, and a negative balance indicating it is a “sink”, removing carbon from the atmosphere. In Figure 6 below, the Quesnel TSA currently has a positive GHG Balance, and is described as a carbon source. Historically, the Quesnel TSA has had a negative GHG Balance, and served as a sink.

From a climate change perspective, when our forests function as carbon sinks, the terrestrial biosphere pool sequesters carbon that would otherwise remain in the atmosphere. In addition to society’s need to

reduce the emissions from fossil fuels, our forests will be looked upon to provide GHG removals, or reductions, in atmospheric carbon to curb global warming.

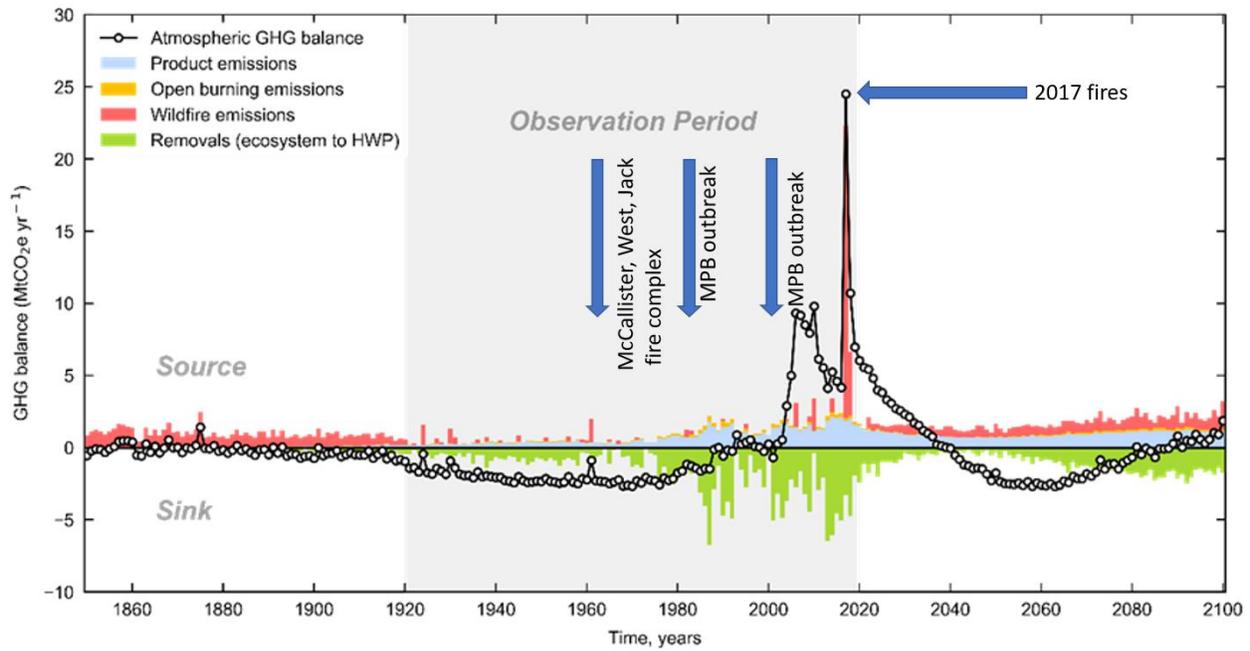


Figure 6: Annual GHG balance Quesnel TSA with driving factors\*

\* Product Emissions = wood products, combustion of energy, and decay of retired product  
 Open Burning Emissions = slash piles  
 Removals = transfer from forest ecosystem to mills

Figure 6 also illustrates the effect wildfire and Mountain Pine Beetle (MPB) have had on the GHG Balance in the TSA. Prior to 1920, the forests acted as a minor carbon sink. As land managers focused on fighting fire after 1920, the forests became more of a carbon sink. As the forest industry expanded and numerous salvage programs were promoted to respond to losses from MPB, the forests started to function as a carbon source. This net carbon balance was amplified dramatically during the more severe fire seasons experienced in the mid 2000's, right up to 2018.

Although the future is uncertain, the frequency of wildfires is projected to double. However, the forests that were established in the mid 1980's will be maximizing their growth in the coming years. Combining this growth with the reduction in short and midterm harvest levels, more carbon is being removed from the atmosphere and stored in growing wood. If this scenario continues, the forest in the TSA may function as a sink again by the 2040s.

## 10 Climate Change

This document provides an overview of observed and projected climate changes in the Quesnel TSA. It is intended as a starting point for the FLP pilot and is not a comprehensive assessment of climate change. This is a simple description of changes in monthly climate variables. Many aspects of climate change are not captured by this approach, such as trends in extreme temperature and precipitation, and in more

sophisticated indices such as drought and fire weather. The results presented in this document can be explored interactively in the supplementary web applications found at <https://bcgov-env.shinyapps.io/ccsummary-Quesnel-cmip6/>.

## 10.1 Temperature

Observed temperature trends in the region are generally consistent with IPCC (International Panel on Climate Change) global climate model projections. The most significant temperature trends have been a dramatic loss of cold winters and a significant departure of nighttime temperatures from natural variability.

Climate models suggest that warming will be greater in summer than in winter. The actual winter climate has warmed faster than the summer. The winter warming trend is driven by a dramatic decline in extremely cold winters. This trend culminated in the extremely warm winters of the 1998-2007 period before falling back to a level more consistent with climate model projections. Summer temperatures are less variable than winter and are expected to depart from natural variability sooner. For example, summers colder than the historical average are projected to be rare after 2050, in the most optimistic scenario (IPCC - SSP1-2.6), and essentially absent after 2040, in the business-as-usual scenario (IPCC-SSP2-4.5).

There are important differences in the observed trends of nighttime vs. daytime summer temperatures. Nighttime summer temperatures are less variable than daytime temperatures, and their observed warming trend is a much more significant departure from natural variability. The trend in nighttime temperature is consistent with IPCC global climate model projections, while the trend in daytime temperature lags the models somewhat. However, this lag is not significant given the natural variability in summer daytime temperatures<sup>3</sup>.

## 10.2 Precipitation

On average, climate models project an increase in precipitation in most seasons. However, this increase is dwarfed by year-to-year variability and is less than decadal variability of precipitation. The implication is that significant long-term trends in hydrology and drought will be driven primarily by changes in temperature rather than precipitation (e.g., decline of snowpack and glaciers, longer snow-free period, and increase in growing-season evaporative demand). The lower-than-usual precipitation of the past 20 years is more likely due to natural variability than due to climate change.

On average across models, precipitation is projected to have no trend in summer, and increase slightly (~8%) in winter. These trends emphasize that natural variability of precipitation is much greater than climate change trends. Interannual variability in precipitation, overlaid on the temperature trend, is a key driver of impacts. For example, the extreme fire year 2018 is clearly visible as a record dry summer. Multi-decadal oscillations of +/-10% in precipitation are also evident. It is important not to confuse these oscillations with climate change trends when comparing observations to global climate model projections. The lower-than-usual winter precipitation of the past 20 years is more likely due to natural variability than due to climate change.

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<sup>3</sup> Overview of climate changes in the Quesnel TSA – Draft for Discussion C. Mahony, March 7, 2022. (Mahony, March 7, 2022).

There is some variation among models in seasonal precipitation trends for the Quesnel TSA, though generally the models do agree on the direction of the trend. All models, but one, project an increase in annual precipitation (ensemble mean 8% increase by 2050). In the growing season, there is general ensemble agreement on a mean 12% increase in May-June precipitation by 2050, but disagreement among models (by +/-20%) on the direction of the trend in July-September. Observed precipitation over the 2001-2020 period was generally lower than the 1961-1990 period. This contradiction of the model trends doesn't indicate that the models are wrong. What it does indicate is that the observed anomaly is subject to decadal oscillations. The effect of these oscillations is reduced in the model projections by averaging across multiple simulations of each model.

Despite the model uncertainty around the direction and strength of precipitation trends, the impact of these trends on ecosystems is strongly mediated by the strong warming trend. This effect is exemplified by the high model agreement on a 10-20% decline in precipitation as snow by 2050. This decline is despite the projected increase in winter precipitation. The ClimateBC estimate of a 13% decline in precipitation as snow over the 2001-2020 period far exceeds the modeled decline, but this is primarily due to the temporarily reduced winter precipitation over this period.

The warming is expected to drive substantial changes in environmental conditions that more directly impact ecosystems, such as the number of frost-free days (Figure 5, right panel). ClimateBC estimates a 10% increase in frost-free days for every degree of warming, on average across the Quesnel TSA, or about 10-20% by 2050. Changes in snowfall and frost will be highly spatially variable across the landscape. In addition, the calculation of these derived variables is based on monthly temperature and precipitation and should be understood as a rough approximation (Mahony, March 7, 2022).

### 10.3 Biogeoclimatic Analogs

The trends towards warmer and wetter conditions can be characterized as a shift from SBPS climates to SBS-like climates (primarily SBSmh & dw1), and from SBS climates to ICH-like climates (primarily ICHdw3 & dw4). These climate analogs are useful for ecosystem management interpretations, but likely are imperfect descriptions of the future climates of the Quesnel TSA.

The projected climates are characterized by a rapid displacement of the MS climates with SBPS-like and SBS-like climates. Assuming precipitation trends roughly follow those projected by global climate model ensemble, this displacement is projected to occur during the next 20 years. In the longer term, (>20 years), the predominant trends are the displacement of SBPS climates by SBS-like climates (primarily SBSmh, dw1, and dw2), and the expansion of ICHdw3 and dw4-like climates. These trends are consistent with the warmer, and wetter, climate projected by the climate model ensemble. However, an important caveat on the projections is that they rely solely on monthly climate data that may not fully represent shorter-duration extremes distinctive of the Chilcotin Plateau. The ICHdw may, therefore, be an imperfect analog for the future climates of the Quesnel TSA. Incorporating daily extremes is a priority for future development of biogeoclimatic analog models (Mahony, March 7, 2022).

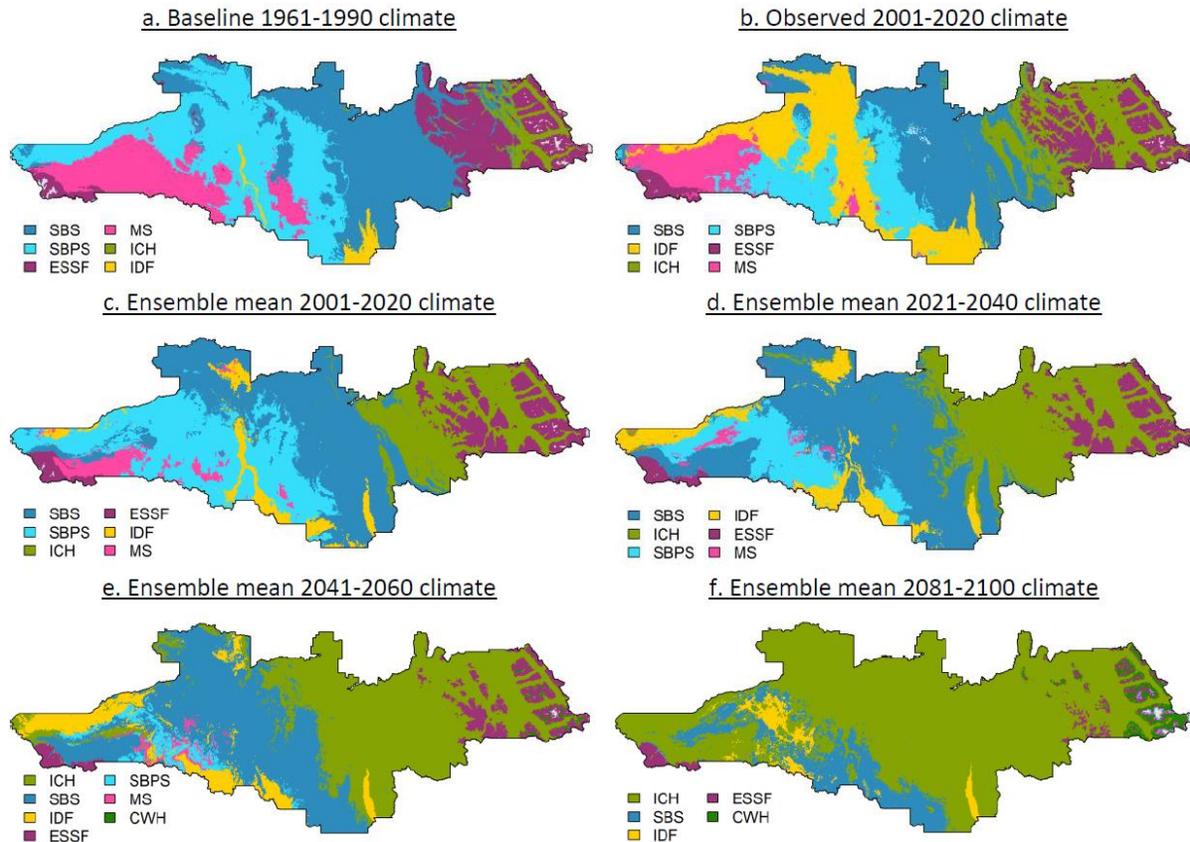


Figure 7: a) the baseline projection is the predicted Biogeoclimatic unit of the 1961-1990 climate. (b) Biogeoclimatic analogs for the observed (actual) 2001-2020 climate. (c-f) the Biogeoclimatic analog with the most votes among the 8-model ensemble. All projections are based on the IPCC-SSP2-4.5 emissions scenario. Analogs are identified at the Biogeoclimatic, subzone/variant level and color-themed by zone<sup>4</sup>.

#### 10.4 Potential Impacts to Forests Inferred from Climate Trends

Current climate trends of warmer winters are more favourable to forest pest overwinter survival, such as the mountain pine beetle which ravaged the TSA in recent decades. Warmer conditions overall can mean some insects can shorten their life cycles, resulting in increased populations. Wet conditions in the spring can be a risk for increasing rust incidence, such as those affecting lodgepole pine. Declines in winter precipitation can increase frost damage (e.g., lack of snow cover to protect trees from cold temperatures), and soil moisture storage available to trees during the growing season<sup>5</sup>.

Based on projections, it is likely that moisture demands from evaporation will increase, as large temperature increases will likely outweigh the minor precipitation increases. Increases in growing degree days, and frost-free period, may mean some vegetation will see enhanced growth, but moisture availability may restrict the opportunities in some areas. The possibility of stressed trees, due to hot dry conditions, will also limit their natural defenses against other disturbances, such as pests and wildfire, both of which are projected to increase as well (Foord, May 17, 2021).

<sup>4</sup> Source: <https://bcgov-env.shinyapps.io/ccsummary-Quesnel-cmip6/>.

<sup>5</sup> (Foord, May 17, 2021)

## 11 Wildfire

### 11.1 Overview

Fire is one of the major abiotic damaging agents that exist within the TSA. Over the past 10 years an estimated 387,226 hectares have burned within the planning area. Of that, approximately 2% (8,409 hectares) have been burned within the established wildland urban interface. This interface area accounts for 218,102 hectares with roughly 38% of the area categorized as high or extreme based on the provincial strategic threat analysis. British Columbia FireSmart® is one of the programs that is working to better inform those that live in interface areas in the province on ways to prepare for wildfire. Within the broader TSA area, information related to fuel treatment options, cultural burning, and prescribed fire will be used to develop future fire management strategies within the QFLP to further wildfire resiliency. Figure 8 outlines the wildfire threat rating within the Quesnel TSA and Figure 9 outlines the wildfire burn severity from 2015-2019.

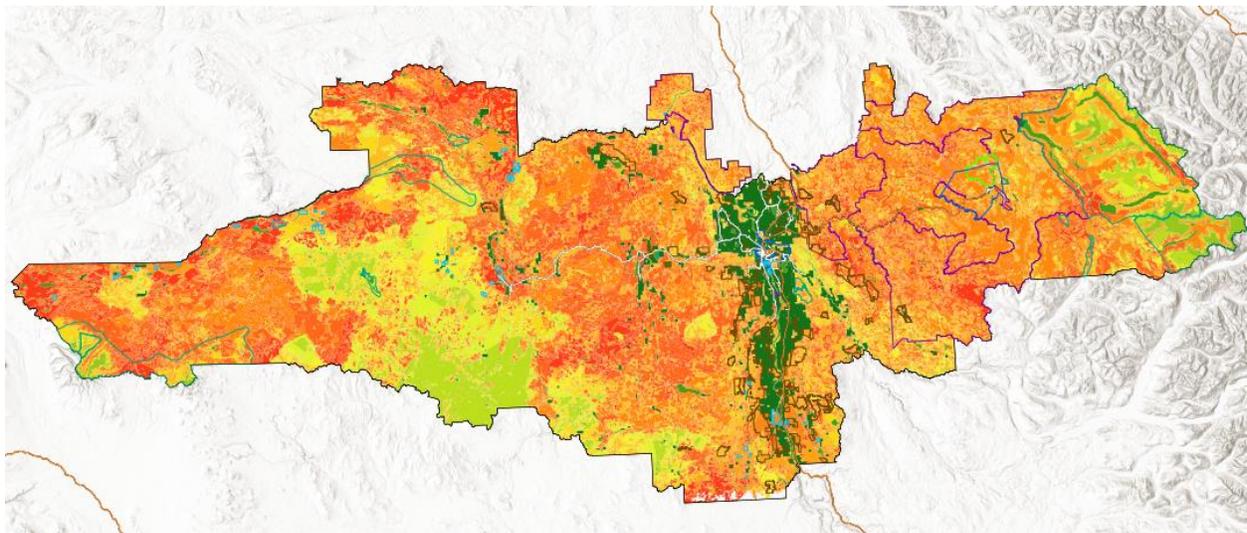


Figure 8: Wildfire threat rating for the Quesnel TSA

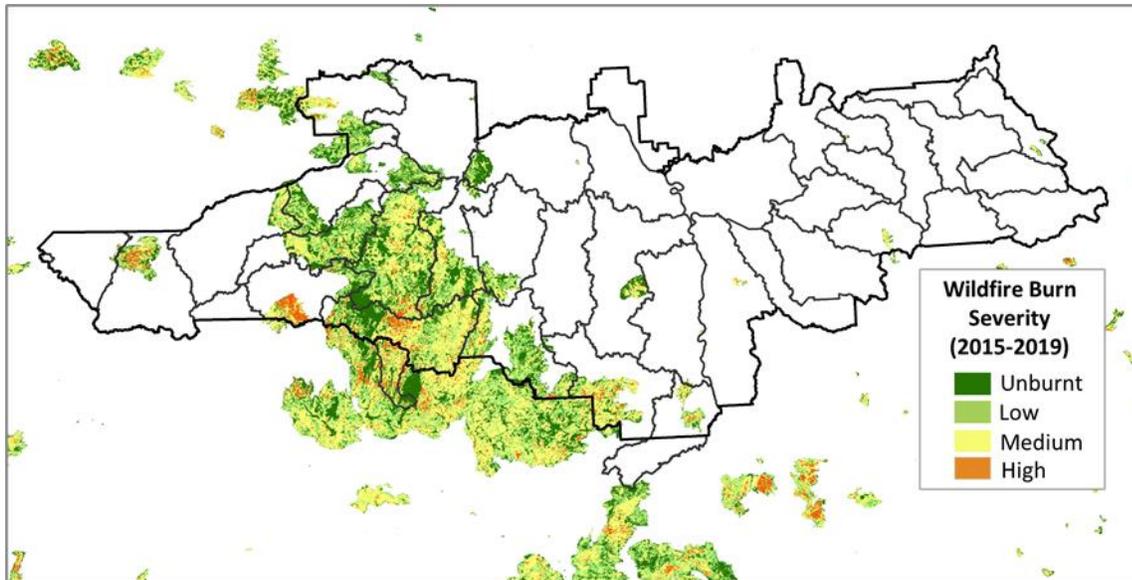


Figure 9. Wildfire burn severity (2015-2019)

## 12 Forest Description

### 12.1.1 Forested Area

Forested ecosystems include non-vegetated (e.g., lakes) and vegetated areas. Vegetated areas are further subdivided based on the presence or absence of trees. Treed areas may include treed wetlands and alpine forests and non-treed areas may correspond to recently disturbed forested areas.

For the purpose of this FLP, forested areas exclude non-vegetated areas, treed wetlands, and areas inherently incapable of growing a tree stand (i.e., non-productive) and roads. Areas previously harvested are considered forested. Areas classified as non-forested and non-productive do not contribute to forest management objectives related to seral objectives for biodiversity.

Within the overall planning area, 1 829 875 hectares – or 88 percent of the area – is forested (Figure 10). Of this amount, 1 458 288 hectares is within the FLP area.

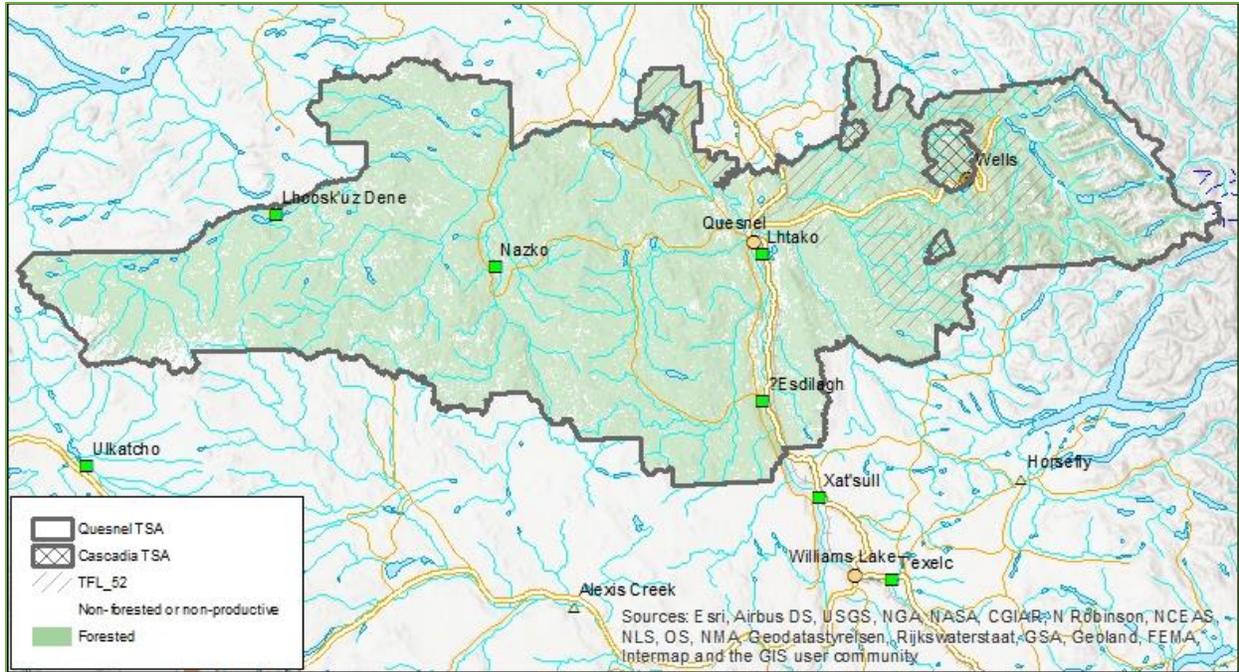


Figure 10: Map Quesnel TSA forested landbase.

### 13 Forest Age Distribution

The composition of plant and animal communities change as forest stands develop through time after a disturbance such as wildfire or timber harvesting. Various life-forms find their habitat requirements during different stages of forest development and most specialist species are associated with either the early stage or the mature to old seral stages.

As seen in Figure 11, below, the forest age distribution within the Quesnel focused FLP area generally reflects the distribution of pine-leading stands. The majority of early seral stands (40 years of age and under) are concentrated in the centre of the TSA while older stands are concentrated at the western and eastern edges of the TSA.

Within the FLP area, about 20 percent of the forested area is less than 20 years of age, mostly as a result of recent wildfires and the mountain pine beetle outbreak and associated timber harvesting. An additional 30 percent of the area is occupied by stands between 81 and 140 years of age and approximately 20 percent of the area is occupied by stands older than 140 years of age. The rest of the area is occupied by stands 41 to 80 years of age.

The age summaries presented in Figure 11 and Table 5, below reflect timber harvesting and wildfire that occurred before January 2020.

Table 5: Summary of area by age class structure of the forested area within the Quesnel TSA.

Age (years)	Area (hectares)	% FLP Forested Area	% Total Forested Area
1 to 20	313,287	21%	17%
21 to 40	166,021	11%	9%
41 to 60	60,830	4%	3%
61 to 80	61,354	4%	3%
81 to 100	154,220	11%	8%
101 to 120	151,315	10%	8%
121 to 140	163,781	11%	9%
140 to 250	267,096	18%	15%
250 +	47,944	3%	3%
no data	72,440	5%	4%
<b>Total FLP Forested</b>	<b>1,458,288</b>	<b>100%</b>	<b>80%</b>
Other Forested	371,586		20%
Non-Forested	249,533		-
<b>Total Area</b>	<b>2,079,407</b>		<b>100%</b>

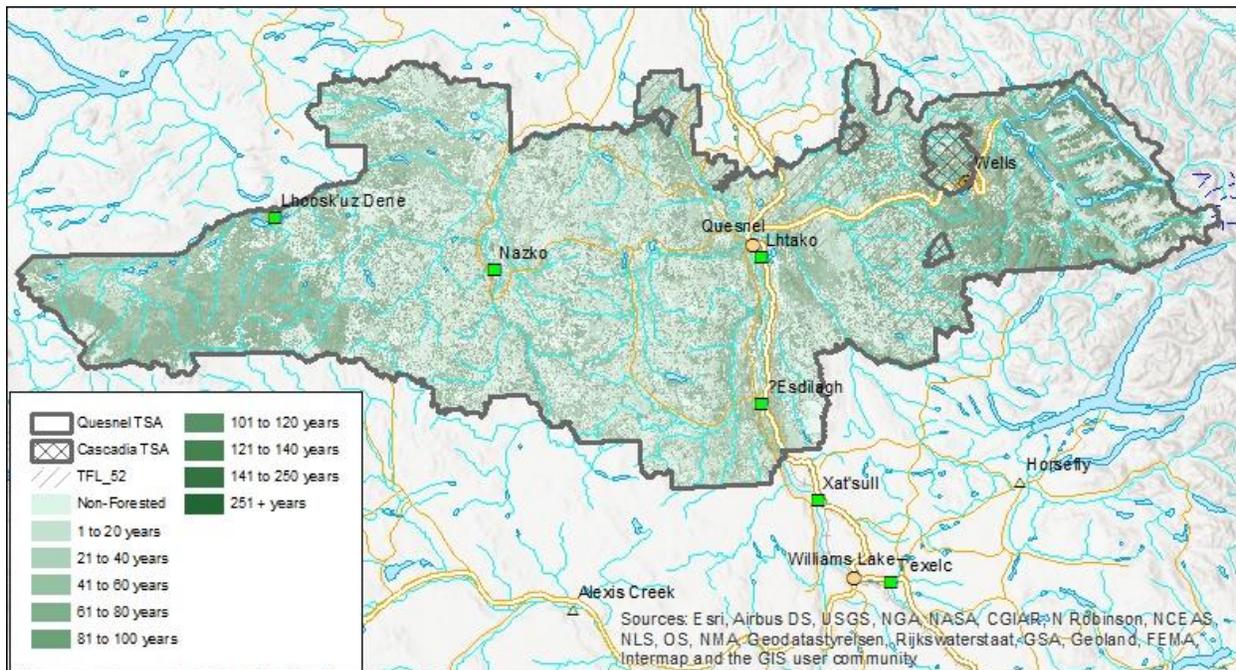


Figure 11: Age class distribution (in years) by forested area (ha) for the Quesnel FLP

### 13.1.1 Leading Tree Species Distribution

Forested areas are classified into forest stands based on the presence of trees possessing sufficient uniformity in composition, age, arrangement, or condition to be distinguishable from each other on

adjoining areas. Within each stand, the tree species with the highest percent composition (e.g., gross volume or for young stands, the relative number of stems per hectare) is considered the leading species.

Within the Quesnel FLP area, most forest stands, approximately 47 percent, are dominated by pine. As shown in Figure 12, these stands are concentrated in the western part of the TSA. Spruce- and balsam-leading stands occupy approximately 30 percent of the forested area and are found throughout the FLP area, with significant concentrations west of Wells and around Bowron Lake Provincial Park. Douglas-fir leading stands occupy approximately 6 percent of the forested area and are mostly located along the Fraser and Nazko Rivers. A small proportion of cedar- and hemlock-leading stands are present along the southeastern and eastern boundaries of the TSA. Deciduous-leading stands, mostly aspen, are also present within the FLP area.

Leading species information is not available for about 12 percent of the forested area. This area corresponds to areas recently harvested, or disturbed by wildfires, which have yet to be inventoried or where reforestation is ongoing.

Figure 12, and Table 6 below, detail the proportion of the FLP area that are occupied by the various tree species. The information presented below is current as of January 2022.

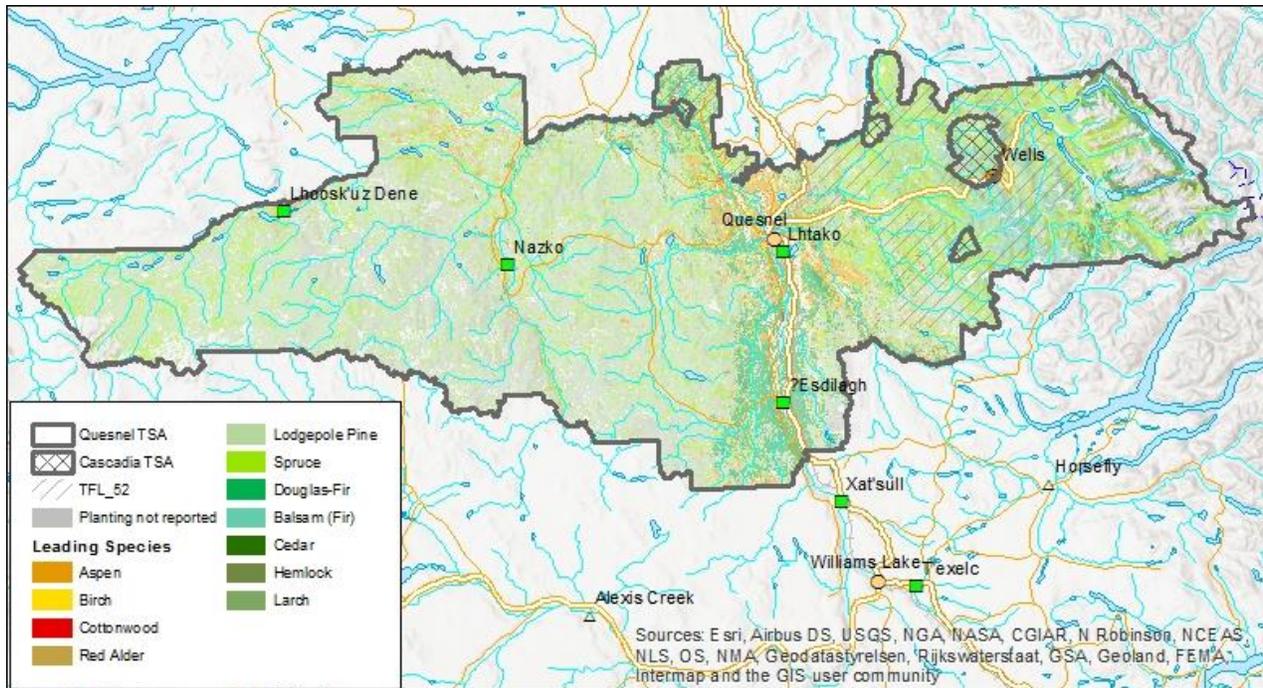


Figure 12: species composition within the Quesnel FLP<sup>6</sup>

<sup>6</sup> (Mahony, March 7, 2022) (Mahony, March 7, 2022) (Mahony, March 7, 2022) (Mahony, March 7, 2022) (Foord, May 17, 2021) (Foord, May 17, 2021)

Table 6: Species distribution by area (ha) and percent of forested area (%)

Species	Area in hectares (ha)	Percent of FLP forested area (%)	% Total Forested Area
Deciduous	<b>71,436</b>	<b>5%</b>	<b>4%</b>
<b>Alder</b>	8	0%	0%
<b>Birch</b>	9,333	1%	1%
<b>Aspen (Poplar)</b>	59,554	4%	3%
<b>Cottonwood</b>	2,541	0%	0%
<b>Conifers</b>	<b>1,208,143</b>	<b>82%</b>	<b>66%</b>
Lodgepole Pine	680,688	47%	37%
Spruce	373,748	26%	20%
Fir/Balsam	52,634	4%	3%
<b>Douglas-Fir</b>	84,035	6%	5%
<b>Cedar</b>	8,872	1%	0%
<b>Hemlock</b>	7,889	1%	0%
<b>Larch</b>	277	0%	0%
Unreported/ Disturbed Areas	178,709	12%	10%
<b>Total FLP Forested Area</b>	<b>1,458,288</b>	<b>100%</b>	<b>80%</b>
<b>Other</b>	<b>371,586</b>	<b>20%</b>	
<b>Forested</b>			
<b>Non-Forested</b>	<b>249,533</b>		
<b>Total Area</b>	<b>2,079,407</b>	<b>100%</b>	

## 14 Silviculture and Stocking Standards

The FSP holder is legally required to replant every area that is harvested, except for special circumstances, such as wildfire fuel breaks. Stocking standards outline how and when reforestation will take place within the Quesnel TSA.

The stocking standards for the Quesnel TSA were developed by a regional team comprised of Ministry staff from the three Cariboo Districts, BCTS, Cariboo region, major licensees, and some representatives from the community forests. The stocking standards were endorsed by the district managers prior to being adopted into the current FSPs.

There is no obligation for licensees to adopt these standards, but the endorsement recognizes that the standards have been fully reviewed and are acceptable for use in FSPs.

The current FSPs outline the process for determining the species that will be planted on the site after harvesting is completed.

The FSP holder conducts a site assessment and identification to determine the appropriate stocking standards as outlined in the tables that can be found in the FSP. The tables are broken out into biogeoclimatic zone, subzone, variant, and site series. These tables will also outline the following for each area:

- Regeneration delay (years)
- Latest free growing year
- Target stocking density
- Minimum stocking density
- Inter tree distance
- Preferred species to plant
- Acceptable species to plant
- Additional standards

The stocking standard section also outlines detailed directions for specific situations, such as mule deer winter ranges, grizzly bear areas, wildfire management, and others.

The Provincial Timber Management Goals, Objectives & Targets, Quesnel TSA<sup>7</sup> document outlines the local timber management targets and strategies that are to be met at the management unit level. These goals and targets are not legal, but instead support local-level planning. Each year a report is created based on data input into RESULTS, an online silviculture tracking system updated by BCTS and licensees. These reports represent a current “state of affairs” for the timber management targets.

Figure 13 outlines the percentage of each species that was planted since 2009 in the Quesnel TSA. The figure outlines that most trees planted were lodgepole pine, followed by spruce and Douglas-fir more recently. (MFLNRORD, 2021)

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<sup>7</sup> [https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/forestry/silviculture/provincial\\_timber\\_targets\\_2019-20\\_status\\_report\\_2021jan18.pdf](https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/forestry/silviculture/provincial_timber_targets_2019-20_status_report_2021jan18.pdf)

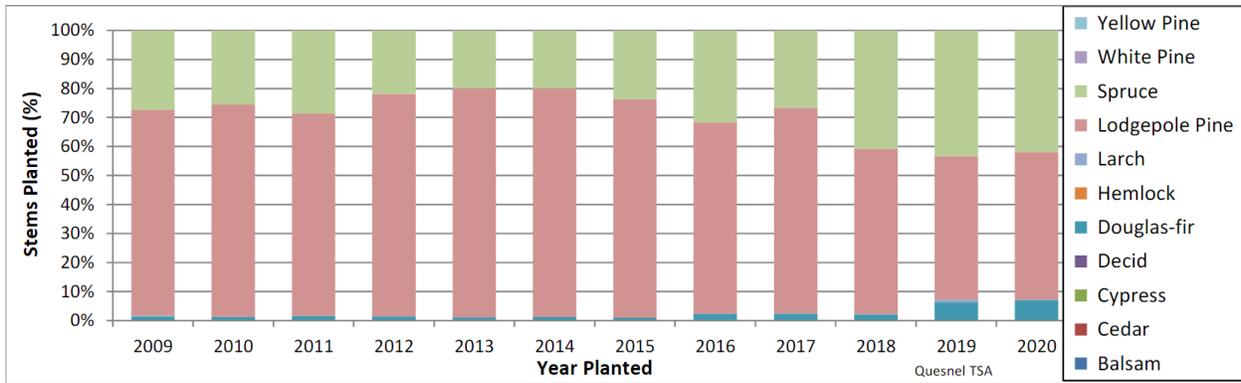


Figure 13. The percentage of species planted each year in the Quesnel TSA between 2009-2020.

Figure 14 provides a synopsis of the amount of area that has been planted and that has been left to naturally regenerate. As there can be a delay in planting, the reporting from 2015 to 2020 is not likely complete. Figure 15 indicates the density of stems planted (stems/ha) within the Quesnel TSA since 2008.

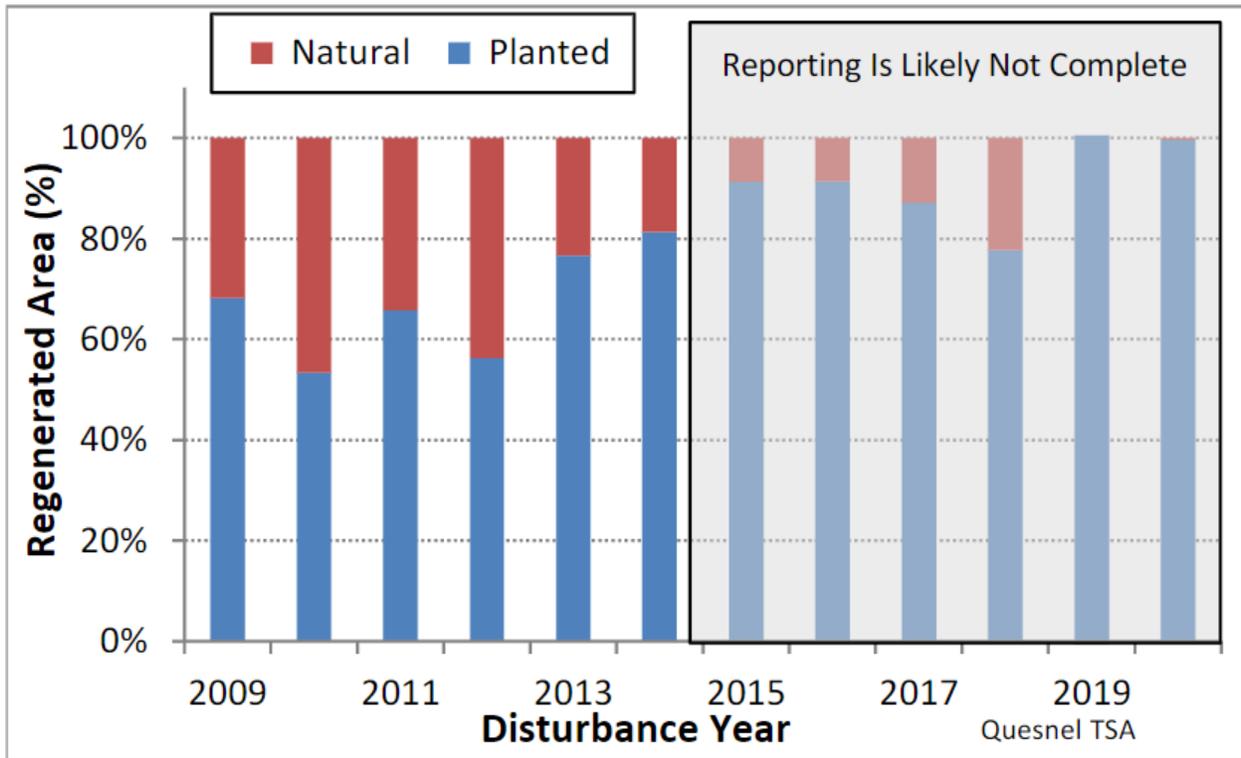


Figure 14. The percentage of area that has been planted and that has been regenerated naturally. Since there is a planting delay, the information from 2015-2020 is not yet completely reported.

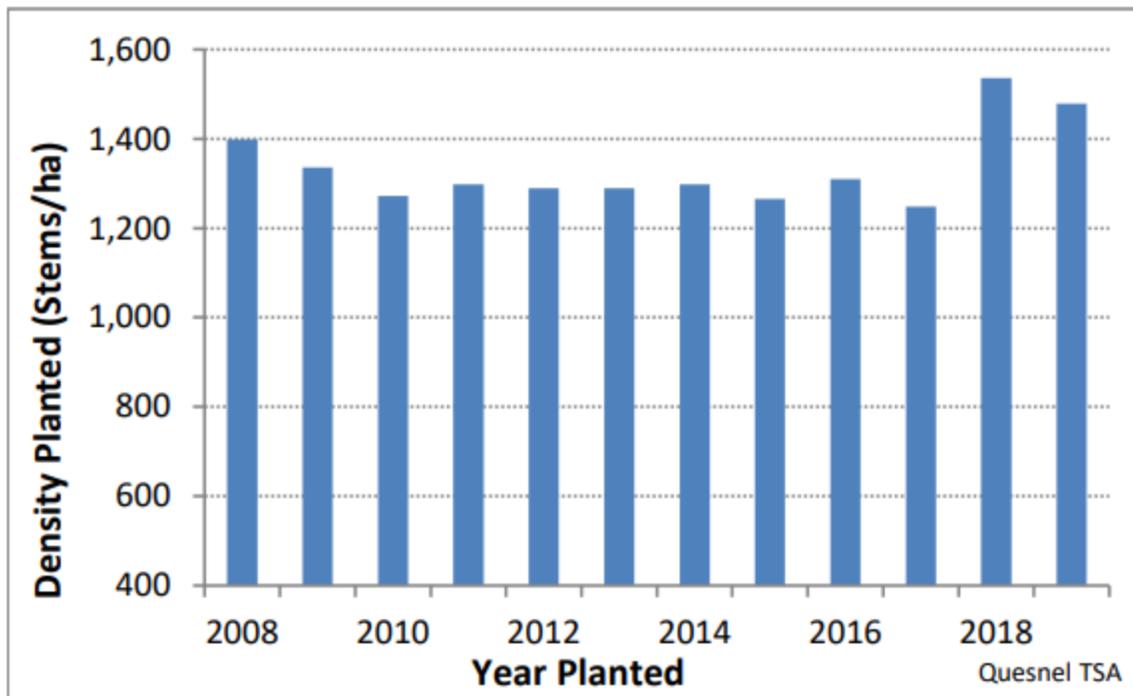


Figure 15. Density of stems (stems/ha) planted within the Quesnel TSA since 2008.

## 15 Forest Health

Proactive forest health management creates forest conditions that can mitigate the impacts of diseases, insects, and biotic factors. FLPs can address future forest biotic and abiotic damage agents by proactively having treatment and mitigation plans in place. Where appropriate mechanisms are part of the proactive FLP forest health plans, the result will be quick and efficient management of forest health outbreaks. Climate change can result in increased losses from forest health damage agents, which will result in greater disruption to rural economies and critical wildlife habitat. Proactive forest health management within FLPs can mitigate these predictable outcomes. It is important to integrate principles of effective proactive forest health management in the FLPs. (BC Ministry of Forests, Feb. 2021)

### 15.1 Quesnel TSA Forest Health Strategy

The Quesnel Natural Resource District Forest Health Strategy 2019/2020 (MFRNRORD, 2020)<sup>8</sup> outlines the status of forest health agents, key tactics, and forest management actions to help address forest health issues. For the purposes of this document, key tactics and forest management actions will not be addressed, as they will be brought to the planning table to help develop future management strategies.

The forest health agents that are included in this strategy are considered to have the potential for significant impacts and/or frequent occurrence within the QFLP. Climate change strategies to address the potential for increased pests are also included in this strategy<sup>9</sup>. This includes the use of tools such as

<sup>8</sup>[https://www.for.gov.bc.ca/ftp/HFP/external/!publish/Forest\\_Health/TSA\\_FH\\_Strategies/Quesnel\\_Forest%20Health%20Strategy%202020.pdf](https://www.for.gov.bc.ca/ftp/HFP/external/!publish/Forest_Health/TSA_FH_Strategies/Quesnel_Forest%20Health%20Strategy%202020.pdf)

<sup>9</sup> <https://www2.gov.bc.ca/assets/gov/environment/natural-resource-stewardship/nrs-climate-change/regional-extension-notes/caribooen160222.pdf>

assisted migration, climate change tree species selection, drought risk, climate change stocking standards, etc.

The detail of the type of damage each forest health agent produces is included in the Cariboo Region Forest Health Strategy's 'Pest Profiles', as well as detail concerning all the forest health factors. If a forest health factor is not listed in Table 7, then it has been given a moderate or low priority ranking and will be managed consistent with the objective contained in the Cariboo Region Forest Health Strategy.

Table 7 outlines the high priority forest health factors, the risk they pose, and the management objective currently being recommended to address them within the Quesnel FLP. These management objectives will help guide the forest health strategy within the FLP.

*Table 7. High priority forest health factors, the risk they pose, and the management objective currently being recommended to address them.*

<b>Forest Health Factor</b>	<b>Probability</b>	<b>Severity</b>	<b>Ranking</b>	<b>Management Objective</b>
<b>Douglas-fir Beetle (IBD)</b>	Moderate	Mod-High	High	Reduce existing populations through sanitation harvesting and trap trees in suppression beetle management units and prevent buildup of beetle populations around fires and windthrow. Monitor in inaccessible areas.
<b>Spruce Beetle (IBS)</b>	Moderate	Moderate	High	Sanitation and salvage harvest in unconstrained areas to recover losses and reduce populations, especially in windthrow. Monitor in constrained or inaccessible areas.
<b>2-year cycle budworm</b>	Moderate	Moderate	High	Monitor, develop treatments and operational trials for high risk stands to spray with (Bacillus thurigiensis var. Kurstani) Btk
<b>Gypsy Moth</b>	Low	High	High	Monitor to detect new occurrences
<b>Western gall rust</b>	High	Moderate	High	Plant higher densities/use mixed species in high hazard areas.
<b>Commandra &amp; Stalactiform rust</b>	Moderate	Moderate	High	Plant higher densities/use mixed species in high hazard areas.
<b>Fire</b>	Moderate	Mod-High	High	Action depending on risk. Follow the fire management plan.
<b>Wind</b>	Low	Moderate	High	Monitor and salvage. Proactive management using good cutblock design, to protect linear reserves.
<b>Mountain Pine Beetle (IBM)</b>	Low	Moderate	Moderate	Salvage in accordance with Chief Foresters guidelines. Monitor new infestations in young stands and remaining mature pine stands.
<b>Western Spruce Budworm (IBB)</b>	Moderate	Moderate	Moderate	Spray areas with moderate to high risk of defoliation with (Bacillus thurigiensis var. kurstani) Btk
<b>Balsam Bark Beetle</b>	Moderate	Low	Moderate	Monitor.

Table 8 summarizes the amount (ha) of bark beetle within trace, light, moderate, severe, and very severe categories within the Quesnel TSA (see Table 7 for beetle codes e.g., IBM, IBS, etc.) with Table 9 providing a description of the severity classes used.

Table 8. Major Bark Beetle (ha) Information for the Quesnel Natural Resource District.

Severity Class	Trace		Light		Moderate		Severe		Very Severe		Total	
	2018	2019	2018	2019	2018	2019	2018	2019	2018	2019	2018	2019
<b>IBM</b>	0	0	0	60	0	0	0	0	0	0	0	60
<b>IBS</b>	253	1,793	218	337	35	0	0	0	0	0	506	2,130
<b>IBB</b>	53,844	53,876	2,025	1,070	16.7	0	0	0	0	0	55,885.7	54,946
<b>2 Year Cycle Budworm</b>	0	0	32,614	1,897	16,595	0	377	0	0	0	49,586	1,897
<b>IDB</b>	396	1,485	5,492	760	3,206	338	0	0	0	0	9,094	2,583
<b>Total</b>	<b>54,493</b>	<b>57,154</b>	<b>7,735</b>	<b>2,227</b>	<b>3,257.7</b>	<b>338</b>	<b>377</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>65,485.7</b>	<b>59,719</b>

Table 9: Description of forest health severity classes from the Quesnel TSA Forest Health Strategy

Severity Class	Description
<b>Trace</b>	<1% of trees in the polygon recently killed
<b>Light</b>	1-10% of trees in the polygon recently killed
<b>Moderate</b>	11-29% of trees in the polygon recently killed
<b>Severe</b>	30-49% of trees in the polygon recently killed
<b>Very Severe</b>	50%+ of the trees in the polygon recently killed

## 15.2 Mountain Pine Beetle

The Quesnel TSA was heavily affected by the Mountain Pine beetle (MPB) outbreak that impacted much of the province over the past 20 years. It is estimated that between 1999 and 2019, the mountain pine beetle killed 87.5 million cubic metres of pine within the timber harvesting land base of the Quesnel timber supply area. Of this volume, about 33.7 million cubic metres – or 38.5 percent – was harvested as of 2019 (Figure 16)

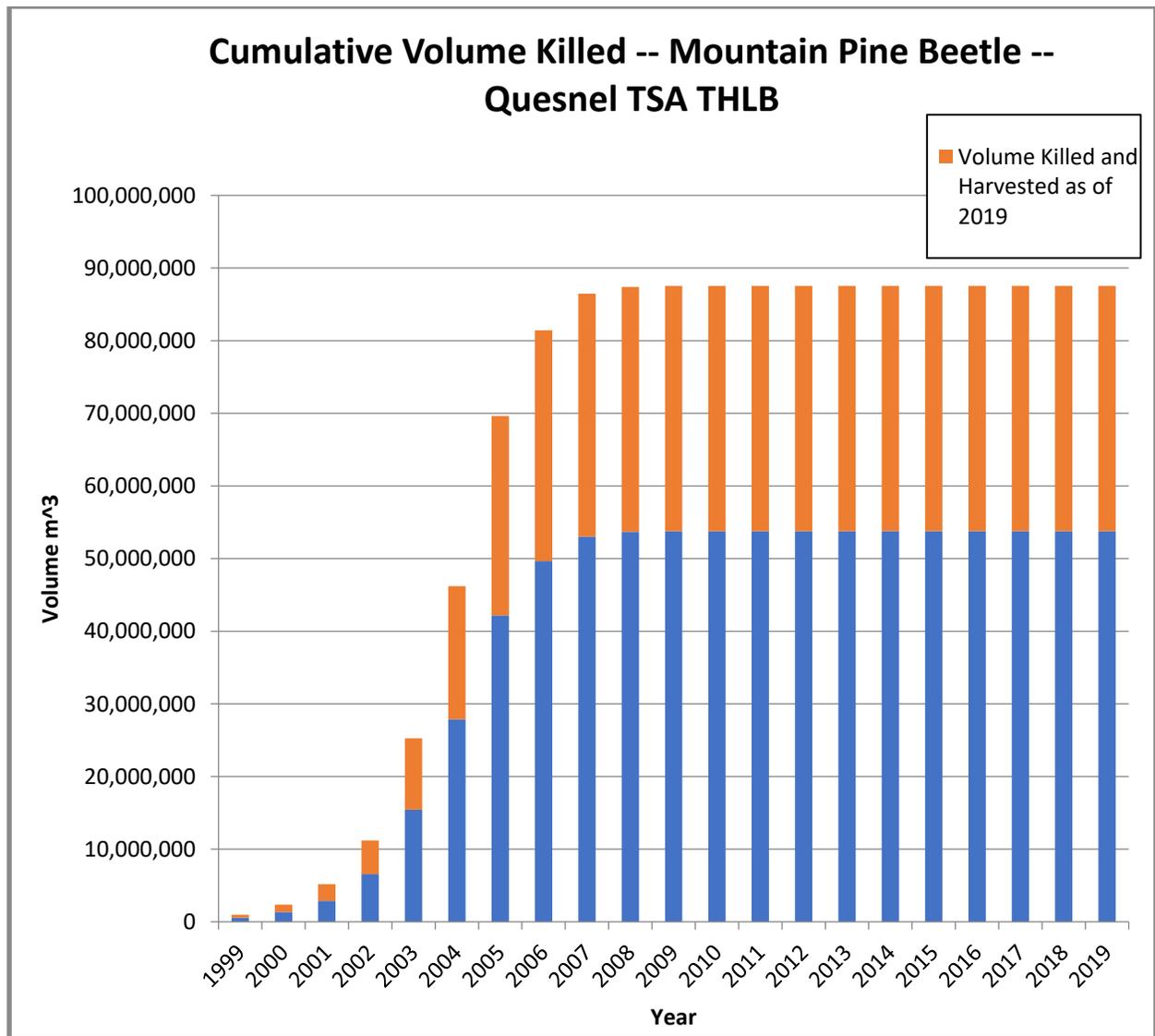


Figure 16: Cumulated volume killed and harvested as a result of the Mountain Pine Beetle Epidemic as of 2019.

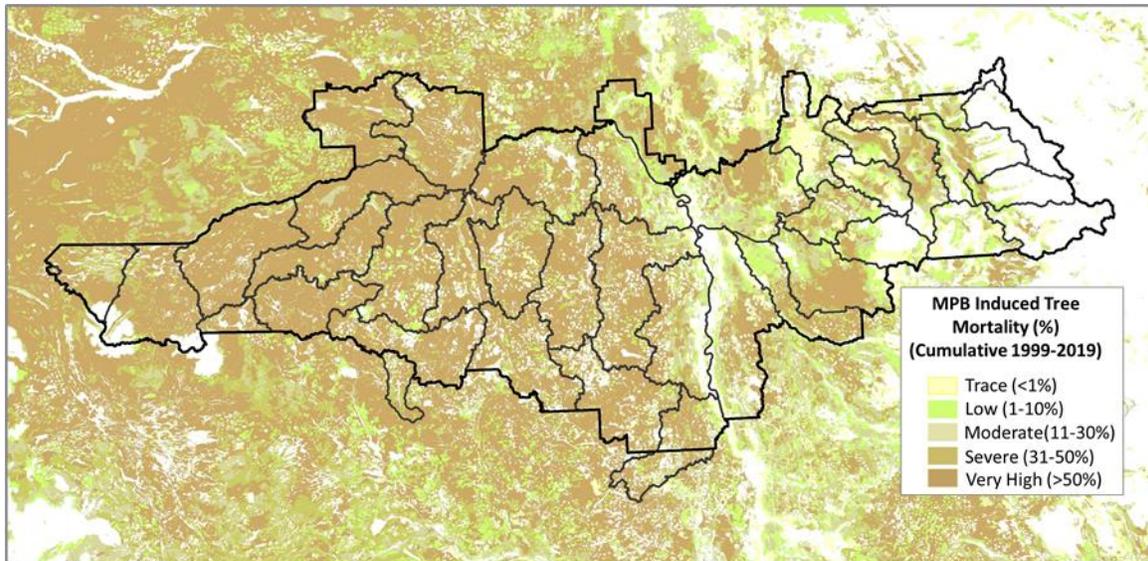


Figure 17. Mountain pine beetle induced tree mortality (1999-2019).

Significant amount of MPB-related dead volume remains on the landbase, especially in the western part of the TSA. There is approximately 34 million cubic metres of dead volume within the FLP area. This estimates includes mortality from MPB and recent wildfires (Figures 17 and 18).

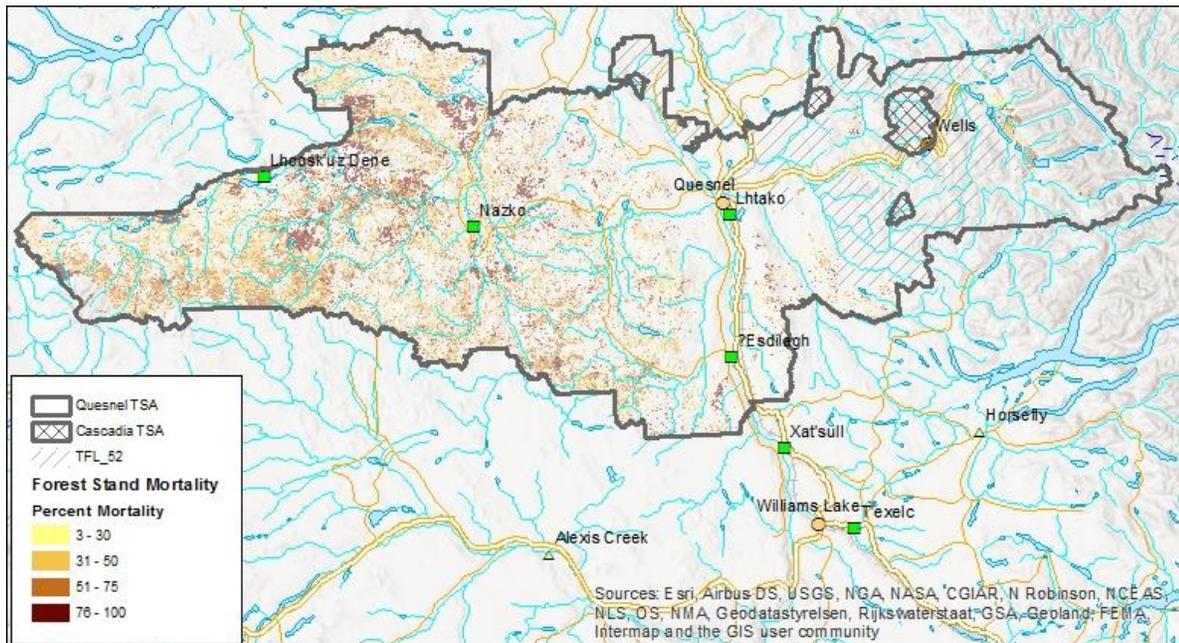


Figure 18. Percent of stand volume killed by the mountain pine beetle.

## 16 Identification and Evaluation of the Current Forest Management and Condition

This section identifies and describes the values, current management, and their current conditions within the Quesnel TSA. This information will present details on the current situation of forest management and offer guidance to the FLP process. It provides an opportunity to review the values currently integrated into forest management, current practices associated with those values, as well as issues, concerns, risks, or vulnerabilities to be reviewed within the context of the FLP.

For each identified value, information is provided, and structured, to be easily integrated into the FLP planning process through the designation of values, objectives, indicators, and targets (VOIT). For each value, the following has been provided:

- Value
  - The defined FLP Value to be included in the FLP process (VOIT).
- Objective
  - The current objectives directing management (VOIT).
- Current Practice
  - The current forest management associated with that value (VOIT) (**these are a summary of FSP and FPPR language and are not the legal wording**).

Practice requirements for objectives set under the Forest and Range Practices Act (FRPA)<sup>10</sup> are defined further in the Forest Planning and Practices Regulation (FPPR)<sup>11</sup>, which guides current forest management practices in BC. The FSPs address several practice requirements found within the FPPR. There are, however, a number of practice requirements that are not referenced to in the FSP as there is no opportunity to propose alternate results and strategies. In these situations, the additional practice requirements are outlined in the current practice section.

There are several maps throughout this section. There is also an online map created to help illustrate where the specific management strategies apply. This map is found here: <https://maps.forsite.ca/QFLP/>. The username is QuesnelFLP and the password is 419QuesnelFLP43.

### 16.1 Soils

#### 16.1.1 Legal Objective

##### 16.1.1.1 FPPR sec. 5

The objective set by government for soils is, without unduly reducing the supply of timber from British Columbia's forests, to conserve the productivity and the hydrologic function of soils.

#### 16.1.2 Current Practice

The FSPs have adopted Sections 35 and 36 of the FPPR, and are also required to adhere to Sections 37, 39, and 40. The following is a summary of the current practices and is not the legal language found in the FPPR or the FSPs.

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<sup>10</sup> FRPA: [https://www.bclaws.gov.bc.ca/civix/document/id/consol31/consol31/00\\_02069\\_01](https://www.bclaws.gov.bc.ca/civix/document/id/consol31/consol31/00_02069_01)

<sup>11</sup> FPPR: [https://www.bclaws.gov.bc.ca/civix/document/id/complete/statreg/14\\_2004#section9.1](https://www.bclaws.gov.bc.ca/civix/document/id/complete/statreg/14_2004#section9.1)

#### *16.1.2.1 Soil Disturbance Limits (Section 35)*

1. Provides soil disturbance limits in respect to primary forest activities; 5% for sensitive soils and 10% for non-sensitive soils based on the net area. No more than 25% of the area covered by a roadside work area can be disturbed.
2. May cause soil disturbance that exceeds the limits if they are removing infected stumps, salvaging windthrow, or constructing a temporary access structure that meets specific requirements.
3. Cannot exceed 25% disturbance over the entire area.
4. The minister may require an agreement holder to rehabilitate an area of compacted soil based on set criteria.

#### *16.1.2.2 Permanent Access Structure Limits (section 36)*

1. Permanent access structures (roads that are not deactivated) cannot exceed 7% of the cutblock unless there is no other practicable option, there are safety issues, or the roads are required for selection harvesting systems, and they limit any additional disturbance.
2. The agreement holder may rehabilitate permanent access structures by specific results or strategies in their FSP or by the criteria laid out in Section 36.

### 16.1.3 Current Condition

#### *16.1.3.1 Permanent Access Structures*

The area-weighted Permanent Access Structures (PAS) percent reported to RESULTS in the last five reporting periods is less than the targeted 7%. The area of non-productive roads, trails, and landings in RESULTS (NO-UNN) versus TSR assumed performance (Max PAS) (MFLNRORD, 2021) . This is less than the targets 5% for sensitive soils and 10% for non-sensitive soils (Figure 17).

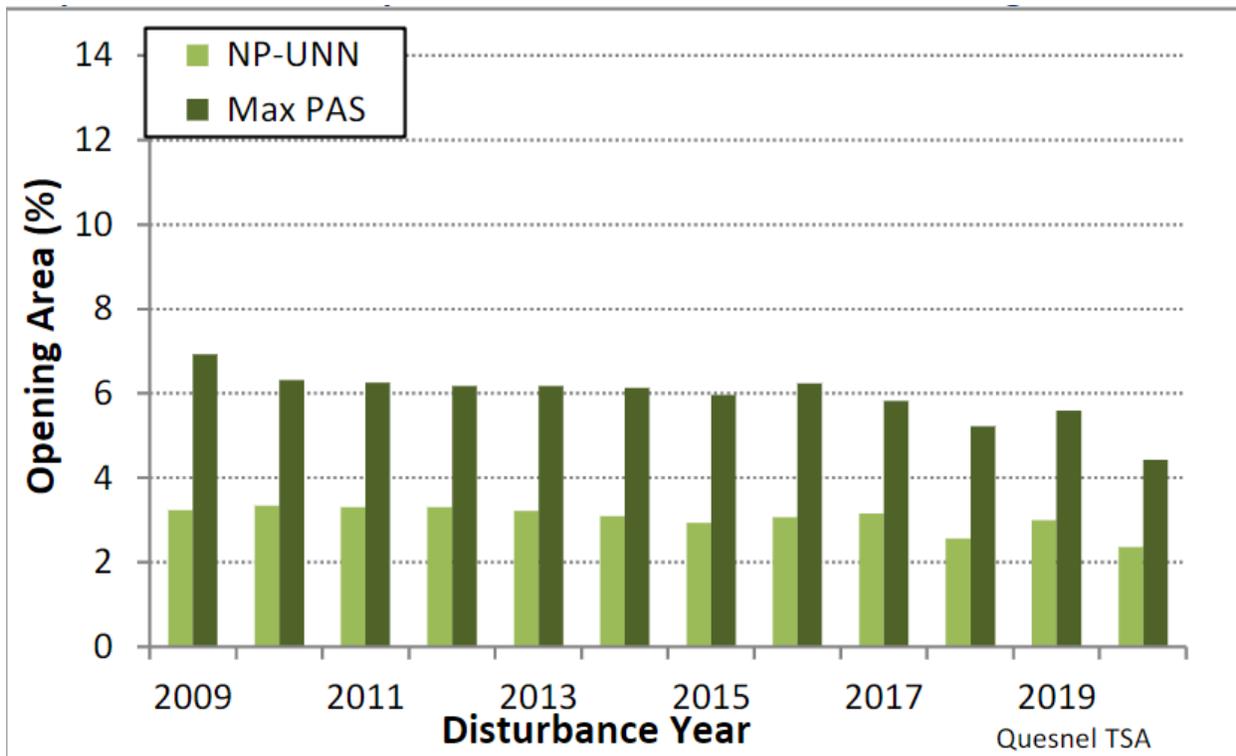


Figure 19. The percentage of permanent access structures by year as reported in RESULTS.

## 16.2 Timber

### 16.2.1 Legal Objective

#### 16.2.1.1 FPPR Section 6

The objectives set by government for timber are to:

- Maintain, or enhance, an economically valuable supply of commercial timber from B.C.'s forests,
- ensure that delivered wood costs, generally, after taking into account the effect on them of the relevant provisions of this regulation and of the Act, are competitive in relation to equivalent costs in relation to regulated primary forest activities in other jurisdictions, and
- ensure that the provisions of this regulation, and of the Act that pertain to primary forest activities, do not unduly constrain the ability of a holder of an agreement under the *Forest Act* to exercise the holder's rights under the agreement.

#### 16.2.1.2 CCLUP 90-day report

Timber targets provide assurance to the forest industry regarding access, for development, to the forest land base. They are a firm commitment by the government arising from the CCLUP process. The levels of access are as follows:

- Special Resource Development Zone
  - Access to 70% of the timber from the productive forest landbase, with a maximum of 30% netdown for other values
- Integrated Resource Management Zone
  - Access to 81% of the timber from the productive forest landbase, with a maximum of 19% netdown for other values
- Enhanced Resource Management Zone

- Access to 83% of the timber from the productive forest landbase, with a maximum of 17% netdown for other values

The 90-day report also recommended targets for 3 levels of timber harvest across the 3 zones broken into the following categories:

- **Conventional:** The portion of the total forest available for conventional harvest systems. Conventional management is defined as the current industry norm, including any standard prescribed practices.
- **Modified:** The portion of the total forest available for harvest using modified practices in recognition of other resource values. This will include a wide range of modified practices with the selection determined by the specific circumstances on a site-specific basis. Many such modified practices are currently in use. This category provides considerable opportunity for industry to develop areas while retaining other resource values.
  - Depending upon the value to be managed for, these resource values can be addressed through a wide spectrum of modified regimes, including:
    - adjusted cutblock size or shape to retain visual quality;
    - modified clearcut systems, such as small patch clear-cut, feathered edges, green tree retention, or deciduous tree retention;
    - alternative harvesting systems, such as highlead, helicopter, small machinery or horse-logging; and
    - alternative silvicultural systems, such as selection or shelterwood.
- **No Harvest:** The portion of the total forest that, due to other resource values, is not presently available for harvest under current forest management regimes. Some of these areas are expected to become available in the future provided that retention of the other resource values, particularly wildlife, can be ensured.

These targets were intended to help guide implementation of the CCLUP and maintain the balance envisioned by it. The sub-unit timber targets were "...not intended to be use in an accounting exercise whereby each cutting permit is evaluated as to which category it falls into, rather they are intended to guide subsequent planning exercises and to facilitate site-specific solutions to resource management issues." (90-day report pg. 47). The 1995 definitions for "conventional" and "modified" harvest are no longer relevant, therefore the sub-unit timber targets remain as guidance only and cannot be tested for over time.

The following sub-unit timber targets are presented to help guide conversations around timber access within each sub-unit, as it helps to show the relative sensitivity to harvest within each sub-unit.

#### *16.2.1.3 Quesnel SRMP Timber Harvesting Targets*

The following table outlines the timber harvesting targets for each resource development zone within the Quesnel TSA.

Table 10: Quesnel SRMP Timber Harvesting Targets

	% Of productive forest		
	Conventional Harvest	Modified Harvest	No Harvest
<b>Enhanced Resource Development Zones</b>			
<b>Baezaeko</b>	73	11	16
<b>Nazko</b>	81	10	9
<b>Quesnel</b>	60	34	6
<b>Cottonwood</b>	79	10	11
<b>Batnuni</b>	84	10	6
<b>Beaver Valley</b>	62	32	6
<b>Integrated Resource Management Zones</b>			
<b>Kluskus</b>	39	46	15
<b>Chezacut</b>	61	27	12
<b>Special Resource Development Zones</b>			
<b>Itcha Ilgachuz</b>	10	58	32
<b>Upper Blackwater</b>	20	40	40
<b>Lower Blackwater</b>	31	55	14
<b>Quesnel Highlands</b>	34	32	34
<b>Quesnel Lake</b>	7	60	33

### 16.2.2 Current Practice

There are no specific timber practices that are outlined in the FSPs. The current management for the timber objectives is achieved through multiple other results and strategies found in the FSPs.

### 16.2.3 Current Allowable Annual Cut and Licenses

The Quesnel TSA has a current allowable annual cut (AAC) of 2,607,000 m<sup>3</sup> per year. This AAC is partitioned into three categories of harvesting:

- Dead volume – 1,230,000 m<sup>3</sup>
- Deciduous leading stands – 127,000 m<sup>3</sup>
- Live volume – 1,250,000 m<sup>3</sup>

By law, the AAC must be determined at least once every 10 years. The current AAC was determined by the chief forester on June 16, 2017.

Once an AAC has been determined by the chief forester, it may be apportioned by the minister under various categories of timber licensing agreements. In the Quesnel TSA, these include replaceable and non-replaceable forest licenses. Each forest license specifies the amount of volume that can be harvested. The following table outlines the current forest licenses that exist in the Quesnel TSA.

Table 11 outlines the forest tenures that currently exist within the Quesnel TSA.

Holder	Licence Type	Licence Number	Total Volume (m <sup>3</sup> )
West Fraser Mills Ltd.	Replaceable	A20005	192,826
West Fraser Mills Ltd.	Replaceable	A20011	382,194
West Fraser Mills Ltd.	Replaceable	A20013	400,790
Tolko Industries Ltd.	Replaceable	A20010	259,704
Eberding Timber Ltd.	Replaceable	A78603	2,034
Lhoosk'uz Dene Nation	Replaceable	A93684	35,667
Red Bluff Development Corp.	Replaceable	A93963	33,067
Nazko First Nation	Replaceable	A94469	45,967
?Esdilagh First Nation	Replaceable	A95405	35,813
Ulkatcho First Nation	Replaceable	A97622	11,986
BCTS	Replaceable		500,000
Forest Service Reserves	Replaceable		30,000
Pacific Bioenergy Timber Corp.	Non-Replaceable	A76553	350,000
Lhtako Energy Corp.	Non-Replaceable	A86736	37,500
<b>Total</b>			<b>2,961,731</b>

Figure 20 shows a comparison between the AAC and the actual scaled volume (harvested) for each year. The figure indicates that harvest levels have been below the AAC since 2013. (MFLNRORD, 2021).

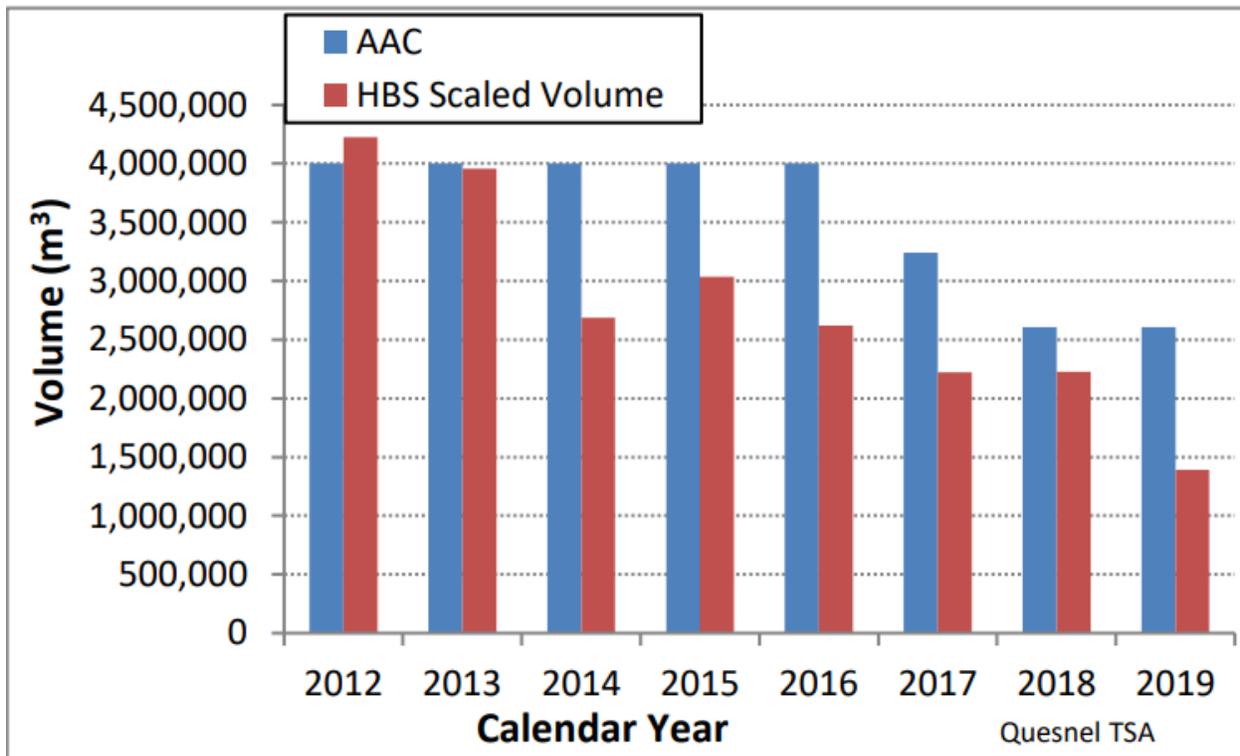


Figure 20. A comparison between the Quesnel TSA AAC and the actual scaled volume for each year from 2012-2019.

#### 16.2.3.1 Quesnel District Harvest Summary

The Quesnel Forest District has compiled the 2019-2020 harvest data to summarize the timber profile that is currently being harvested in the Quesnel TSA. The Ministry of Forests, Lands, and Natural Resource Operations Harvest Billing System was used to generate Mark Monthly Scaling History Reports. At the time of the report, December 2020 volumes were not available.

#### 16.2.3.2 Harvest Breakdown by Species

Table 12 outlines the species breakdown of harvest volumes in the Quesnel TSA for 2019 and 2020.

Table 12: Species breakdown by harvest volumes in the Quesnel TSA for 2019 and 2020.

Species	Volume (m³)	
	2019	2020
Aspen	2,157	4,134
Balsam	111,113	194,223
Birch	182	1,116
Cedar	110	3,538
Cottonwood	134	1,214
Douglas-Fir	143,860	227,520
Hemlock	133	2,688
Lodgepole Pine	840,007	579,288
Spruce	344,329	467,117
<b>Total</b>	<b>1,442,027</b>	<b>1,480,837</b>

## 16.3 Wildlife

### 16.3.1 Wildlife (General)

#### 16.3.1.1 Legal Objectives

##### 16.3.1.1.1 FPPR Sec. 7

The objective set by government for wildlife is, without unduly reducing the supply of timber from B.C.'s forests, to conserve sufficient wildlife habitat in terms of amount of area, distribution of areas, and attributes of those areas, for

- a. The survival of species at risk;
- b. The survival of regionally important wildlife, and
- c. The winter survival of specified ungulate species.

##### 16.3.1.1.2 CCLUP 90 Day Report (Appendix(s) 3 and 4 pg. 153), LAO objectives 32-34

To manage for grizzly bear, moose, furbearer, species at risk, and other sensitive habitats within the areas identified as riparian buffers, recreation areas, mule deer winter range, and lakeshore management zones and throughout the polygon under the biodiversity conservation strategy.

#### 16.3.1.2 Current Practices

FPPR and the CCLUP outline objectives for general and specific wildlife management. Sections 15.3.2 to 15.3.9 outline the specific wildlife values that are managed in the Quesnel TSA.

Some species at risk are also managed under GAR, with an assigned WHA, and others are managed with a GAR, without an assigned WHA. FSP holders results and strategies must ensure that all primary forest activities will conform to these requirements along with section 15.3.1 (wildlife general).

In addition to the specific wildlife results and strategies outlined above, the FSP holder will complete a general assessment and management approach for the species found in Table 13. The approach will consist of the following:

Table 13: List of current Species at Risk within the Quesnel TSA that are managed using wildlife general results and/or strategies.

<b>Amphibians</b>	<b>Fish</b>	<b>Mammals</b>	<b>Birds</b>
North American Racer Snake	Bull Trout	American Badger	Brewer's Sparrow
Great Basin Gopher Snake		Fringed Myotis	Burrowing Owl
Great Basin Spade-footed Toad		Mountain Goat	Yellow-Breasted Chat
		Spotted Bat	Flammulated Owl
		Wolverine	Lewis's Woodpecker
			Prairie Falcon
			Sandhill Crane
			Sharp-Tailed Grouse
			Short-eared Owl

1. The general assessment consists of a GIS data analysis of the area (1000 m buffer) around the proposed cutblocks and roads to determine if there are any noted occurrences in the vicinity of the development.
2. During the development of the road, or cutblock, a field observation form will be used to document any sightings of the species, species use, or key habitat needs.
3. If there are any documented sightings, a Qualified Resource Professional (QRP) will complete an assessment for the proposed cutblock, or road, to mitigate the impacts on the species that is consistent, to the extent practicable, with current best management practices and reports.
4. If a species listed above is observed during harvesting or road construction, a QRP will conduct an assessment as outlined in Section 3 (above).
5. The FSP holder will ensure that the recommendations from the assessment are followed to the extent practicable.

## 16.3.2 Moose

### 16.3.2.1 *Legal Objective*

#### 16.3.2.1.1 LAO Objective 32

Retain sufficient vegetation to provide security and thermal cover for wintering moose adjacent to high value wetlands as defined by the spatial data set Cariboo Chilcotin High Value Wetlands for Moose, and adjacent to W1, W3 or W5 wetlands, including shrub-carrs.”

#### 16.3.2.1.2 CCLUP 90 Day Report

To manage for grizzly bear, moose, furbearer, species at risk, and other sensitive habitats, within the areas identified as riparian buffers, recreation areas, caribou habitat and lakeshore management zones and throughout the polygon under the biodiversity conservation strategy.

#### 16.3.2.1.3 CCLUP (Appendix 4 Page 155)

The overall objective is to maintain habitat through maintenance of:

- Forested buffers around wetlands and riparian areas,
- Cover and early seral (shrubby) upland winter habitats,
- Other aspects of moose habitat needed on a site-specific basis, including calving areas and summer habitat protection,
- Careful access management, including limitations on permanent access, deactivation of temporary roads, and limiting road crossings of wetlands and riparian areas as much as possible.

### 16.3.2.2 *Current Practices*

The current moose management strategy is designed around managing thermal and security cover around key wetland areas, while also managing road construction and densities.

1. Within a High Value Moose Wetland Management Zone (HVMWMZ) or a Moose Management Zone (MMZ); FSP holders will not cause the area to have:
  2. less than 30-60% (depending on BEC zone) of thermal cover, and
  3. less than 60-80% (depending on BEC zone) of security cover.
4. All thermal and security cover will be in patches greater than or equal to 100 m wide, greater than 2 ha and not greater than 400 metres apart where more than one patch is established.
5. Small (< 6 ha) HVMWMZ or MMU do not require clause 2.

6. Will not construct a new permanent road within HVMWMZ or MMU unless there is no practicable alternative.
7. When cutblocks are harvested within 500 metres of HVMW, the FSP holder will establish and/or maintain a visual screen until free growing and establish access controls to eliminate vehicular access into the cutblock.
8. For areas where the road layer densities exceed 0.6 km/km within 1000 metres of a HVMW, all new roads will be deactivated or have access controls to eliminate vehicular access.

There is a total of 15,971 hectares within HVMWMZ. Of this amount, 12,957 hectares – or 81 percent – are within the FLP area (Figure 21).

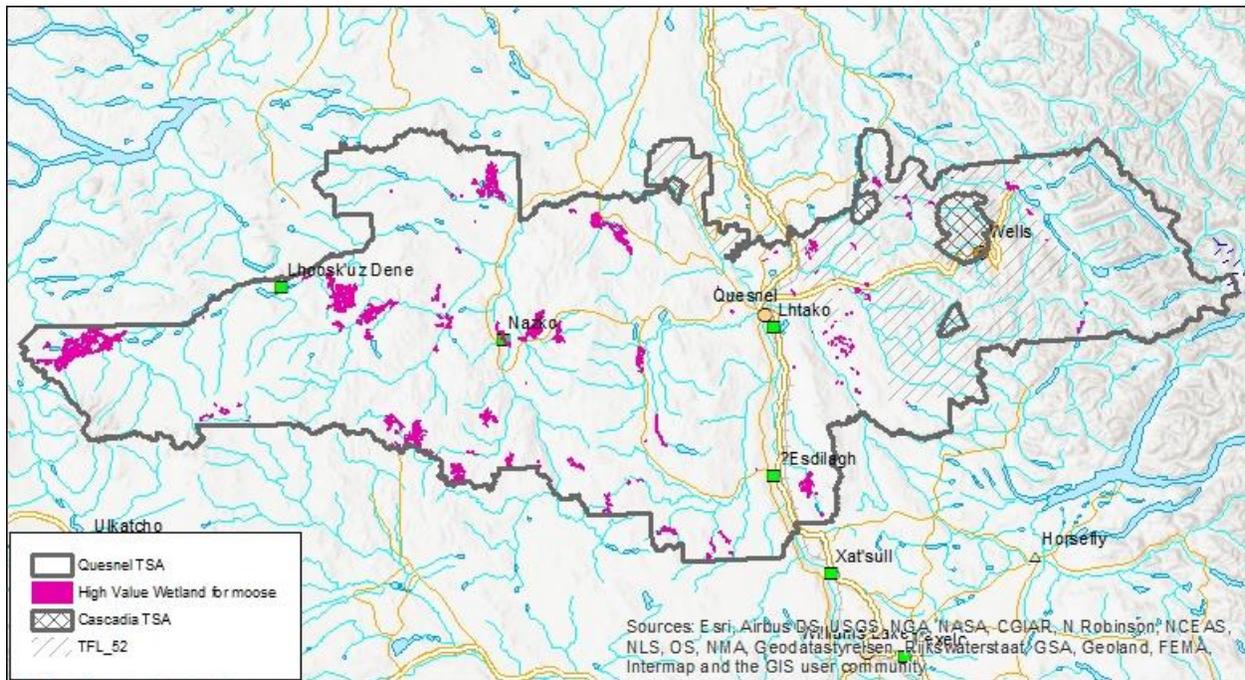


Figure 21: Map of High Value Moose Wetlands in the Quesnel TSA.

### 16.3.3 Mule Deer

#### 16.3.3.1 Legal Objectives

##### 16.3.3.1.1 CCLUP 90 Day Report

To maintain Mule Deer winter range values through modified harvest regimes.

#### 16.3.3.2 Current Practice

The Quesnel TSA has a mule deer GAR order that directs Mule Deer management. The FSP holders adopt the results and strategies outlined in the GAR order.

The GAR Order defines General Wildlife Measures to management Mule Deer Winter Ranges, including the following:

- Appropriate Silviculture systems
- Protection of existing Douglas-Fir regeneration to the extent practicable
- Criteria for entering a stand to complete harvesting

- Required stand structure habitat classes, including area harvested per pass, minimum cutting cycles, rotation age and number of different aged patches
- Post-harvest Douglas-Fir composition
- Patch opening sizes
- Skid trail, road and landing guidelines
- Exemptions for Douglas fir beetle sanitation, dead lodgepole pine stands and thinning from below.

The total area identified for deer management is 66,232 hectares. Of that amount, 45,697 hectares – or 70 percent – are within the FLP area (see Figure 22).

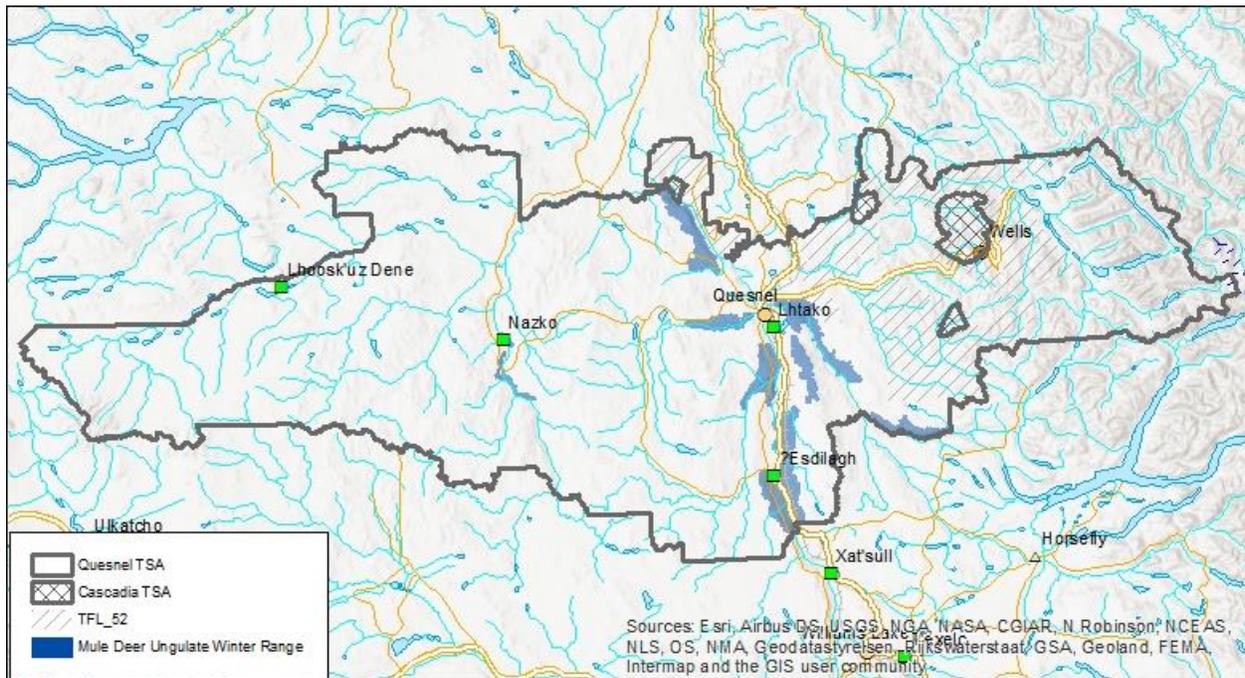


Figure 22: Map of Mule Deer Ungulate Winter Ranges within the Quesnel TSA.

#### 16.3.4 Mountain Caribou (Eastern) and Northern Caribou (Western)

##### 16.3.4.1 Legal Objectives

###### 16.3.4.1.1 CCLUP 90 Day Report- Appendix 3

1. To maintain caribou habitat as per the Quesnel Highlands Caribou strategy.
2. To Maintain Caribou habitat as per the Itcha/Ilgachuz Caribou strategy.
3. To manage for grizzly bear, moose, furbearer, species at risk and other sensitive habitats within the areas identified as riparian buffers, recreation areas, caribou habitat and lakeshore management zones and throughout the polygon under the biodiversity conservation strategy.

###### 16.3.4.1.2 CLLUP 90 Day Report - Appendix 4 (pgs. 156 & 157)

“...manage lower elevation habitats including winter ranges and travel corridors as they are identified. Where possible and where compatible with other conservation needs, they may be met through Forest Ecosystem Networks and old growth reserve requirements within each landscape unit.”

16.3.4.1.3 CCLUP 90 Day Report – Appendix 4 pgs. 157 & 158,  
Implementation of “modified harvest areas”

16.3.4.1.4 Within the Charlotte Alplands SRDZ

“To manage for caribou, grizzly bear, moose, furbearer, species at risk, and other sensitive habitats, within the areas identified as riparian buffers, recreation areas, and lakeshore management zones, and throughout the polygon under the biodiversity conservation strategy.”

16.3.4.2 Current Practice

1. The FSP holder will follow the strategies outlined in the Wildlife General section of this FSP.
2. The FSP holder will adopt the general wildlife measure specified in the GAR order for the applicable Wildlife Habitat Areas. The wildlife measures consist of the following:
  - a. No harvest zones
  - b. Modified harvest zones where there is a limit on harvest openings, prescribed retention and road construction and deactivation standards.
  - c. Protection of arboreal and terrestrial lichen sites
  - d. Exemptions for forest health sanitation.
  - e. Silvicultural practice recommendations and stocking standards.

One ungulate winter range (UWR) and several wildlife habitat area (WHA) GAR orders are in place within the overall planning area to manage caribou populations. These are summarized in the table and figure below.

Table 14: Summary of Ungulate Winter Range and GAR Orders for the Caribou populations within the Quesnel TSA.

GAR ID	Caribou Population	General Wildlife Measure for Timber Harvesting	Total Area (hectares)	FLP Area (hectares)
UWR U-7-003	Mountain (northern)	Conditional Harvesting	2267	0
UWR U-7-003	Mountain (northern)	No Harvest	48	0
WHA 5-086	Northern Mountain	Conditional Harvesting	99,985	99,950
WHA 5-088, 5-089, 5-090, 5-091, 5-092, 5-093, 5-094, 5-095	Southern Mountain	Conditional Harvesting	19,914	13,344
WHA 5-097, 5-098, 5-099, 5-100, 5-101, 5-106, 5-107, 5-108	Southern Mountain	No Harvest	41,256	17,965
WHA 5-118	Northern Mountain	No Harvest	57,262	57,262
WHA 5-872	Northern Mountain	Conditional Harvesting	5,952	5,952
WHA 5-873	Northern Mountain	Conditional Harvesting	10,276	10,276
<b>Total</b>			236,960	204,749

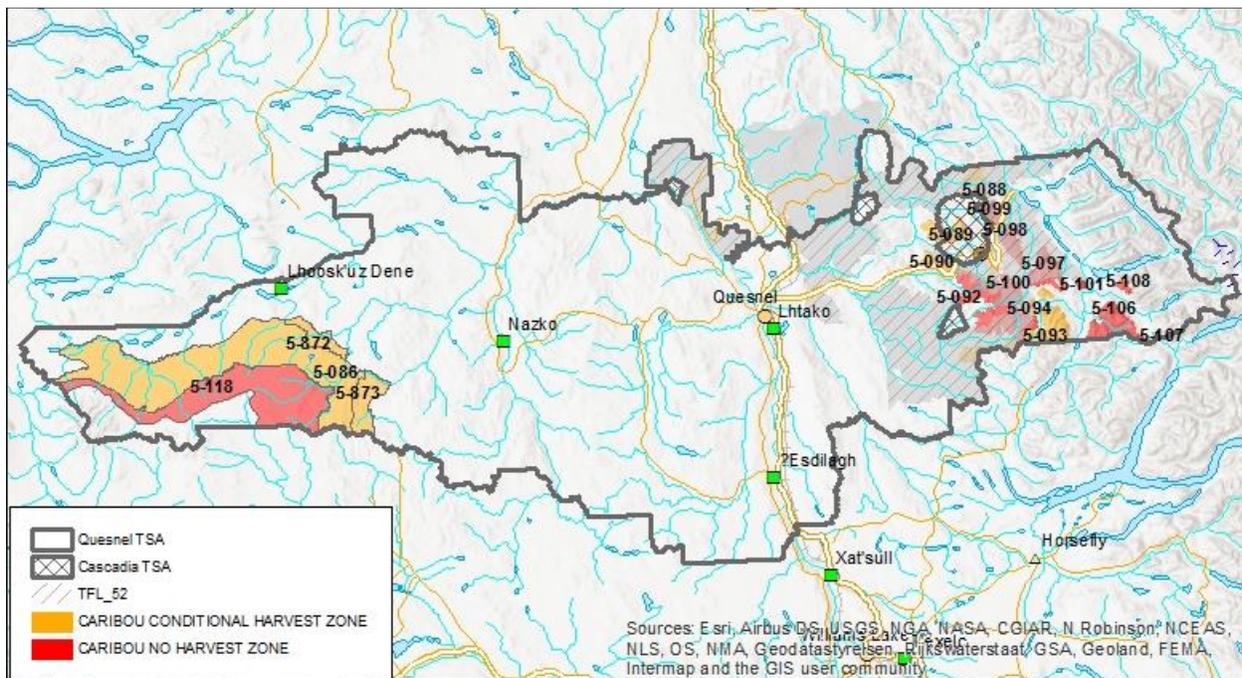


Figure 23: Map of the GAR Orders and WHA for Caribou within the Quesnel TSA.

### 16.3.5 Grizzly Bear

#### 16.3.5.1 Legal Objectives

##### 16.3.5.1.1 CCLUP 90 Day report Appendix 3

To manage for grizzly bear, moose, furbearer, species at risk, and other sensitive habitats, within the areas identified as riparian buffers, recreation areas, caribou habitat, and lakeshore management zones, and throughout the polygon under the biodiversity conservation strategy.

##### 16.3.5.1.2 LAO Objective 33

Apart from existing Wildlife Habitat Areas (WHA), retain security cover adjacent to critical grizzly bear foraging habitats which include salmon and trout spawning reaches or shoals, and herb-dominated avalanche track and run-out zones on southerly and westerly aspects, in very high, high, and moderate capability grizzly bear units as defined by the spatial dataset, Cariboo-Chilcotin Grizzly Bear Capability.

##### 16.3.5.1.3 LAO Objective 34

In very high, high, and moderate capability grizzly bear units as defined by the spatial data set, Cariboo-Chilcotin Grizzly Bear Capability, conduct silvicultural treatments on cutblocks to retain as much existing natural berry production as practicable.

#### 16.3.5.2 Current Practice

1. The FSP holder will ensure that PFA will conform to the strategies in the wildlife general section of the FSP and this document (15.3.1).
2. Before harvesting, in the pre-harvest phase of all cutblocks and roads that are within moderate, high, and very high Grizzly bear capability area, an assessment will be completed within 100 m of

S1, S2 and S3 streams with salmon and trout spawning reaches or shoals, or within 100 m of an herb dominated avalanche track, or within 80m of Critical Fish habitat. The report will include:

- a. a strategy to retain Grizzly security cover within 100m of the stream and limiting stream crossings where practicable.
  - b. a strategy to retain 25 m no harvest reserve zones and a 25 m management zone (50% retention) next to avalanche tracks, limiting road construction within 100 m of avalanche tracks where practicable and the management of access controls on roads within 100 m of avalanche tracks.
  - c. a strategy to retain Grizzly security cover within 80m of critical fish habitat.
3. Prior to conducting any vegetation management treatment within a moderate, high, or very high grizzly bear capability area, a QRP will assess the existing natural berry production. The results of this assessment will guide the vegetation management prescriptions in the area.

There is no WHA for grizzly bears within the overall planning area. However, about 57 percent of the overall planning area is rated as having a moderate, high, or very high grizzly bear habitat capability (Table 15 and Figure 24 below).

*Table 15: Summary of Grizzly Bear Habitat Capacity Area within the Quesnel TSA.*

<b>Grizzly Bear Habitat Capability</b>	<b>Total Area (hectares)</b>	<b>FLP Area (hectares)</b>
<b>Very High</b>	34,489	21,669
<b>High</b>	249,462	170,678
<b>Moderate</b>	895,300	755,585
<b>Low</b>	131,132	117,815
<b>Very Low</b>	74,055	71,443
<b>Nil</b>	67,618	64,075
<b>Total Grizzly Bear Habitat</b>	<b>1,452,055</b>	<b>1,201,266</b>
<b>Not Assessed</b>	627,352	464,504
<b>Total</b>	<b>2,079,407</b>	<b>1,665,770</b>

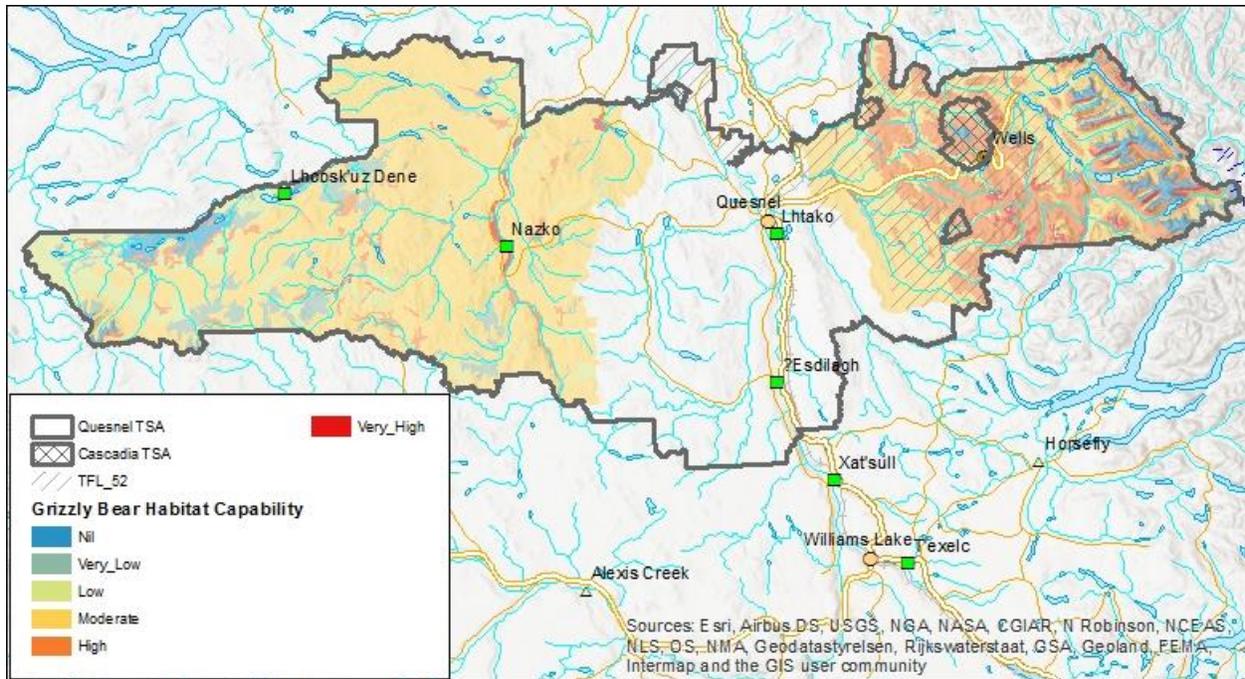


Figure 24: Map of Grizzly Bear Habitat Capability within the Quesnel TSA.

### 16.3.6 American White Pelican

#### 16.3.6.1 Legal Objective

##### 16.3.6.1.1 CCLUP 90 Day Report Appendix 3

To manage for grizzly bear, moose, furbearer, species at risk, and other sensitive habitats, within the areas identified as riparian buffers, recreation areas, caribou habitat, mule deer winter range, and lakeshore management zones, and throughout the polygon under the biodiversity and biodiversity conservation strategy.

#### 16.3.6.2 Current Practice

To maintain American White Pelican habitat across the landscape, the FSP holder will complete an assessment as outline in section 16.3 (wildlife) in this report.

The FSP holder also adopts the results and strategy of the general wildlife measures specified in the White Pelican GAR order that outlines wildlife habitat areas (WHA) for the American White Pelican. The GAR order speaks to the following:

- Access management
  - No new forest service roads or new operation main haul roads within the WHA unless a variance is approved.
  - Timing restrictions for other road use (April 1 to August 31).
- Recreation restrictions
  - No recreational sites within the WHA.
- Silviculture activities
  - No harvesting from April 1 to August 31 unless a variance is approved.

- Timing restrictions (April 1 to August 31) for site preparation, other silviculture work and vehicle use.

There is a total of 5,899 hectares within designated wildlife habitat areas for the American white pelican. Most of this area – or 5,887 hectares – is within the FLP area (see Figure 25).

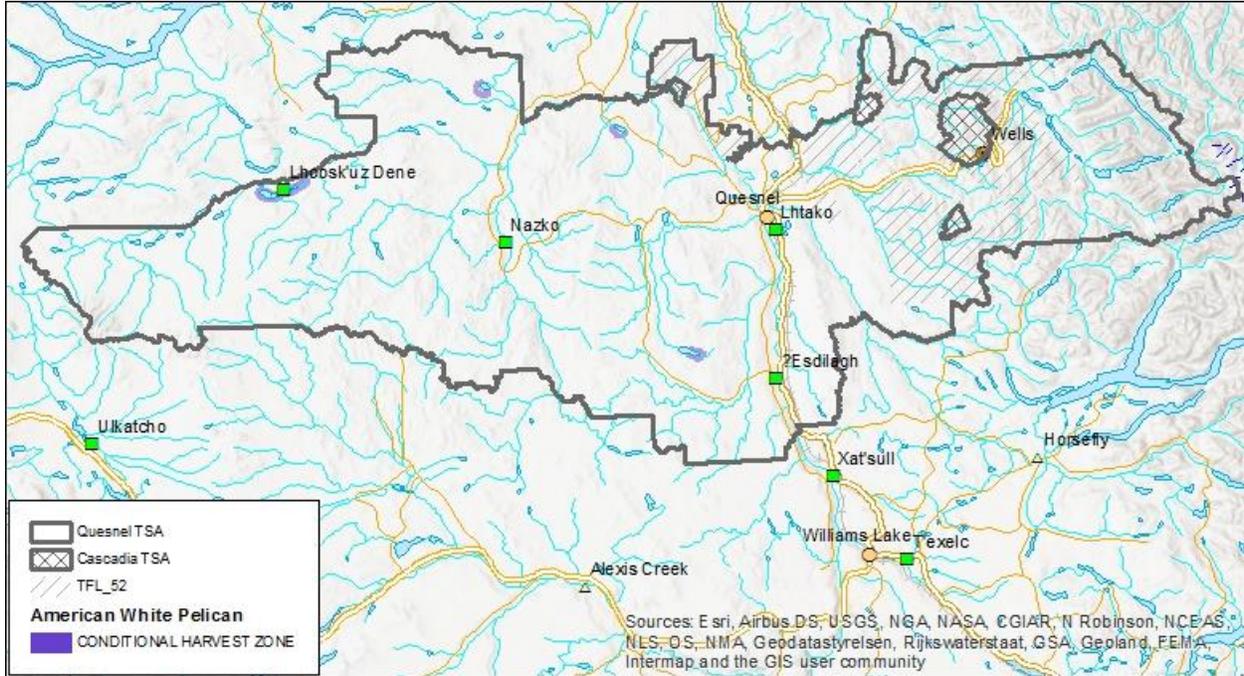


Figure 25: Map of American Pelican Wildlife Habitat Areas within the Quesnel TSA.

### 16.3.7 Blue Heron

#### 16.3.7.1 Legal Objective

##### 16.3.7.1.1 CCLUP 90 Day Report Appendix 3

To manage for grizzly bear, moose, furbearer, species at risk, and other sensitive habitats, within the areas identified as riparian buffers, recreation areas, caribou habitat, mule deer winter range, and lakeshore management zones, and throughout the polygon under the biodiversity and biodiversity conservation strategy.

#### 16.3.7.2 Current Practice

To maintain Blue Heron habitat across the landscape, the FSP holder will complete an assessment as outline in Section 16.3 (wildlife) in this report within 1000 metres surrounding the proposed cutblocks and roads.

The FSP holder also adopts the results and strategy of the general wildlife measures specified in the Blue Heron GAR order that outlines wildlife habitat areas (WHA) for the blue heron.

### 16.3.8 Bull (Dolly Varden) Trout

#### 16.3.8.1 *Legal Objectives*

##### 16.3.8.1.1 CCLUP 90 Day Report Appendix 3

To manage for grizzly bear, moose, furbearer, species at risk, and other sensitive habitats, within the areas identified as riparian buffers, recreation areas, caribou habitat, mule deer winter range, and lakeshore management zones, and throughout the polygon under the biodiversity and biodiversity conservation strategy.

##### 16.3.8.1.2 CCLUP 90 Day Report Pg. 13

Maintain habitat requirements for key regional species, including white pelicans, moose, caribou, mule deer, furbearers and Dolly Varden trout.

##### 16.3.8.1.3 CCLUP 90 Day Report Pgs. 79 & 87

To manage for Dolly Varden habitat by applying modified management regimes over additional riparian buffers in the Niut and South Chilcotin special resource development zone (SRDZ).

#### 16.3.8.2 *Current Practice*

To maintain Bull Trout across the landscape during primary forestry activities, the FSP holder will complete an assessment as outlined in section 15.3.1 (wildlife) within 500 m of proposed cutblocks or roads that are found within 100 m of S1, S2 and S3 streams greater than 2.5 wide and having a stream gradient of <3%.

### 16.3.9 Furbearers (General)

#### 16.3.9.1 *Legal Objectives*

##### 16.3.9.1.1 CCLUP 90 Day Report

To manage for grizzly bear, moose, furbearer, species at risk, and other sensitive habitats, within the areas identified as riparian buffers, recreation areas, caribou habitat, mule deer winter range, and lakeshore management zones, and throughout the polygon under the biodiversity conservation strategy.

##### 16.3.9.1.2 CCLUP Appendix 4 Pg. (s) 156 & 159

“...furbearers such as marten and fisher, waterfowl, and many other species benefit from the application of the guidelines under the FPC and access management...the region contains an abundance of wetlands which provide important habitat for many species. They are of particular importance for waterfowl, moose and furbearers...”

#### 16.3.9.2 *Current Practice*

To maintain furbearer habitat across the landscape, section 15.3.1 (wildlife general) will be followed.

Where 50% of the basal area is removed in a contiguous area greater than 5 ha, a minimum of 1 unburnt debris pile per ha within 100 metres of riparian areas.

## 16.4 Riparian areas and Hydrology

## 16.4.1 Riparian Water, Fish, Wildlife and Biodiversity within Riparian Areas

### 16.4.1.1 Legal Objectives

#### 16.4.1.1.1 FPPR section 8

The objective set by government for water, fish, wildlife and biodiversity within riparian areas is, without unduly reducing the supply of timber from British Columbia’s forests, to conserve, at the landscape level, the water quality, fish habitat, wildlife habitation and biodiversity associated with those riparian areas.

#### 16.4.1.2 Current Practice

1. In order to meet this objective, the FSP will follow results and strategies from 16.4.2 and 16.4.3 (Streams, Wetlands and Lake Riparian Areas).
2. A QRP will determine the riparian edge in a manner consistent with the Riparian Guidebook (1995).

The following table summarizes the area reserved from harvesting to manage for riparian features within the overall planning area. The stream classification data was obtained by the Caribou Natural Resource Region. Wetland and lake classification was derived from the vegetation resource inventory (VRI – Figure 26). The reserve widths were obtained from FSP commitment. This information is presented for strategic purposes and does not replace on-the-ground riparian classification and retention level within riparian management zones.

Table 16: Summary of area reserved from harvesting to be managed for riparian features within the Quesnel TSA.

Description	Class	Total Area (hectares)	FLP area (hectares)
<b>Streams</b>	S1-A	1,820	988
	S1-B	4,322	3,363
	S2	3,449	2,647
	S3	13,217	10,213
	S4/S5	19,439	15,107
	S6	2,402	1,973
<b>Wetlands</b>	Wetlands	92,697	75,280
	W1/W5	20,351	17,114
	W2	1	0
	W3/W4	391	343
<b>Lakes</b>	L1-B	759	677
	L3	84	71
<b>Total</b>		158,932	127,778

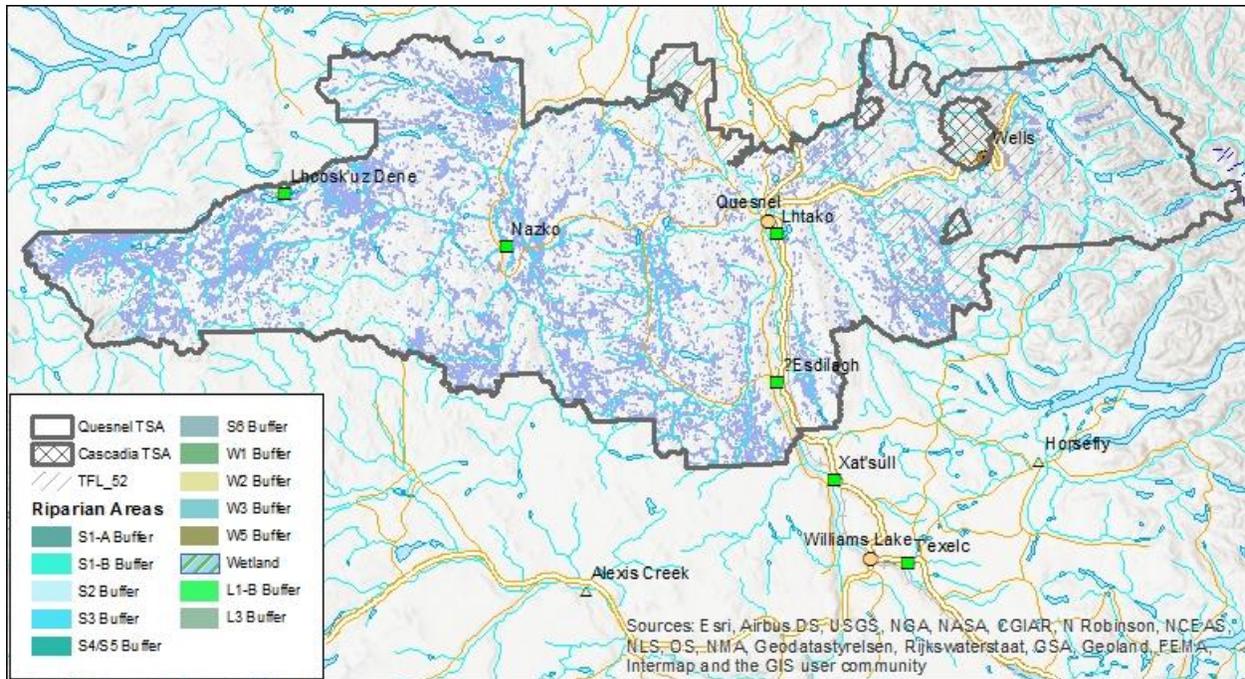


Figure 26: Map of Riparian Buffer Areas including streams, lakes and wetlands, within the Quesnel TSA.

## 16.4.2 Stream, Wetland and Lake Riparian areas Classification and Protection

### 16.4.2.1 Legal Objectives

#### 16.4.2.1.1 LAO Objective 20 (a)

Maintain riparian reserve zones as no harvest areas.

#### 16.4.2.1.2 LAO Objective 20 (b)

Despite objective 20 (a) primary forest activities may be carried out in riparian reserve zones for the following purposes:

1. where harvesting is essential for insect control to curtail severe damage to forest values at the landscape level in a beetle management unit (BMU) classified as suppression for that insect pest,
2. felling or modifying a tree that is a safety hazard, if there is no other practicable option for addressing the safety hazard,
3. constructing a stream crossing,
4. creating a corridor for full suspension yarding,
5. creating guyline tiebacks,
6. felling or modifying a tree under an occupant license to cut, master license to cut or free use permit issued in respect of an area that is subject to a license permit, or other form of tenure issued under the Land Act, Geothermal Resources Act, Mines Act, Mineral Tenure Act, Mining Right of Way Act, Ministry of Lands, Parks and Housing Act or Petroleum and Natural Gas Act, if the felling or modification is for a purpose expressly authorized under that license, permit or tenure,
7. felling or modifying a tree for the purpose of establishing or maintaining an interpretive forest site, recreation site, recreation facility or recreation trail.
8. Within primary and interface fuel breaks, in an approved community or regional wildfire plan, where impacts to primary old seral forest characteristics are minimized:

- a. reduction of fine surface debris, ladder fuels and small diameter trees in intermediate and overtopped crown classes and,
- b. separation of tree crowns among individual trees or clumps within the dominant and codominant layers sufficient to mitigate.

#### 16.4.2.1.3 LAO objective 23

For L3 lakes and selected L1 lakes...defined by the spatial dataset, Cariboo-Chilcotin L3/L1 Lakes, maintain a 10-meter riparian reserve zone.

#### 16.4.2.1.4 CCLUP 90 Day Report Appendix 4(D)

To achieve riparian management area objectives, forest practices within the management zone should:

- Where a riparian management area has both a management zone and a reserve zone:
  - reduce the risk of windthrow to the reserve zone, and
  - retain important wildlife habitat attributes including wildlife trees, large trees, hiding and resting cover, nesting sites, structural diversity, coarse woody debris, and food sources characteristic of natural riparian ecosystems.
- Where a riparian management area has only a management zone:
  - retain sufficient vegetation along streams to provide shade, reduce bank microclimate changes, maintain natural channel, and bank stability and, where specified, maintain important attributes for wildlife, and
  - adjacent to wetlands and lakes, retain key wildlife habitat characteristics of natural riparian ecosystems.

#### 16.4.2.1.5 FPPR Section 8

The objective set by government for water, fish, wildlife and biodiversity within riparian areas is, without unduly reducing the supply of timber from British Columbia's forests, to conserve, at the landscape level, the water quality, fish habitat and biodiversity associated with those riparian areas.

#### 16.4.2.2 Current Practice

This section outlines the riparian classification and protection for streams, wetlands and lakes. The following definitions apply to these sections:

- Riparian reserve zone (RRZ) = no harvesting
- Riparian management zone (RMZ) = modified harvest
- Riparian management areas (RMA) = RRZ and RMZ combined

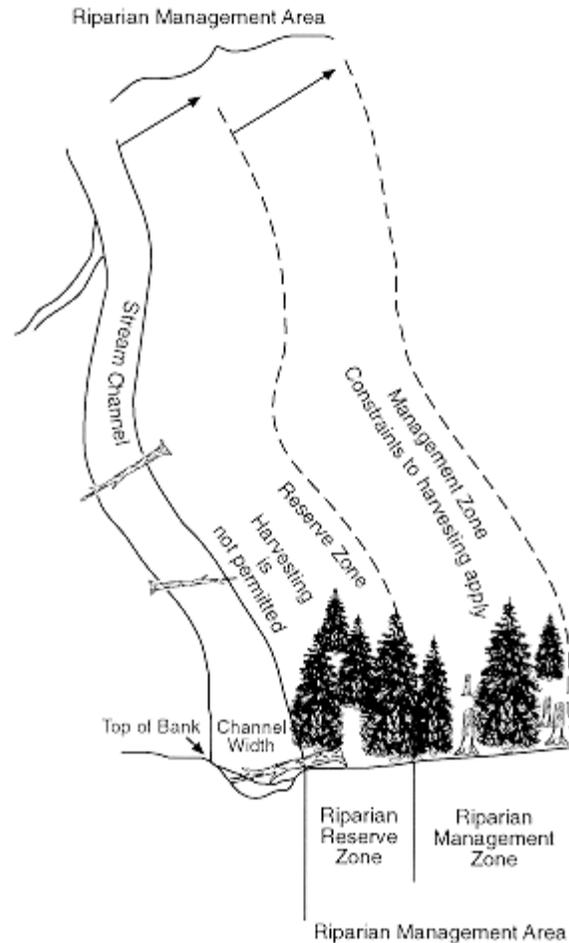


Figure 27. Visual representation of a riparian reserve zone, a riparian management zone and a riparian management area.

#### 16.4.2.2.1 Retention in the Riparian Management Areas

1. Trees will be retained in riparian management zones (RMZ). At the conclusion of harvesting, the FSP holder will not cause the RMZ retention to be less than those specified in the tables below unless:
  - a) The harvesting is conducted for any of the following:
    - i) For the purpose of maintaining a road;
    - ii) Establishing a riparian crossing;
    - iii) To alleviate a safety hazard and there is no other practicable option for alleviating the safety hazard; or
  - b) The harvest system precludes the achievement of the RMZ basal area retention specified in the tables below and there is no practicable harvest system alternative to harvest the cutblock;
  - c) The activity is carrying out management treatments to meet free growing requirements.
2. In addition to clause 1, within riparian reserves zones and riparian management areas on Q1, W3, W4, W5, L3 and L4, the following is retained to the extent practicable within the RMZ:
  - a) Deciduous patches, defined as >0.25 ha containing >80% deciduous species;
  - b) Significant wildlife trees or a minimum of five high value wildlife trees per hectare; and
  - c) Major wildlife features.

3. Significant wildlife trees, high value wildlife trees or deciduous trees retained as a part of this result or strategy that are stubbed for the reasons below, will contribute to meeting the applicable objective when:
  - a) Done as part of a windthrow hazard treatment;
  - b) Done to address a safety hazard, and there is no other practicable option for addressing the safety hazard, and
  - c) The cut portion of the tree identified in a and b is retained on-site.

#### 16.4.2.2.2 Restrictions in a Riparian Reserve Zone (FPPR Section 51)

1. A FSP holder must not cut, modify, or remove trees in a riparian reserve zone, except for the following purposes:
  - a. Felling or modifying a tree that is a safety hazard, if there is no other practicable option for addressing the safety hazard;
  - b. Topping or pruning a tree that is not wind firm;
  - c. Constructing a stream crossing;
  - d. Creating a corridor for full suspension yarding;
  - e. Creating guyline tiebacks;
  - f. Carrying out a sanitation treatment;
  - g. Felling or modifying a tree that has been windthrown or has been damaged by fire, insects, disease or other causes, if the felling or modifying will not have a material adverse impact on the riparian reserve zone;
  - h. Felling or modifying a tree under an occupant license to cut, master license to cut or free use permit issued in respect of an area that is subject to a license, permit, or other form of tenure issued under the *Land Act*, *Coal Act*, *Geothermal Resources Act*, *Mines Act*, *Minerals Tenure Act*, *Mining Right of Way Act*, *Ministry of Lands, Parks and Housing Act* or *Petroleum and Natural Gas Act*, if the felling or modification is for a purpose expressly authorized under that license, permit or tenure;
  - i. Felling or modifying a tree for the purpose of establishing or maintaining an interpretive forest site, recreation site, recreation facility or recreation trail.
2. A FSP holder who fells, tops, prunes, or modifies a tree under subsection (1) may remove the tree only if the removal will not have a material adverse effect on the riparian reserve zone.
3. A FSP holder must not carry out the following silviculture treatments in a riparian reserve zone:
  - a. Grazing or broadcast herbicide applications for the purpose of brushing;
  - b. Mechanized site preparation or broadcast burning for the purpose for site preparation;
  - c. Spacing or thinning

#### 16.4.2.2.3 Road Building in Riparian Management Areas – FPPR Section 50

1. No roads are to be constructed in a riparian management area, unless
  - a. Locating the road outside the riparian management area would create a higher risk of sediment delivery to the stream, wetland, or lake;
  - b. There is no other practicable option for locating the road;
  - c. The road is required as part of a stream crossing.
2. If a road is constructed within a riparian management area, a person must not carry out road maintenance activities beyond the clearing width of the road, except as necessary to maintain the stream crossing.
3. A person must not remove gravel or other fill from within a riparian management area in the process of constructing, maintaining, or deactivating a road, unless

- a. the gravel or fill is within a road prism
- b. the gravel or fill is at a stream crossing, or
- c. there is no other practicable option.

#### 16.4.2.2.4 Additional Riparian Strategies

1. For selected L1 and L3 lakes (defined in the CCLUP), the FSP holder will maintain a 10-meter riparian reserve zone.
2. For those riparian features with a riparian management area, a QRP will complete a windthrow hazard assessment for the riparian management area. If the assessment indicates high or very high risk, a QRP will develop recommendations to mitigate the risk consistent with the *Windthrow Handbook for British Columbia Forests (1994)*.
3. The FSP holder will, for those riparian features requiring a RRZ great than 0m as per FPPR 47(4), 48(3) or 49(2), maintain the RRZ as a no-harvest area except for the following reasons:
  - a. Harvesting is essential for insect control;
  - b. Safety hazards;
  - c. Constructing a stream crossing;
  - d. Creating a corridor for full suspension yarding;
  - e. Creating guyline tiebacks;
  - f. Under other acts
  - g. Recreation and interpretive forest sites
  - h. Harvesting for primary and interface fuel breaks, in an approved community or regional wildfire plan.

#### 16.4.2.2.5 Stream riparian classes and Retention

The following table outlines stream classes, riparian management areas, riparian reserve zones and riparian management zones.

Table 17. Stream classes and association riparian zones.

Riparian Class	Stream Width	Riparian Management Area (m)	Riparian Reserve Zone (m)	Riparian Management Zone (m)	RMZ Basal Area Retention (Min) (%)
<b>S1-A (fish bearing or community watershed)</b>	100 m or greater over 1 km in length	100	0	100	50
<b>S1-B (fish bearing or community watershed)</b>	20m to 100m	70	50	20	50
<b>S2 (fish bearing or community watershed)</b>	5m to 20m	50	30	20	20
<b>S3 (fish bearing or community watershed)</b>	1.5m to 5m	40	20	20	20
<b>S4 (fish bearing or community watershed)</b>	0.5m to 1.5m	30	0	30	30
<b>S4A (fish bearing or community watershed)</b>	Less than 0.5m	10	0	10	30
<b>S5</b>	10m-20m	30	0	30	30
<b>S5A (tributary to a fish stream)</b>	3m to 10m	30	0	30	30
<b>S6T A (tributary to a fish stream)</b>	Less than 3m	20	0	20	25
<b>S6T B (tributary to a fish stream)</b>	Less than 0.5m	20	0	20	25
<b>S6C (Non-tributary to a fish stream)</b>	0.5m to 3m	20	0	20	20
<b>S6D (Non-tributary to a fish stream)</b>	Less than 0.5m	20	0	20	20

#### 16.4.2.2.6 Wetland Riparian Classes and Retention

Table 15 outlines the wetland riparian classes. The wetland riparian classes are based on the area, BEC zone and configuration of the wetlands.

Table 18. Wetland riparian classes and associated riparian areas.

Wetland Class	Area(ha)	Riparian Management Area (m)	Riparian Reserve Zone (m)	Riparian Management Zone (m)	RMZ Basal Area Retention (Min) (%)
<b>W1</b>	>5	50	10	40	20
<b>W2 (IDFxm)</b>	1 to 5	30	10	20	20
<b>W3</b>	1 to 5	30	0	30	20
<b>W4</b>	0.25 to 1	30	0	30	20
<b>W5 (wetland complexes)</b>	>5	50	10	40	20

#### 16.4.2.2.7 Lake Riparian Classes and Retention

Table 16 outlines the lake riparian classes. The lake riparian classes are based on the area and BEC zone configuration of the wetlands.

Table 19. Lake riparian classes and associated riparian areas.

Lake Class	Lake Area (ha)	Riparian Management Area (m)	Riparian Reserve Zone (m)	Riparian Management Zone (m)
<b>L1-A</b>	> 1000	0	0	0
<b>L1-B</b>	5 to 1000	10	10	0
<b>L2</b>	1 to 5 (PP, BG, IDF (very dry hot, very dry warm or very dry mild), CDF, CWH (very dry maritime, dry maritime or dry sub maritime))	30	10	20
<b>L3</b>	1 to 5 (all zones except noted in L2)	30	0	30
<b>L4</b>	0.25 to 1 (PP, BG, IDF (very dry hot, very dry warm or very dry mild))	30	0	30
	0.5 to 1 (CDF, CWH (very dry maritime, dry maritime or dry sub maritime))	30	0	30

### 16.4.3 Lakes with Lakeshore Management Zones and Lakes with Lake Management Class (CCLUP)

#### 16.4.3.1 *Legal Objectives*

##### 16.4.3.1.1 LAO objective 16

“For the lakeshore management zones....defined by the spatial dataset, *Cariboo-Chilcotin Lakeshore Classes*, maintain the lakeshore management zones in accordance with schedule 2.”

##### 16.4.3.1.2 LAO objective 17

“For the lakes...defined by the spatial dataset, *Cariboo-Chilcotin Lake Management Classes*, manage the lakes in accordance with schedule 3.”

##### 16.4.3.1.3 LAO objective 18

Despite Objectives (LAO) 16 and 17, variance from the VQOs and the maximum disturbance limits in schedule 2 and the lake management intent in schedule 3 is permitted in lakeshore management zones for any of the following reasons:

- 1) Where harvesting is essential for insect control to curtail severe damage to forest values at the landscape level in a beetle management unit (BMU) classified as suppression for that insect pest,
- 2) Road and fence construction can occur in Class A lakeshore management classes where there is no other practicable location available,
- 3) Within primary and interface fuel breaks, in an approved community or regional wildfire plan, where impacts to primary old seral forest characteristics are minimized:
  - a) reduction of fine surface debris, ladder fuels and small diameter trees in intermediate and overtopped crown classes and,
  - b) separation of tree crowns among individual trees or clumps within the dominant and codominant layers sufficient to mitigate the spread of a passive crown fire, to a maximum spacing of 6 metres between crowns.

##### 16.4.3.1.4 LAO Objective 19

For refugia and wilderness fisheries lakes, locate new roads away from the lakeshore, sufficient to protect the existing character of the lake, unless no other practicable route exists.

#### 16.4.3.2 *Current Practice*

1. For lakes with established Lake Management Class (defined by the CCLUP), the FSP holder will conduct PFA in the following way:
2. specific to General Lakes with an established lakeshore management zone, achieve the VQO outlines in the table and for lakes without a lakeshore management zone, achieve a VQO of partial retention within 200 m of the lake.
3. specific to Quality lakes, where practicable, locate new roads outside of the lakeshore management zone and achieve the VQO by lakeshore management class.
4. Specific to Refugium lakes: the lakeshore management zone will be a no-harvest area. If there is no lakeshore management zone, the area within 200 m of the lake will be a no-harvest zone.
5. Specific to wilderness Fisheries Lakes, achieve a VQO of preservation within the lakeshore management zone and where practicable, do not construct or upgrade roads within 2km of the lakeshore. If roads are built within 2km from the lakeshore, access controls will be established.
6. There are exemptions for insect control, road, and fence construction in Class A lakeshore management classes when there is no other practicable location and for primary and interface fuel breaks.

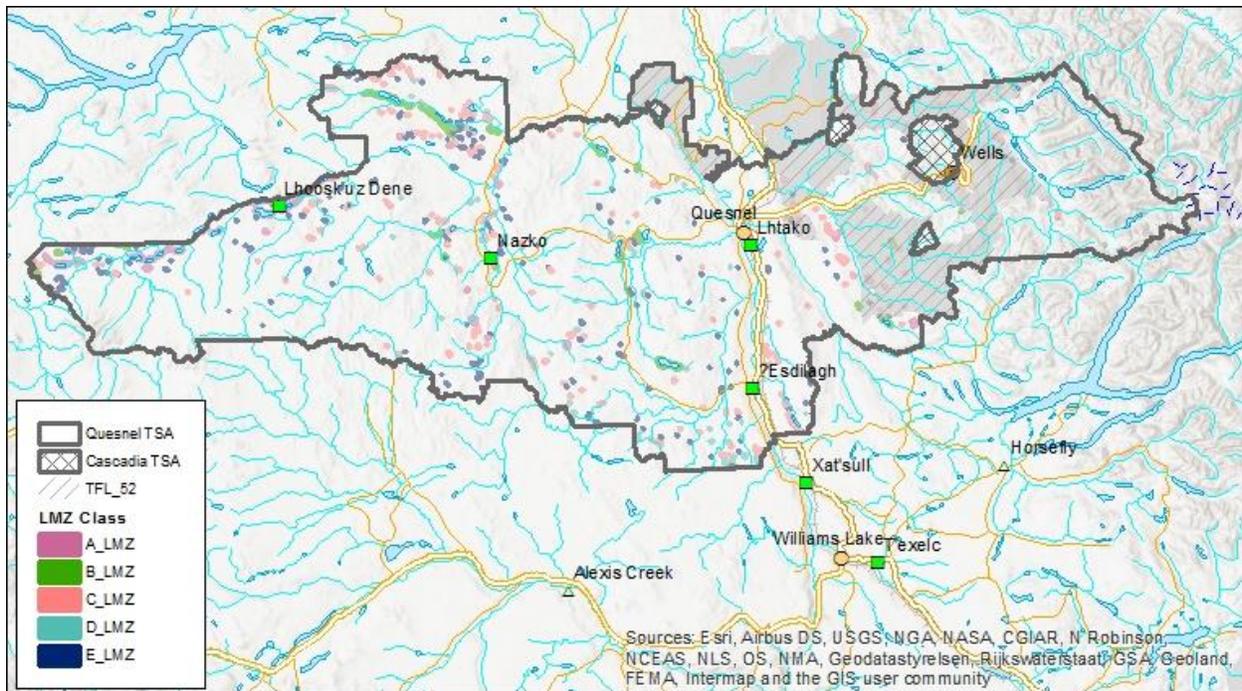
Table 20. Lake management classes (defined by the CCLUP).

<b>General Lake</b>	<b>Manage the area around the lake to maintain a predominantly rural or natural setting. Road access includes 2-wheel drive roads.</b>
<b>Quality Lake</b>	Manage the area around the lake to provide quality natural features with pristine surroundings and a natural appearing environment. Minimize road access and land development.
<b>Refugium Lake</b>	Manage the area around the lake to conserve the special ecological or physiographic features or habitats.
<b>Wilderness Fisheries Lake</b>	Manage the area surrounding the lake to maintain natural features in an undisturbed, wilderness setting.

Table 21. Lakeshore management zone objectives by visual quality objective in the lakeshore management zone.

Lakeshore Management Classes	VQO in the LMZ	Forest Disturbance and Retention in the LMZ	
		Partial Cutting	Clearcutting
<b>All</b>		Conserve deciduous patches, significant wildlife trees, major wildlife features, and moist under-story habitats	
<b>A</b>	Preservation	No harvest	
<b>B</b>	Retention	Max forest disturbed area is 20% of the LMZ every 20 year with min basal area retention of 50%.	Max forest disturbed area is 10% of the LMZ every 20 year with openings smaller than 5 ha.
<b>C</b>	Partial Retention	Max forest disturbed area is 40% of the LMZ every 20 years with min basal area retention of 50%.	Max forest disturbed area is 20% of the LMZ every 20 years with openings smaller than 10 ha.
<b>D</b>	Modification	Max forest disturbed area is 60% of the LMZ every 20 years with min basal area retention of 50%.	Max forest disturbed area is 30% of the LMZ every 20 years.
<b>E</b>	Modification	Max forest disturbed area is 100% of the LMZ every 20 years with min basal area retention in the LMZ of 50%.	Max forest disturbed area is 50% of the LMZ every 20 years.

The map below shows the location of the identified lakeshore management classes:



#### 16.4.4 Watershed Hydrology – Hydrologic Stability

##### 16.4.4.1 Legal Objectives

###### 16.4.4.1.1 CCLUP 90 Day Report pg. 160

As required under the forest practices code when disturbance levels exceed 25% and in key watersheds, a watershed assessment should be undertaken to ensure the maintenance of critical fish and wildlife habitats and hydrological stability.

###### 16.4.4.1.2 CCLUP 90 Day Report pgs. 61, 83 and 113

- Boss/Deception SRDZ -To manage the Horseshy River watershed for hydrologic stability through watershed assessment, restoration work and monitoring programs.
- Cottonwood ERDZ -To manage the Cariboo and Cottonwood River watersheds for hydrologic stability through watershed assessment, restoration work and monitoring programs.
- Quesnel Highlands SRDZ -To manage the Cariboo River watershed for hydrologic stability through watershed assessment, restoration work and monitoring programs.

##### 16.4.4.2 Current Practice

1. Prior to carrying out or authorizing primary forest activities within key watersheds (Cariboo River and Cottonwood River), the FSP holder will conduct a hydrological assessment when the ECA is greater than or equal to 25%. The FSP holder will ensure that the cutblock or road site plan is consistent with the recommendations within the hydrological assessment.
2. Ensure all newly constructed roads (<1 year old), or fish stream crossings, or roads under responsibility of the FSP Holder exhibiting signs of terrain instability within key watersheds are inspected post freshet for erosion, slope failures, stream crossings and any signs of instability and for permanent roads, assign an inspection frequency based on risk.
3. If any concerns or issues are identified, a remediation plan will be created and implemented.

Figure 29 outlines where the key watersheds within the QFLP are located.

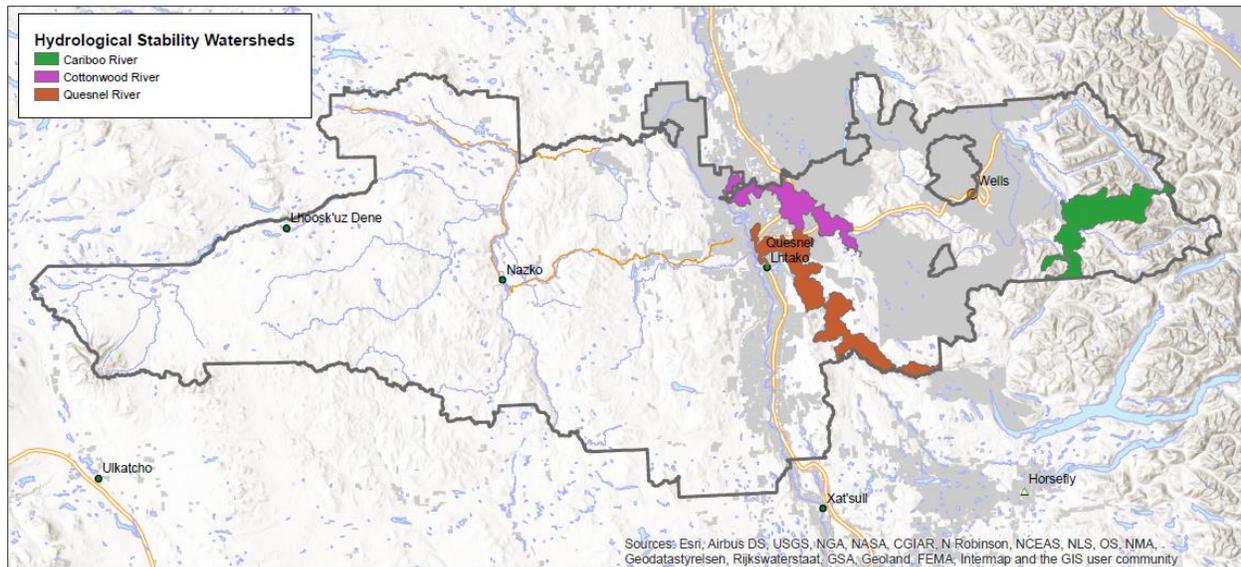


Figure 28. Map of the key watersheds within the QFLP related to the watershed hydrology strategy.

#### 16.4.5 Critical Fish Habitat

##### 16.4.5.1 Legal Objectives

###### 16.4.5.1.1 LAO Objective 12

Maintain critical habitat for fish as defined by the spatial dataset, Cariboo-Chilcotin Critical Habitat for Fish as no-harvest areas.

###### 16.4.5.1.2 LAO Objective 13

Despite Objective 12, primary forest activities are permitted in areas classified as critical habitat for fish for the following reasons:

1. Where harvesting is essential for insect control to curtail severe damage to forest values at the landscape level in a beetle management unit (BMU) classified as suppression for that insect pest,
2. Road and fence construction where there is no other practicable location available.

###### 16.4.5.2 Current Practice

The FSP holder will maintain critical habitat for fish, as defined in the CCLUP Act Order by the spatial dataset as no harvest areas except in the following situations where PFA are permitted:

1. Insect control;
2. Road or fence construction where there is no other practicable location;
3. Primary and interface fuel breaks

There are currently 16,714 hectares of critical fish habitat with no harvest zones within the overall planning area, including 7,607 hectares within the FLP area. There has been no harvesting within the critical fish habitat areas since they were created. Figure 22 indicates the critical fish habitat areas throughout the TSA.

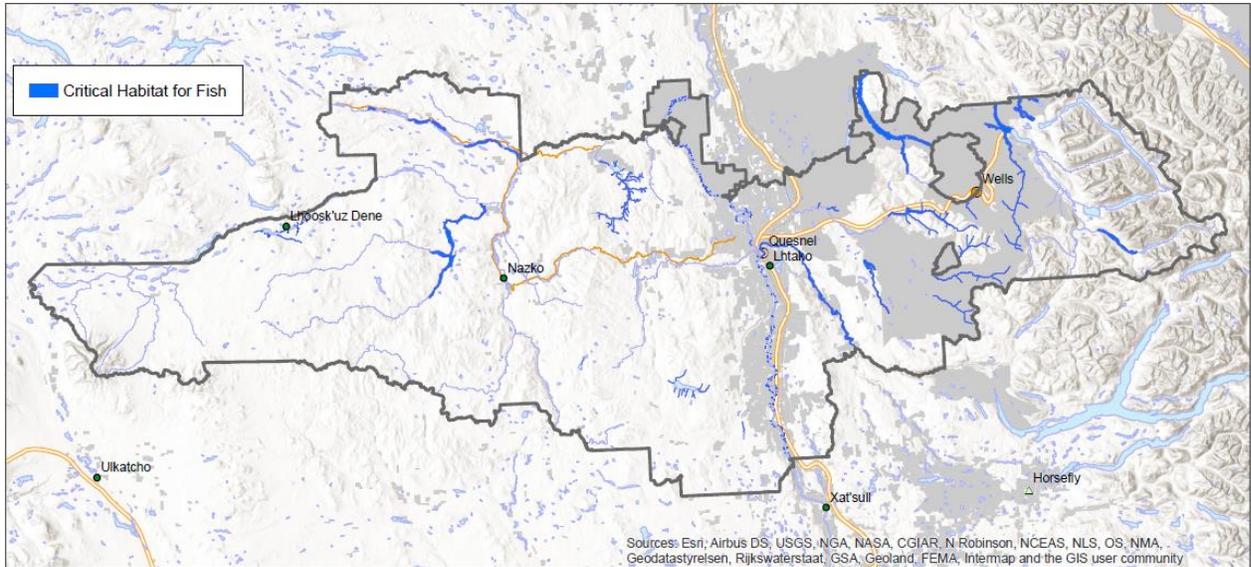


Figure 29. Critical fish habitat areas throughout the Quesnel TSA.

## 16.4.6 Blackwater Quality Fisheries Resource

### 16.4.6.1 Legal Reference

#### 16.4.6.1.1 CCLUP 90 Day Report pgs. 71 & 91

- Lower Blackwater SRDZ – To manage the Blackwater River as a quality fisheries resource through riparian buffers and modified management over 12% of the forest area.
- Upper Blackwater SRDZ – To manage the Blackwater River as a quality wilderness stream fishery.

### 16.4.6.2 Current Practice

To manage the Blackwater Quality Fisheries Resource, the FSP holder will follow sections 16.4 Riparian areas, 16.6 Visual Quality, and 16.7 Recreation. Through these other strategies, the riparian buffers and modified management will be measured.

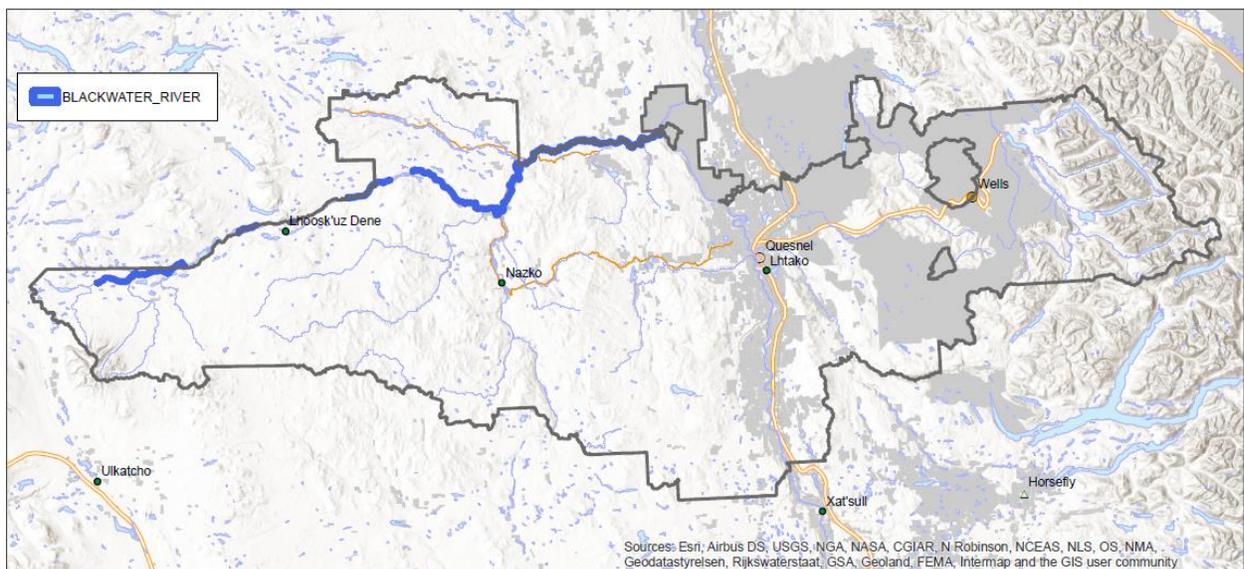


Figure 30. The Blackwater River flows through the north section of the Quesnel TSA.

## 16.4.7 Salmon Watersheds

### 16.4.7.1 *Legal Objective*

#### 16.4.7.1.1 CCLUP 90 Day Report

- Baezaeko ERDZ - To manage the Baezaeko River watershed for salmon stocks through application of the Forest Practices Code. (pg. 107)
- Beaver Valley ERDZ - To manage the Horsefly, Beaver, Hazeltine and Edney River watersheds for salmon stocks, through riparian area protection and controls on the rate of harvest. (pg. 115)
- Cottonwood ERDZ - To manage the Cottonwood River watershed for salmon stocks, through riparian area protection and controls on the rate of harvest. (pg. 113)
- Itcha-Ilgachuz SRDZ - To manage the Dean and Baezaeko River watersheds for salmon stocks through riparian area protection and controls on the rate of harvest. (pg. 71)
- Nazko ERDZ – To manage the Nazko River watershed for salmon stocks through application of the Forest Practices Code. (pg. 109)
- Quesnel ERDZ - To manage the Quesnel River watershed for salmon stocks through riparian area protection and controls on rate of harvest. (pg. 111)
- Quesnel Highlands SRDZ - To manage the Cariboo, Bowron and Cottonwood River watershed for salmon stocks, through riparian area protection and controls on the rate of harvest. (pg. 83)
- Quesnel Lakes SRDZ - To manage the Quesnel, Bowron and Horsefly River watersheds for salmon stocks, through riparian area protection and controls on the rate of harvest. (pg. 85)

### 16.4.7.2 *Current Practice*

1. To manage for the rate of harvest and riparian protection in the rivers and watersheds of the Horsefly, Chilcotin, Chilko, Taseko, Atnarko, Baker, Bowron, Cariboo, Cottonwood, Quesnel, Nazko, Beaver, Hazeltine, Edney, Baezaeko and Dean Rivers, the FSP holder will conform to the strategies in Sections:
  - 15.3.4 Riparian areas
  - 15.4.4 Watershed hydrology
  - 15.4.5 Critical Fish Habitat
  - 15.4.8 Water in Community Watersheds and Licensed Waterworks
  - 15.5 Biodiversity
  - 15.6 Visual Quality
  - 15.7.6 Wildcraft
2. Within 500 m (slope distance) of the main stem of the Fraser River the FSP holder will not construct new roads or upgrade existing roads on areas defined as Terrain Class III, IV, or V unless a QRP completes a Terrain Stability Assessment and the primary forest activities are consistent with the assessment.

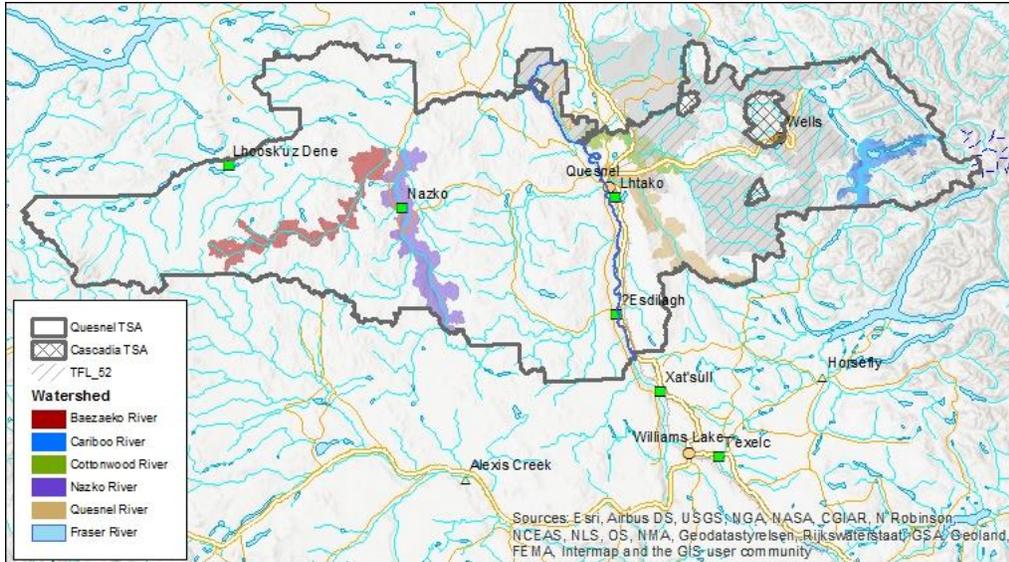


Figure 31. Location of salmon watersheds within the Quesnel TSA.

## 16.4.8 Water in Community Watersheds & Licensed Waterworks

### 16.4.8.1 Legal Objectives

#### 16.4.8.1.1 FPPR 8.2

The objective set by government for water being diverted for human consumption through a licensed waterworks in a community watershed is to prevent to the extent described in subsection (3) the cumulative hydrological effects of primary forest activities within the community watershed from resulting in:

1. a material adverse impact on the quantity of water or the timing of the flow of the water to the waterworks, or
2. the water from the waterworks having a material adverse impact on human health that cannot be 53 addressed by water treatment required under:
  - i. an enactment, or
  - ii. the license pertaining to the waterworks.

#### 16.4.8.2 Current Practice

1. Within a community watershed, the FSP holder will meet the objectives by adopting FPPR Section 59 (Protecting Water Quality), Section 60 (Licensed Waterworks), Section 61 (Excavated or Bladed Trails), Section 62 (roads in a Community Watershed), Section 63 (Use of Fertilizers) and Section 84 (Notice – Road in community watershed).
2. If a Community Watershed Assessment (CWA) has not been completed in the last 5 years, a CWA will be completed by a QRP prior to harvesting or road building.
3. The FSP holder will ensure that the PFA are conducted consistent with the recommendations contained within the assessment completed by the QRP.
4. Prior to the start of PFA, the FSP holder will notify the TSL holder that the proposed development is within 100m of a licensed waterwork (BCTS only).

There is one designated community watershed within the overall planning area. The Troll community watershed is 8 hectares in size.

Water licenses are issued under the Water Sustainability Act for diverting water from the province of BC. The water can be diverted from surface water sources such as lakes and rivers with Points of Diversion (PODs), groundwater sources such as aquifers can be diverted by Points of Well Diversion locations of points of well diversion (PWD) or non-well points of groundwater diversion (PGs) such as dugouts, ditches and quarries.

In the overall planning area, there are a total of 864 unique points of diversion associated with 1324 water licenses. The majority of the water licenses - 433 licenses- are for domestic purposes, including drinking water (64 licenses).

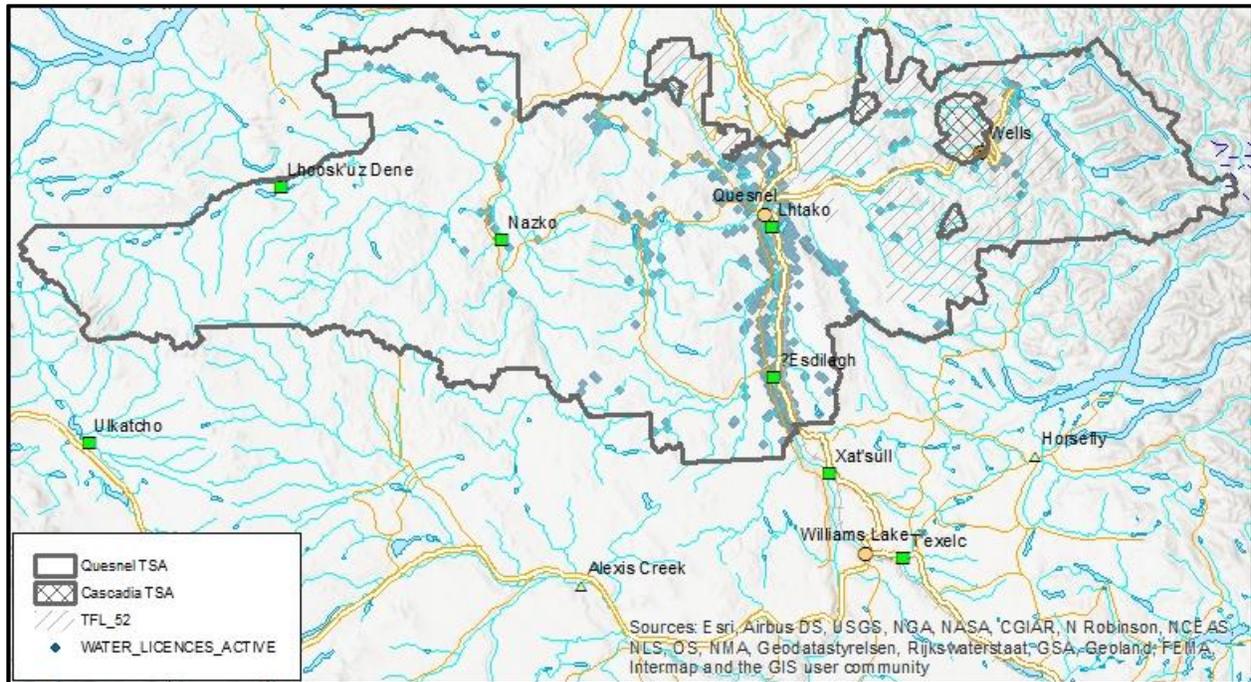


Figure 32: Map of the water licenses within the Quesnel TSA.

## 16.5 Biodiversity

### 16.5.1 Seral Stage

#### 16.5.1.1 Legal Objective

##### 16.5.1.1.1 FRPA Sec. 9

The objective set by government for biodiversity at the landscape level is, without unduly reducing the supply of timber from British Columbia's forests to design areas on which timber harvesting is to be carried out that resemble, both spatially and temporally, the patterns of natural disturbance that occur within the landscape.

##### 16.5.1.1.2 LAO objective 5

Maintain biodiversity in accordance with the landscape units and biodiversity emphasis as defined by the spatial dataset, Cariboo-Chilcotin Landscape Units.

### 16.5.1.1.3 CCLUP 90 Day Report

To manage for Mature plus Old Seral Stage targets according to the targets and seral stage definitions in Table 7 of the Biodiversity Conservation Strategy (1996) for the Cariboo-Chilcotin Land-Use Plan.

#### 16.5.1.2 Current Practice

The FSP holder will not conduct harvest of mature seral or older forest in a M+O deficit unit, or cause the amount of mature seral or older forest in a seral assessment unit to be less than the applicable M+O seral target area outlined in Table 19, except for the following reasons:

1. Specific salvage harvestings (cannot go below the old seral target threshold and sufficient mature recruitment area has been identified as no-harvest);
2. Partial cut systems;
3. Primary and interface fuel breaks; or
4. Harvesting that is essential for insect control.

Table 22. Mature plus Old Seral Stage targets.

NDT	BEC Zone	Seral Stage Age Definition (years)	Target minimum % of total productive forest area in seral assessment unit		
			Low BEO	Intermediate BEO	High BEO
			Mature + Old min.	Mature + Old min.	Mature + Old min.
1	ESSF	>120	19	36	54
1	ICH	>100	17	34	51
1	MH	>120	19	36	54
2	CWH	>80	17	34	51
2	ESSF	>120	14	28	42
2	ICH	>100	15	31	46
2	SBS	>100	15	31	46
3	ESSF	>120	14	23	34
3	MS	>100	14	26	39
3	SBPS	>100	8	17	25
3	SBS	>100	11	23	34
3	ICH	>100	14	23	34
4	IDF – Fir group	>100	22	43	65
4	IDF – Pine group	>100	11	23	34

The amount of mature and old forest in most seral assessment units within the FLP area exceeds the required minimum amount. As shown in the map below, the amount of mature and old seral forest in seral assessment units within the Baker, Pantage, Pelican, Snaking, Twan, Umiti and Victoria landscape units is below the CCLUP target (data can be found in Appendix 2).

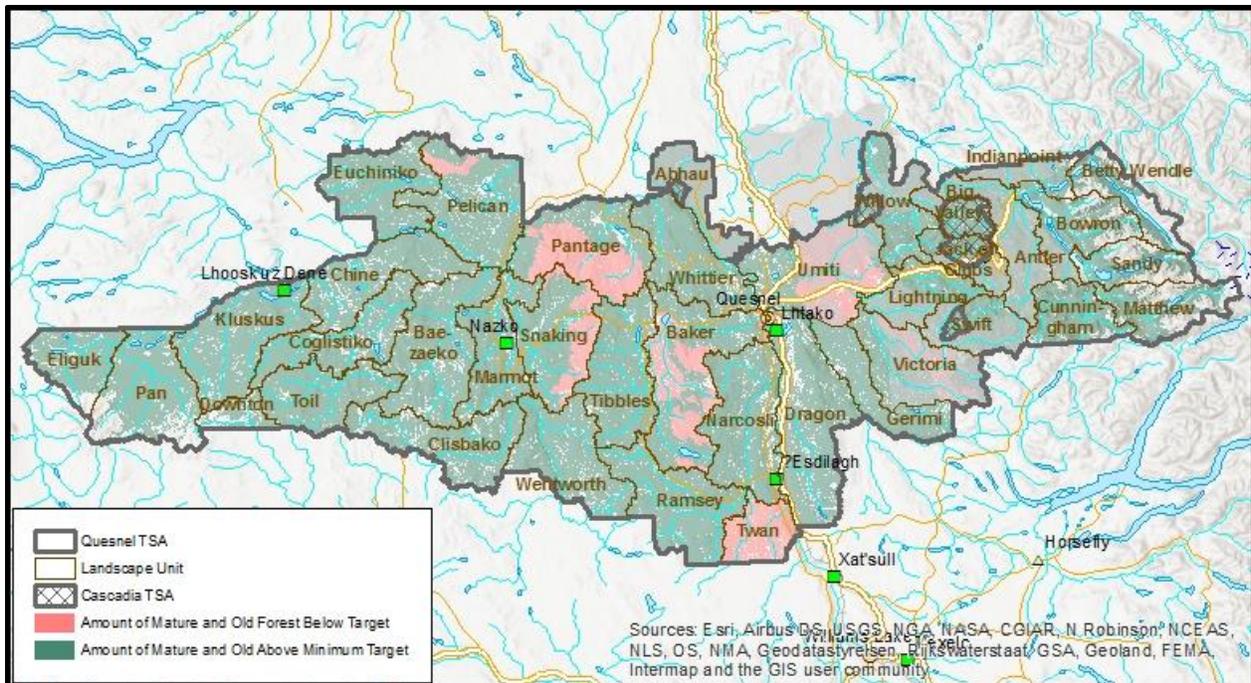


Figure 33: Amount of Mature and Old Forests above and below minimum targets within the Quesnel TSA.

## 16.5.2 Spatial/Temporal Distribution of Cutblocks, Landscape Connectivity and Species Composition

### 16.5.2.1 Legal Objectives

#### 16.5.2.1.1 FPPR Sec. 9

The objective set by government for biodiversity at the landscape level is, without unduly reducing the supply of timber from British Columbia’s forests to design areas on which timber harvesting is to be carried out that resemble, both spatially and temporally, the patterns of natural disturbance that occur within the landscape.

#### 16.5.2.1.2 CCLUP 90 Day Report

“Conserve biological diversity through ... objectives for ... landscape connectivity ... species composition, temporal distribution of cutblocks ... These targets will be applied at the Landscape Unit Level ... [and] will be based on the Biodiversity Conservation Guidelines [aka Biodiversity Guidebook published September 1995] ... Application of these guidelines in all zones and polygons is required ... Consistent with the targets, maintenance of deciduous (Aspen) and spruce components are important considerations the Chilcotin Plateau.”

#### 16.5.2.1.3 CCLUP 90 Day Report Appendix 3

To manage for grizzly bear, ... and other sensitive habitats within the areas identified as riparian buffers, ... and throughout the polygon under the biodiversity conservation strategy, including key leading spruce stands [or] including key leading deciduous stands [or] including key aspen stands.

### 16.5.2.2 Current Practice

1. The FSP holder will conduct a patch size assessment that demonstrates how the proposed harvest will either maintain or trend the patch size distribution consistent with the patch size target ranges found in Table 20.

Table 23. Patch size class and target range.

Patch Size Class (target % range in each class)						
NDT	BEC unit	0-40ha	41-80ha	80-250ha	40-250ha	>250ha
1	all	30-40	30-40	20-40	n/a	0
2	all	30-40	30-40	20-40	n/a	0
3 Douglas Fir throughout	SBSdw, SBSmh, SBSmw, ICHdk	20-30	25-40	30-50	n/a	0
3 Douglas Fir restricted or absent	all others	10-20	n/a	n/a	10-20	60-80
4	all	30-40	30-40	20-30	n/a	0

2. To the extent practicable, the proposed harvest must not cause the patch size distribution of the resulting seral stage(s) in a patch assessment unit to be inconsistent with, or deviate further from, the patch size target ranges outline in the FSPs, unless the exemptions in the seral stage strategy are met or the harvest trends towards the desired patch size targets.
3. The FSP holder will conduct an assessment that demonstrates how the design of stand level retention has maintained the natural connectivity characteristics of mature and old forests.
4. The FSP holder will, when designing harvest proposals that include areas of key leading spruce, deciduous or aspen stands demonstrate in the site plan how these stands were considered in the design of WTRAs.

### 16.5.3 Old Growth Management Areas

#### 16.5.3.1 Legal Objective

##### 16.5.3.1.1 LAO objectives 8, 9, 10 & 11

Maintain as no-harvest areas the Permanent OGMA-static, Permanent OGMA-rotating, and Transition OGMAs as defined by the spatial dataset: Cariboo-Chilcotin Old Growth Management Areas.

#### 16.5.3.2 Current Practice

In transition OGMA, where conifer mortality >50% of stand basal area, and equivalent old seral forest exists in locations contributing to the permanent OGMA target in the same LU-BEC unit.

The FSP holder will not conduct PFA in permanent OGMA-static, permanent OGMA-rotating, or transition OGMA, unless:

1. Harvesting incursion of 10 ha, or less, that better align the OGMA boundaries with intended geographic features where the OGMA boundaries were clearly intended to follow a geographic feature;

2. Where harvest is essential for insect control, and all known infestation sites on provincial forest land within 500 m of the infested OGMA are addressed before or in conjunction with entries into the OGMA;
3. Road or fence construction where no other practicable location is available;
4. Thinning from below to enhance old seral stand attributes in OGMAs located within designated MDWR in the shallow and moderate snowpack zones;
5. Within primary and interface fuel breaks, in an approved community or regional wildfire plan, where impacts to primary old seral forest characteristics are minimized;
6. Guy line tiebacks and no other practicable location is available;
7. In permanent OGMA-rotating, where mature conifer mortality is >50% by basal area for trees >17.5 cm DBH or stand age is >200 years and the stand is >70% lodgepole pine by basal area for trees >17.5 cm DBH

Within the overall planning area, 13 percent of the forested area – or 239,096 hectares – is old. Of this old area, 31,609 hectares is within OGMAs. To allow for old forest recruitment and manage for other values, an additional 114,788 hectares is within OGMAs, for a total area of 146,397 hectares. As seen in the table below, the majority of OGMAs – or 113,808 hectares – are within the FLP area.

*Table 24: Summary of Old Growth Management Areas and Old Forests Areas within the Quesnel TSA.*

<b>OGMA Type</b>	<b>Area (hectares)</b>	<b>Forested Area (hectares)</b>	<b>Old Forest Area (Hectares)</b>	<b>Percent OGMA old (%)</b>	<b>Percent of Total Old Forest in OGMA (%)</b>
<b>Permanent</b>	90,340	87,849	20,757	24%	10%
<b>Transition</b>	23,467	22,954	4,292	19%	2%
<b>Total FLP</b>	<b>113,808</b>	<b>110,803</b>	<b>25,049</b>	<b>23%</b>	<b>11%</b>
<b>Other</b>	32,589	31,465	6,560	21%	28%
<b>Non-Forested</b>		4129			
<b>Total Area</b>	<b>146,397</b>	<b>146,397</b>	<b>31,609</b>	<b>22%</b>	<b>13%</b>

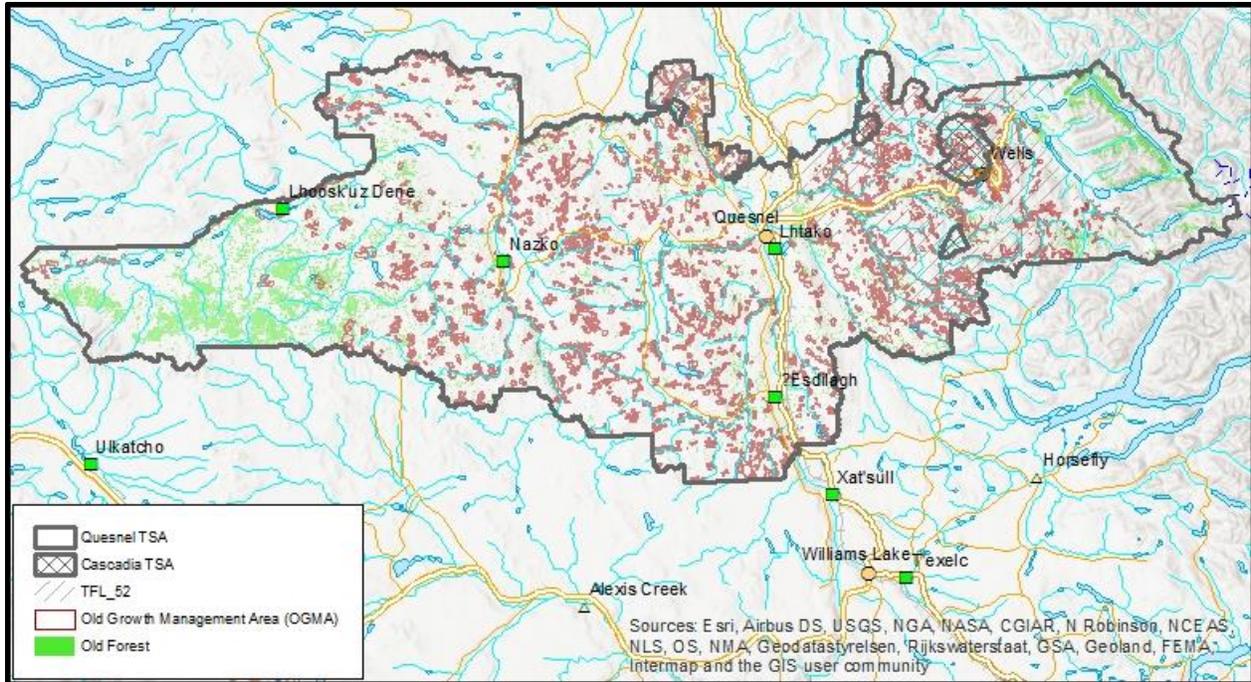


Figure 34: Map of the Old Growth Management Areas as well as Old Forests within the Quesnel TSA.

About 22 percent of the total OGMA area – or 32,241 hectares – overlaps areas of importance for other values. This includes values such as wildlife habitat, high value wetlands for moose.

#### 16.5.4 Cariboo – Chilcotin Grassland Benchmark Area

##### 16.5.4.1 Legal Objective

###### 16.5.4.1.1 CCLUP 90 Day Report

“... To manage in conjunction with protected areas to maintain or enhance key grassland habitats and to maintain regionally significant Becher Prairie pothole habitat values ....”

###### 16.5.4.1.2 LAO objective 25

To implement silviculture practices that facilitate restoration or open grassland condition....

##### 16.5.4.2 Current Practice

1. Within grassland benchmark areas the FSP holder will not:
  - a. authorize or conduct the construction of roads, secondary roads, trails or landings unless no other practicable alternative exists for accessing and/or extracting timber, or
  - b. apply herbicide treatments, or
  - c. conduct reforestation activities.
2. Within grassland benchmark areas, the FSP holder will ensure:
  - a. all primary forest activities are limited to frozen ground conditions, unless no other practicable alternative exists for access and/or extracting timber; and
  - b. all primary forest activities will not exceed 5% soil disturbance; and
  - c. processing and decking of timber are done outside the grassland benchmark areas where practicable; and rehabilitation of all roads not required for long term access, secondary roads and landings by re-contouring and grass seeding with ecologically suitable species for the site following harvest and before the next winter season.

3. The FSP holder will ensure for those portions of cutblocks authorized within the grassland benchmark areas, at the conclusion of harvesting:
  - a. retention of all conifer stems > 65cm dbh except for the following:
    - i. stems containing active bark beetle and are located within a suppression BMU for that insect pest, or
    - ii. felling or modifying a tree that is a safety hazard, if there is no other practicable option for addressing the safety hazard.
  - b. for each stem >65cm DBH retained, retention of 1 to 4 conifer stems > 12.5cm DBH targeting stems adjacent to the stems > 65cm DBH retained; and
  - c. retention of all deciduous stems where practicable.
4. The FSP holder will apply Appendix G Stocking Standards Sec. Variation from Stocking Standards Clause 9 Grassland Benchmark for portions of cutblocks that fall within Grassland Benchmark Area (GBA).
5. GBA spatial adjustments are allowed that align to the intended historical location of the grassland benchmark area boundaries, based on the recommendations of a QRP and in consultation with appropriate FLNRORD staff.

There is a total of 4,222 hectares identified as grassland benchmark area. Most of this area is located in the south-west part of the FLP area and along the Euchiniko River (Figure 35).

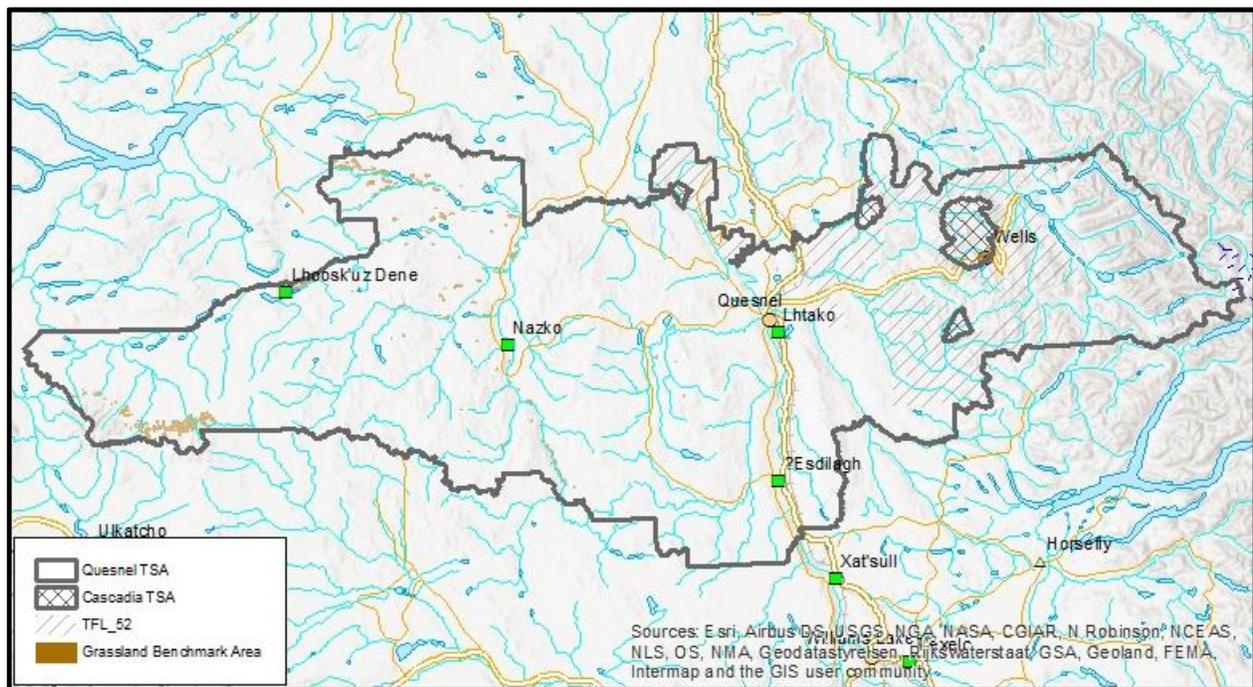


Figure 35: Map of the Grassland Benchmark Areas within the Quesnel TSA.

## 16.5.5 Mature Birch Retention

### 16.5.5.1 Legal Objective

#### 16.5.5.1.1 LAO objective 24

Maintain at least 40 percent of the existing, mature birch to allow for First Nations cultural use within cutblocks in the areas of Beaver Valley, Polley, Lower Cariboo, and Cariboo Lake landscape units as defined by the spatial dataset, Cariboo-Chilcotin Birch Areas for First Nations.

### 16.5.5.2 Current Practice

Within Cariboo Chilcotin Birch Areas inside the Dragon and Gerimi landscape units, the FSP holder will ensure, after harvest, that the amount of mature birch existing before harvest is not reduced below 40 percent of the existing basal area/ha, to the extent practicable, within the gross area of each TSL.

There are 977 hectares of mature birch retention area within the Quesnel FLP (Figure 36).

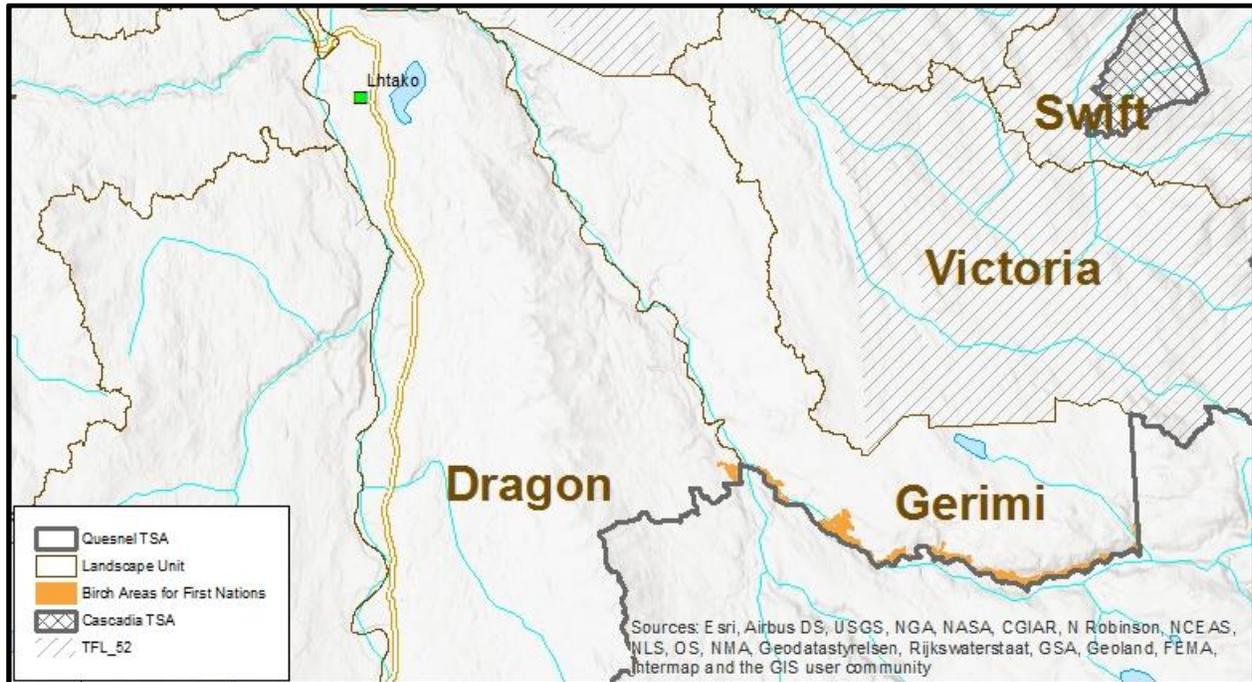


Figure 36: Map of the mature birch areas within the Quesnel TSA.

## 16.5.6 Wildlife and Biodiversity – Stand Level

### 16.5.6.1 Legal Objectives

#### 16.5.6.1.1 LAO Objective 6

Where harvesting removes >50 percent of the pre-harvest stand basal area or where the harvest is part of a shelterwood silvicultural system, meet or exceed the minimum areas for wildlife tree retention for each harvest area (cutblock or cutting permit) as set out in Schedule 1 Wildlife Tree Retention Targets.

#### 16.5.6.1.2 LAO Objective 7

Where practicable, in partially cut stands, where harvesting removes less than 50 percent of the pre-harvest basal area, retain high-value, wildlife trees up to the limits in Schedule 1 Wildlife Tree Retention Targets.

### 16.5.6.2 Current Practice

1. Where harvesting removes >50% of pre-harvest merchantable stand basal area or is part of a shelterwood silvicultural system, the FSP holder will ensure upon the conclusion of harvesting:
  - a. the minimum areas for wildlife tree retention have been met as set out in Appendix A;
  - b. wildlife tree retention areas will be located in priority areas (outlined in FSP)

2. Where harvesting removes <50% of pre-harvest merchantable stand basal area, the FSP holder will ensure, to the extent practicable, that high value wildlife trees are retained up to the targets specific in Appendix D by LU\_BEC Unit.
3. Individual stems reserved from harvest within the harvest area can contribute to the wildlife tree retention area target on a basal area or volume equivalency basis.
4. The FSP holder will ensure that wildlife tree retention areas (WTRA) associated with each cutblock are restricted from harvesting until they develop attributes that are consistent with a mature seral condition, except for the following circumstances:
  - a. Safety concerns if there are no other practicable alternatives.
  - b. Harvesting for primary and interface fuel breaks and impacts to old seral forest characteristics are minimized.
  - c. Harvesting essential for insect control and all identified infestation sites on crown provincial forest land within 500 m of the invested WTRAs are already addressed.
  - d. To facilitate road construction or address operational constraints to cable yarding.
  - e. To facilitate harvesting of a cutblock for tail holds, guy line tiebacks, designated skid trails or yarding corridors.
  - f. Where the WTRA is damaged as a result of wind, fire or forest health factors and, in the opinion of a QRP, the WTRA is rendered ineffective.
5. Despite Clause 1, the FSP holder, upon the conclusion of harvesting, will have increased the minimum target percentage for the LU-BEC wildlife tree retention to a percent consistent with the table (outlined in the FSPs) or greater where the TSL or CP has all the following three attributes:
  - a. West of the Fraser River; and
  - b. within mature+old seral deficit landscape units; and
  - c. within either the SBPS, MS, or SBS Biogeoclimatic Zones.
  - d. The increased percentage above the LU\_BEC target is to be established as short-term reserve, not WTRA.
6. Areas that have been set aside under the Chief Forester's Guidance on Landscape and Stand-level Structural Retention in Large-Scale Mountain Pine Beetle Salvage Operations and identified as WTRA or reserves in RESULTS, or under the Quesnel District Guidance for Conservation Legacy Areas, will continue to be protected until the conditions described in the guidance are met.
7. Where the FSP holder conducts harvest within a wildlife tree retention area and,
  - a. the harvesting results in the WTRA dropping below the targets specified for the TSL or CP in Appendix D, the FSP holder will:
    - i. ensure that a suitable replacement area of equal size is re-established, and
    - ii. the replacement area will be the closest available location consistent with the priorities and design factor for locating WTRA in clause 1 b; and
    - iii. the replacement area will be a minimum of 0.25 ha in size and;
    - iv. the change will be reported in RESULTS by May 1 of the following year; or
  - b. the harvesting does not cause the wildlife tree retention area to drop below the targets specified in Appendix D for the TSL or CP the FSP holder will:
    - i. report the change in RESULTS by May 1 of the following year.

On average, 12% of the total cutblock area is retained to address stand-level biodiversity requirements.

## 16.6 Visual Quality

### 16.6.1 Legal Objective

#### 16.6.1.1 LAO Objective 26

Maintain the visual quality objectives for scenic areas as defined by the spatial dataset, Cariboo-Chilcotin Scenic Areas.

#### 16.6.1.2 LAO Objective 27

Despite Objective 26, harvesting is permitted where it is essential for insect control to curtail severe damage to forest values at the landscape level in a beetle management unit (BMU) classified as suppression for that insect pest.

#### 16.6.1.3 LAO Objective 29

Design Harvest areas to mimic existing natural openings, vegetation patterns, and natural features when viewed from the high elevation viewpoints as defined by the spatial dataset, Cariboo-Chilcotin High Elevation Viewpoints.

### 16.6.2 Current Practice

1. The FSP holder will ensure that roads and cutblocks within a Visual Quality Objective polygon in a known scenic area will conduct a visual impact assessment that ensures the VQO alteration resulting from the size, shape and location of cutblocks and roads is consistent with the FPPR 1.1 categories of Visually Altered Forest Landscapes.
2. The FSP holder will assess the proposed visual alteration from one or more significant public viewpoints, located on water or land, that provides a viewing opportunity and has relevance to the landscape being assessed. FREP Protocols and the Visual Impact Assessment Guidebook will be used as guidance.
3. VQO alterations can be exceeded where harvesting is essential for insect control and all other known infestation sites have already been addressed or where harvesting is required for interface fuel breaks.
4. In severely burnt scenic areas where salvage will exceed the alteration allowed, but may enhance post-wildfire green-up through post-harvest reforestation, the FSP holder can exceed the VQOs if:
  - a. a reforestation plan is completed that demonstrates that exceeding the VQO will result in a net benefit to visual green-up recovery,
  - b. public consolation is conducted, and
  - c. the harvest design will not be rectilinear or geometric in shape, retain green trees, and where practicable:
    - i. utilize multiple smaller openings vs single large openings,
    - ii. describe the retention within cutblock boundaries,
    - iii. expedite rehabilitation of alteration from roads, trails, and landings,
    - iv. consider and incorporate input received from public consultation.
5. The FSP holder will ensure at the conclusion of harvesting that, subject to clauses 1-6, alterations as a result of PFA will achieve the VQOs consistent with the definitions in FPPR 1.1 Categories of Visually Altered Forest Landscapes.

Figure 37 presents the location where Visual Quality Objectives exist.

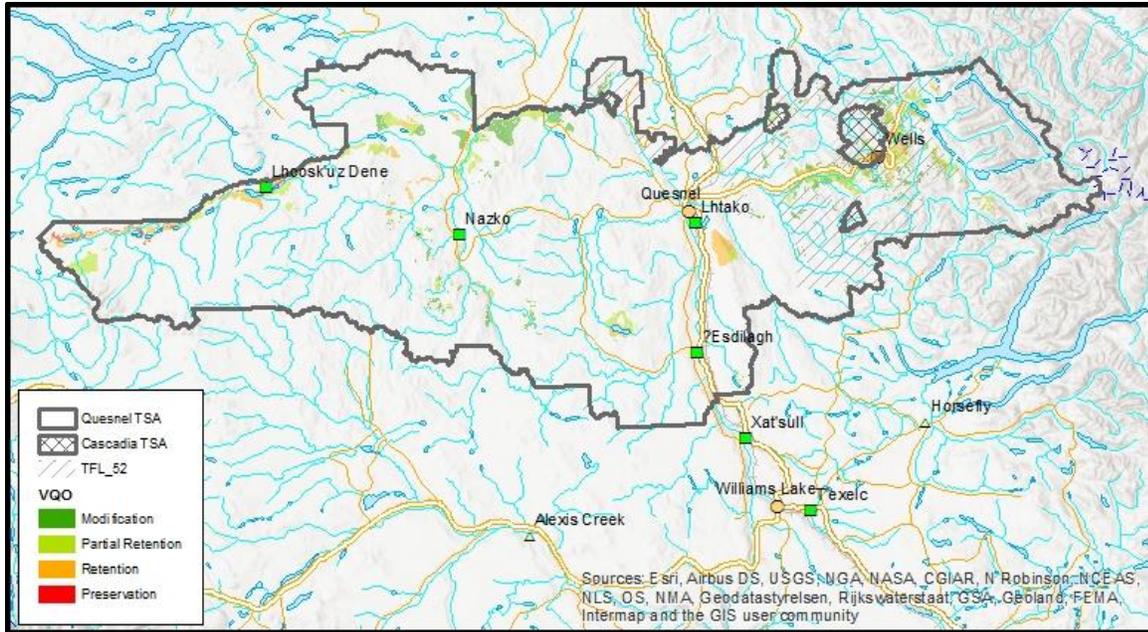


Figure 37. The location of visual quality objectives throughout the Quesnel TSA.

## 16.7 Recreation

### 16.7.1 Tourism

#### 16.7.1.1 Legal Objectives

##### 16.7.1.1.1 CCLUP 90 Day Report

To maintain the visual quality in the viewshed surrounding existing tourism operations... Forestry Strategies (to integrate with tourism needs) in order for the forest industry to operate in or near important tourism areas, their operations should incorporate tourism needs for high-quality environments, including:

- Tranquil Settings - forest operations in the mid and especially the backcountry should be conducted outside of the peak tourism season, to reduce the impact of noise.
- Scenic Quality - forest operations should either avoid or minimize impacts on scenic quality. Any impacts that do occur must be rehabilitated within a specified time period.
- Air Visibility Quality - smoke generation (through slash burning, etc.) should not impact tourism areas during peak tourism season.
- Setting Diversity - alternative silvicultural and harvesting systems should be employed to provide for a variety of forest settings.
- Controlled Access - access management planning should precede operations in order to incorporate tourism industry needs. Minimize or mitigate impacts to significant other commercial and non-commercial values and opportunities that occur in association with forest lands, including wildlife, fish, water, range, recreation, and tourism.

##### 16.7.1.2 Current Practice

1. The FSP holder will notify overlapping applicable licensed commercial recreation tenure holders and private tourism operators within 2 kms of the planned cutblock or road. Each party will be provided with a minimum of 60 days or less to identify any issues or concerns they may have with the proposed cutblock or road. A mitigation strategy will be created if issues are brought forward.

2. The FSP holder will consider comments received during the development phase of new cutblocks and roads and demonstrate a commitment to minimize or mitigate impacts identified in the comments received. The FSP holder will inform the parties of the FSP holder's decision. If an agreement cannot be achieved, the FSP holder will initiate the ministry dispute resolution process.

## 16.7.2 Recreation Sites and Trails

### 16.7.2.1 Legal Objective

#### 16.7.2.1.1 FRPA Section 56, Section 180 and Section 181

Interpretive forest sites, recreation sites and recreation trails that were legally designated from the forest practices code have been continued under FRPA Section 56 & Section 180. Where objectives for these interpretive forest sites, recreation sites and recreation trails were legally established under FPC, the objectives have been continued under FRPA Section 181

#### 16.7.2.2 Current Practice

The FSP holder will, prior to PFA, within 100 m of a site or trail with an established objective refer to the District Recreation Officer and develop a mitigation strategy that addresses the District Recreation Officer's comments.

Through the Recreation Sites and Trails British Columbia (RSTBC) Program, the Province of British Columbia provides public recreation opportunities by developing, maintaining and managing a network of sites and trails. Within the overall planning area, there are 122 active recreation sites and about 1100 kilometres of trails. Not all of these sites have established objectives.

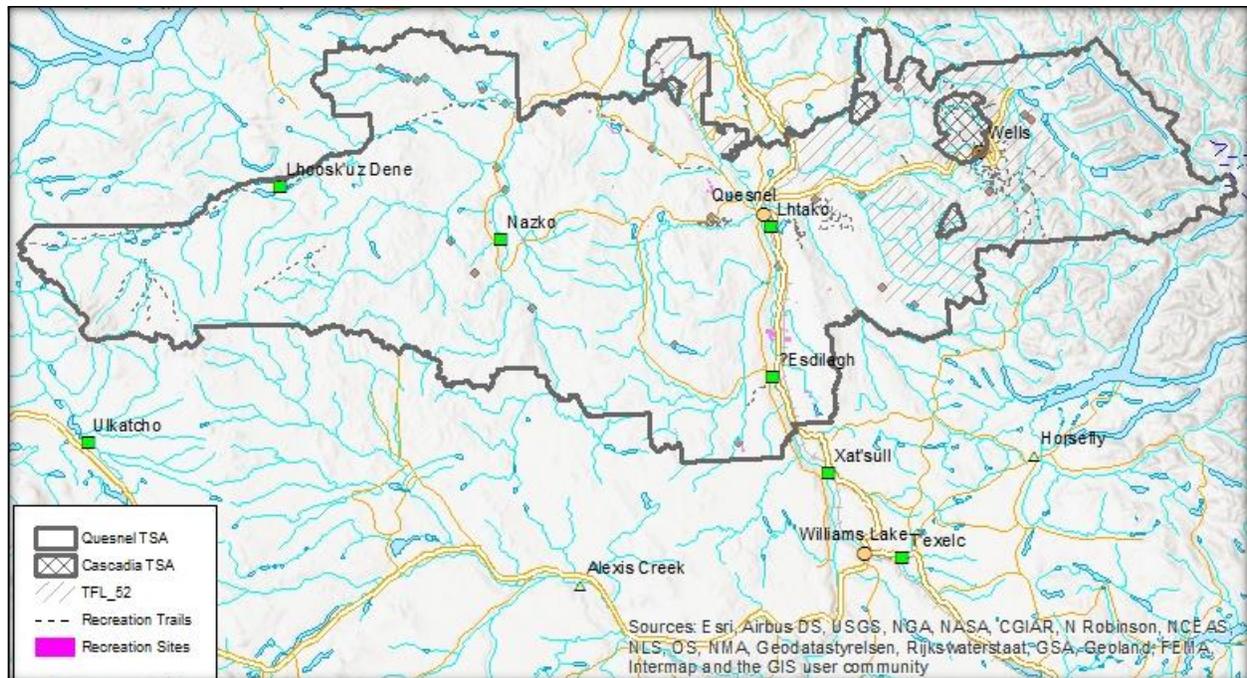


Figure 38: Map of the recreation sites and recreation trails within the Quesnel TSA.

### 16.7.3 Backcountry

#### 16.7.3.1 *Legal Objective*

##### 16.7.3.1.1 CCLUP 90 Day Report

1. Maintenance of backcountry recreation opportunities in a significant portion of the areas of the region that are presently in a backcountry condition, principally in the Special Resource Development Zone.
2. Maintaining environmental and backcountry values through improved access management.
3. Maintenance of backcountry recreation opportunities along regionally significant rivers and trails.
4. Maintain the % of the CCLUP polygons in a backcountry condition.

##### 16.7.3.2 *Current Practice*

1. Where an access management plan or sub-regional management plan addressing access management has been endorsed by an SDM, the FSP holder will adhere to the plan.
2. The FSP holder will notify registered guide outfitters, registered trappers, known clubs and associations with overlapping tenures for a minimum of 60 days.
3. The FSP holder and tenure holder will create a mitigation strategy if required. If a mitigation strategy cannot be agreed upon, the FSP holder will initiate the ministry dispute resolution process.
4. The FSP holder will consider cutblock and road related comments received in Clause 2 and 3 during the development phase of new cutblocks and roads.

### 16.7.4 Land Act Order Trails

#### 16.7.4.1 *Legal Objectives*

##### 16.7.4.1.1 LAO Objective 30

For the buffered trails.....maintain 50 metre management zones on either side, with the treed area inside the management zones managed to the combined minimum basal area retention of 85 percent, except where roads cross trails.

##### 16.7.4.1.2 LAO Objective 30

Despite Objective 30, primary forest activities that remove more than 15 percent of the basal area within the management zones are permitted for any of the following reasons:

- Where harvesting is essential for insect control to curtail severe damage to forest values at the landscape level in a beetle management unit (BMU) classified as suppression for that insect pest;
- Where harvesting is necessary to manage for blowdown where that helps to maintain the recreational value of the trail.

##### 16.7.4.2 *Current Practice*

1. For buffered Land Act Order (LAO) trails shown on the CCLUP LAO map, the FSP holder will ensure PFA maintain a 50 m management zone on both sides of the trails center line and maintain a minimum of 85% of the pre-harvest basal area as retention in the treed portion except where roads cross the trail.
2. Harvesting activities that remove more than 15 % of the basal area is permitted for any of the following circumstances:
  - a) Harvesting is essential for insect control;

- b) Harvesting is necessary to maintain the recreation value of the trail by recovering blowdown, or to prevent blowdown from occurring;
- c) Harvesting is required within primary and interface fuel breaks;
- d) Harvesting is required to implement a management plan developed by a QRP, agreed to by the primary user of the trail and endorsed by FLNRORD.

The LAO identifies 8,548 hectares of buffer along important trails within the overall planning area. Of this amount, a total of 6,951 hectares is within the FLP area (Figure 39).

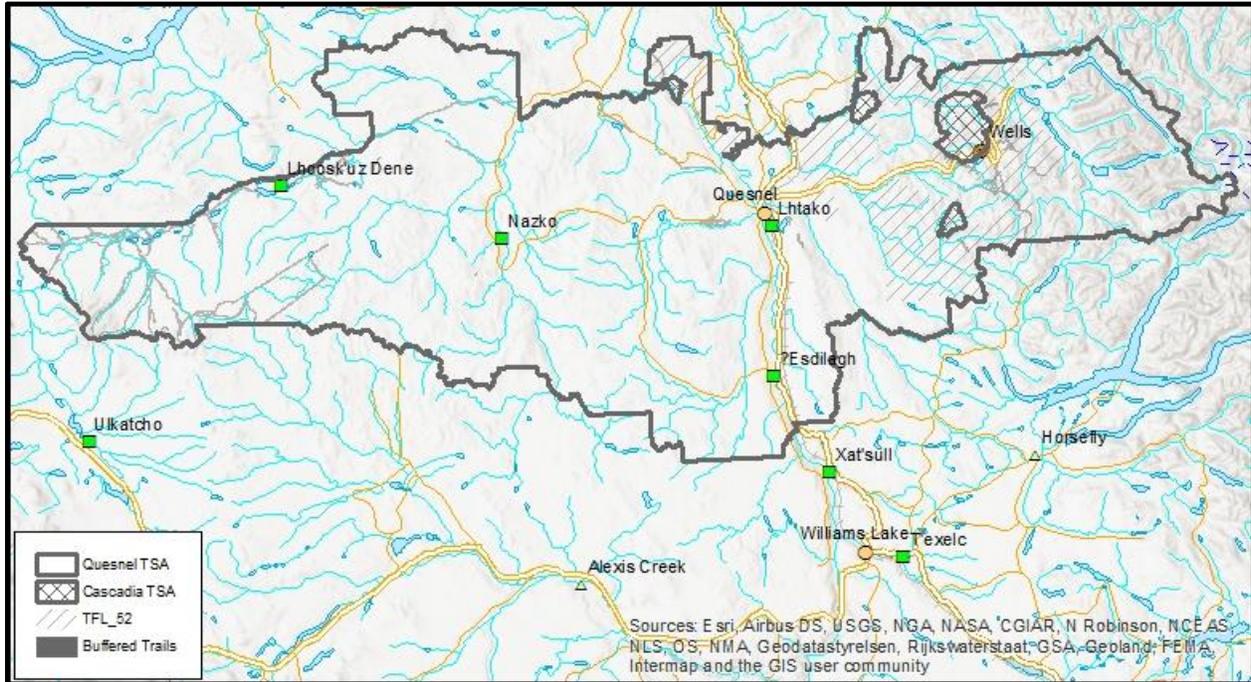


Figure 39: Map of the LAO buffered trails within the Quesnel TSA.

## 16.7.5 Alexander MacKenzie Heritage Trail / NuXalk – Carrier Grease Trail

### 16.7.5.1 Legal Objectives

#### 16.7.5.1.1 CCLUP 90 Day Report pg. 74

To maintain the visual quality in the viewshed surrounding the Blackwater River, The Mackenzie/Grease Trail, and Protected Area. To implement the measure included in the Mackenzie/Grease Trail Management Plan (aka Nuxalk – Carrier Grease Trail).

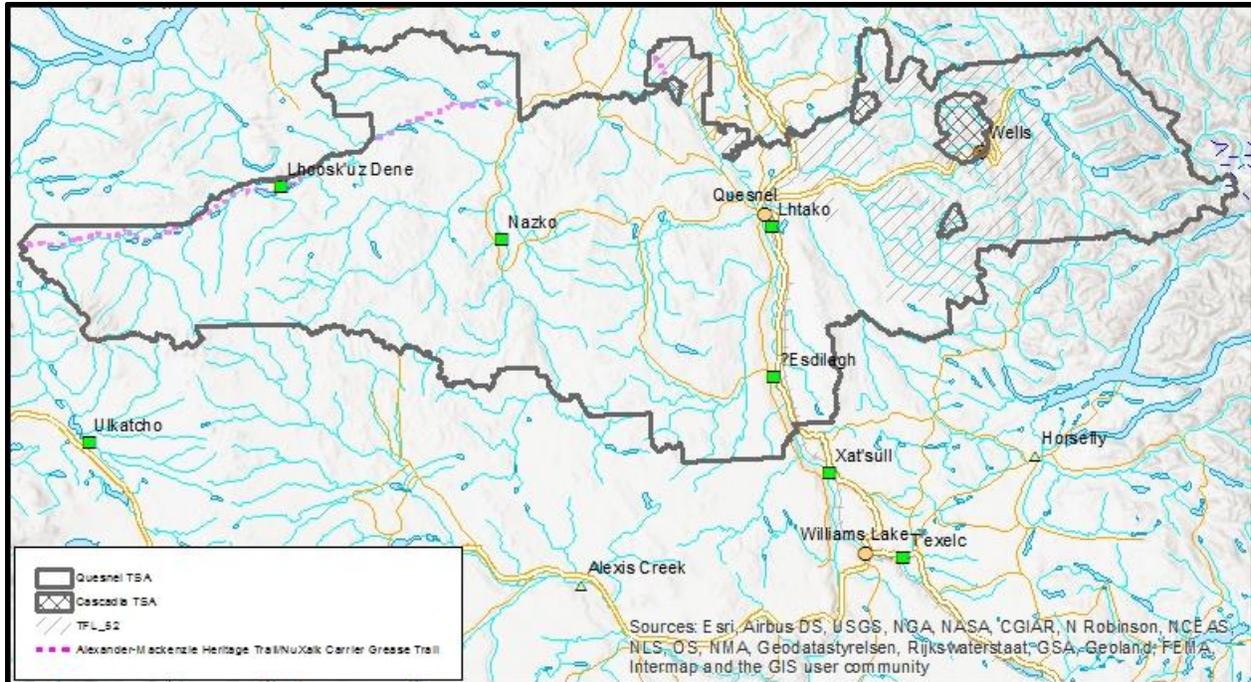


Figure 40: Map of the Mackenzie/Grease Trail - aka Nuxalk – Carrier Grease Trail within the Quesnel TSA.

#### 16.7.5.1.2 Heritage Conservation Act 4

The Province may enter into a formal agreement with a First Nation with respect to the conservation and protection of heritage sites and heritage objects that represent the cultural heritage of the aboriginal people who are represented by that first nation... the agreement must identify actions which would constitute a desecration, or which would detract from the heritage value of scheduled sites and objects, and different actions may be identified for different sites or objects or for different classes of sites or objects.

#### 16.7.5.2 Current Practice

1. Within 100 m of the centre line of the trail, the FSP holder will obtain an agreement in writing from the SDM responsible for the Heritage Conservation Act that the proposed activities are compatible with the management of the heritage resource values as per HCA 4 and ensure that the PFA are consistent with the general guidelines and specific constraints outlined in Alexander MacKenzie Trail Management Plan.
2. Within the viewscape of the trail, the FSP holder will ensure:
  - a. for the aboriginal footpath, wagon road and four-wheel drive road portions of the trail, maintain a visual quality objective of preservation;
  - b. for the gravel road sections of the trail, maintain a visual quality objective of partial retention.
3. The FSP holder will ensure PFA are consistent with the management strategy for the trail.

## 16.7.6 Wildcraft

### 16.7.6.1 *Legal Objectives*

#### 16.7.6.1.1 CCLUP 90 Day Report

Maintain roaded access over the portion (%) of the polygons (sub-units) in the Enhanced Resource Development Zones, the Integrated Resource Development Zones and the Special Resource Development Zones as specified within the CCLUP.

#### 16.7.6.2 *Current Practice*

1. Where the government initiates and makes known an access management plan or process within the FDU, the FSP holder will conduct primary forest activities consistent with the access management plan for the area.
2. Prior to establishing an access control or deactivation that eliminates vehicle access on an existing tenured road which has been in place for greater than 5 years, the FSP holder will notify the parties listed below specifying a referral period and placing an advertisement in the local newspaper(s) greater than 60 days prior to the activities occurring, or less as approved by the SDM, or by agreement with the affected parties, including:
  - a. First Nations whose traditional territory overlaps the location of the proposed access control; and
  - b. Stakeholders who have the potential to be impacted due to the access control.
3. The FSP holder will consider comments received during the development phase of new cutblocks and roads and demonstrate a commitment to minimize or mitigate impacts identified in the comments received. The FSP holder will inform the parties of the FSP holders' decision. If an agreement cannot be achieved, the FSP holder will initiate the ministry dispute resolution process.
4. The FSP holder will ensure PFA are consistent with the mitigation strategy for wildcraft in Clause 3.

## 16.8 Cultural Heritage

### 16.8.1 Pine Mushrooms

#### 16.8.1.1 *Legal Objectives*

##### 16.8.1.1.1 CCLUP 90 Day Report

1. Maintain key pine mushroom harvesting sites in a condition that promotes mushroom growth.
2. Maintain key pine mushroom sites in a condition conducive to pine mushroom growth and harvest the Anahim IRMZ.
3. Maintain or enhance the wildcraft resource at or from its present level of use as per the Anahim Round Table Sub-Regional Plan.

##### 16.8.1.1.2 Anahim Round Table Sub Regional Plan

Maintain or enhance the wildcraft resource at or from its present level of use as per the Anahim Round Table Sub-Regional Plan.

#### 16.8.1.2 *Current Practice*

1. The FSP holder will have a QRP completed an assessment for the proposed PFA and create a pine mushroom management plan to mitigate the impacts on the pine mushroom plant community that is consistent to the extent practicable with the following information sources:
  - a. available pine mushroom spatial data, and

- b. pine mushrooms areas identified from information sharing for cultural heritage resources with First Nations in the Anaheim IRMZ, Kleena Kleene IRMZ and Charlotte Alplands SRDZ, and
  - c. field identification of areas with high suitability as pine mushroom habitat defined by:
    - i. very coarse texture soils >60% sands and less than 5% clay, mor humus which is thin (<10cm) to absent, and
    - ii. the forest is poor quality pine leading stands, greater than >65 years of age, with little understory and a high proportion of snags.
2. The FSP holder will ensure:
- a. that the recommendations from the assessment and management plan are followed when primary forest activities are conducted in relation to the cutblock or road, and
  - b. that the final management plan is shared with First Nations who provided local pine mushroom area info prior to the declaration of ADV or submission of CPs or RPs.

## 16.8.2 Cultural Heritage Resources (CHR)

### 16.8.2.1 *Legal Objectives*

#### 16.8.2.1.1 FPPR 10

The Objective set by government for cultural heritage resources is to conserve or if necessary, protect cultural heritage resources that are:

1. The focus of a traditional use by an aboriginal people that is of continuing importance to that people:
2. Not regulated under the Heritage Conservation Act

### 16.8.2.2 *Current Practice*

1. The FSP holder will share information regarding the location of proposed cutblocks and roads with First Nations for a minimum of 60 days (or consistent with current government policy) prior to the submission of a cutting permit or road permit to government for approval. This information sharing is done with First Nations whose asserted traditional territory overlaps the area of proposed development.
2. When proposing harvesting or road construction in the Anaheim IRMZ, Kleena Kleene IRMZ and Charlotte Alplands SRDZ, the FSP holder will, as part of the information sharing process in clause 1, request information regarding pine mushrooms. The FSP holder will follow the strategy within Section 15.8.1 (Pine Mushrooms) of this document.
3. Where a cultural heritage resource (CHR) is made known or identified, as a result of Clause 1, to the FSP holder through written correspondence during the specified referral period, will:
  - a. develop a CHR mitigation strategy with the involvement of the concerned First Nation; and
  - b. submit a summary of the strategy to the relevant District Manager prior to submission of cutting permits and road permits.
4. The FSP holder will, upon or prior to submission of a cutting permit or road permit, submit to government an information sharing summary documenting:
  - a. proof of information sharing to those First Nations whose asserted traditional territory overlaps the proposed development; and
  - b. correspondence resulting from information sharing.

## 16.9 Grazing – Maintenance of Animal Unit Months

### 16.9.1 Legal Objectives

#### 16.9.1.1 CCLUP 90 Day Report

1. Plan and manage forest development to minimize or mitigate the impacts to other values, including significant fish, wildlife, range, cultural heritage, recreation and tourism values and opportunities; and...
2. To maintain the current authorized level of AUM in the polygon where the current authorized level of AUM for the polygon is as listed in the CCLUP.... and to maintain the existing proportion of AUMs by range unit within the polygons....

### 16.9.2 Current Practice

1. Where it is made known to the FSP holder by government or a grazing tenure holder that one or more of the following conditions are present:
  2. the designated AUM level as of February 15, 1995, for the polygon is unsustainable or unachievable as a direct result of the primary forest activities conducted by a holder of this FSP; or
  3. the proportion of AUMs by range unit within the polygon, as per the February 15, 1995 availability of AUMs, has changed and that AUM availability in one or more range units within the polygon is decreasing as a direct result of primary forest activities,
  4. then the FSP holder conducting primary forest activities within the identified range unit(s) will enter into consultation with the affected range tenure holders and modify harvesting and silviculture practices to maintain the February 15, 1995 AUM levels by polygon and the February 15, 1995 AUM levels by range unit.
5. The FSP holder will comply with section 15.10.2 of this document to refer proposed developments and engage in discussion with the range tenure holder.

Active range tenures occupy a total of 1,035,426 hectares within the overall planning area (Figure 41).

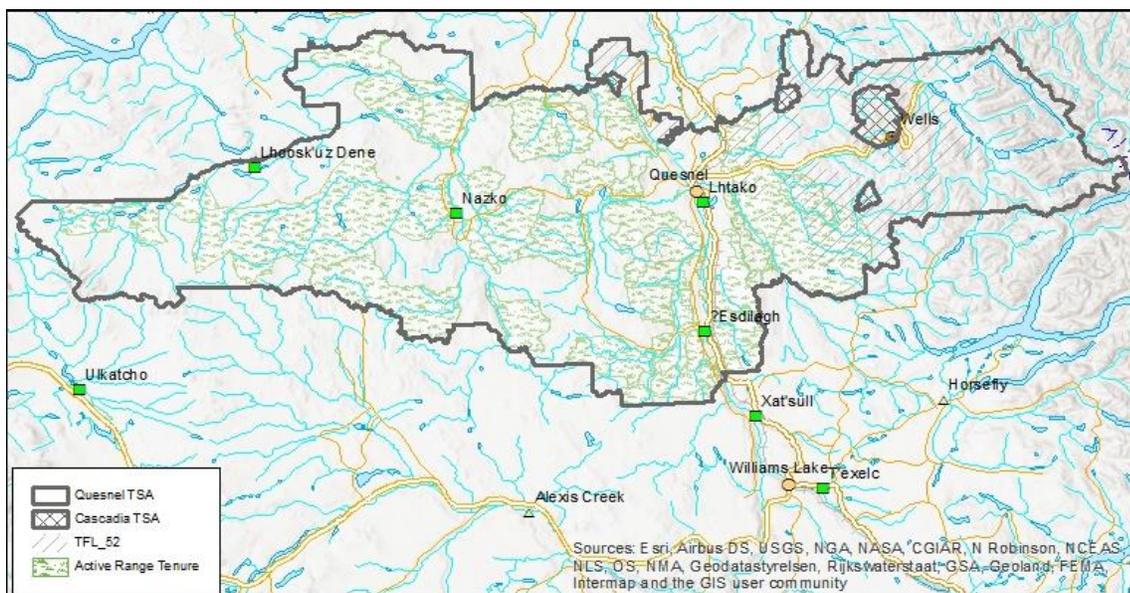


Figure 41: Map of the active range within the Quesnel TSA.

## 16.10 Natural Range Barrier Measures

### 16.10.1 Legal Objectives

#### *16.10.1.1 FPPR Sec. 18*

For the purpose of Section 48 (Natural Range Barriers) of the Forest and Range Practices Act, a person who prepares a forest stewardship plan must specify measures to mitigate the effect of removing or rendering ineffective natural range barriers.

### 16.10.2 Current Practice

1. The FSP holder, at a minimum of 60 days prior to submission of a cutting permit or road permit, will share information regarding the location of the proposed cutblocks and roads with range tenure holders whose tenured area overlaps the area of proposed development and specify a referral period.
2. Where the range tenure holder responds in writing to the FSP holder within the referral period that a natural range barrier will be removed or rendered ineffective as a result of the proposed harvesting or road building activities, and the FSP holder is in agreement, the FSP holder will construct fence lines and install cattleguards and/or gates in accordance with accepted standards to prevent cattle drift within one year, where practicable, following the removal or rendering ineffective of the natural range barrier.
3. Where the range tenure holder responds in writing to the FSP holder within the referral period that a natural range barrier will be removed or rendered ineffective as a result of the proposed harvesting or road building activities, and the FSP holder disagrees, the FSP holder will conduct a meeting between the District Range Officer, the FSP holder and the range tenure holder to reach agreement. If agreement is not reached, the decision will be at the sole discretion of the District Manager and the FSP holder will implement the decision.
4. Where the range tenure holder does not respond to the information sharing and the FSP holder is aware of the potential for a natural range barrier to be removed or rendered ineffective through harvesting or road building activities, the FSP holder will contact the District Range Officer for a decision.
5. Where the range tenure holder responds in writing to the FSP holder within the referral period that a conflict will be generated between the tenure holder's range use plan and the proposed primary forest activities, the FSP holder will conduct a meeting between the District Range Officer, the FSP holder and the range tenure holder to reach agreement. If agreement is not reached, the decision will be at the sole discretion of the District Manager and the FSP holder will implement the decision.

## 16.11 Invasive Plant Measures

### 16.11.1 Legal Objectives

#### *16.11.1.1 FPPR 17*

For the purpose of Section 47 (invasive plants) of the *FPPR*, a person who prepares a forest stewardship plan must specify measures in the plan to prevent the introduction or spread of species of plants that are invasive plants under the Invasive Plants Regulation, if the introduction or spread is likely to be the result of the person's forest practices.

### 16.11.2 Current Practice

1. The FSP holder will:
  - a. apply grass seed to those areas of contiguous exposed mineral soil greater than 0.1 ha associated with road cut slopes, fill slopes, ditch lines and right-of-way landings within one year following access construction, reconstruction or deactivation, with the exception of:
    - i. where grass seeding would be inconsistent with a Wildlife Habitat Area requirement;
    - ii. where grass seeding would be inconsistent with an ungulate winter range requirement; or
    - iii. where grass seeding would be inconsistent with other legislated requirements;
  - b. when excavating and transporting material for use in road or other construction, assess the material source for invasive plants, and where invasive plants are identified, will clear the site of overburden before excavation;
  - c. report previously un-identified infestations of invasive plants through the Report-A Weed application ([www.gov.bc.ca/invasive-species](http://www.gov.bc.ca/invasive-species)), within 60 days of that new infestation being identified;
  - d. if invasive plants, excluding bull thistle, are present during mechanical site preparation, harvesting or roadbuilding operations, the FSP holder will instruct its contractors and its staff to remove any identified plant material or accumulations of soil which may contain invasive plant material from machinery, vehicles, personnel, and pets prior to moving to subsequent areas, to the extent practicable.

## 17 Appendix A

The following table outlines the wildlife tree retention targets in order to achieve section 15.5.6 Wildlife and Biodiversity- Stand Level.

Landscape Unit QW	Biogeoclimatic Unit	WTR Target (% gross area)	Landscape Unit	Biogeoclimatic Unit	WTR Target (% gross area)
Abhau	SBS dw 1_na	6	Coglistiko	SBPSdc_na	6
Abhau	SBS dw 2_na	5	Coglistiko	SBPSmc_na	6
Abhau	SBS mh_na	3	Coglistiko	SBS mc 2_na	7
Abhau	SBS mw_na	6	Cunningham	ESSFwc 3_na	5
Antler	ESSFwc 3_na	1	Cunningham	ESSFwk 1_na	7
Antler	ESSFwew_na	1	Cunningham	ICH wk 4_na	7
Antler	ESSFwk 1_na	8	Downton	ESSFvx 1_na	0
Antler	SBS wk 1_na	9	Downton	MS xv_na	0
Baezaeko	MS xv_na	7	Dragon	IDF dk 3_FirGroup	8
Baezaeko	SBPSdc_na	8	Dragon	IDF dk 3_PineGroup	8
Baezaeko	SBPSmk_na	8	Dragon	IDF xm FirGroup	8
Baezaeko	SBPSmk_na	8	Dragon	IDF xm_PineGroup	8
Baezaeko	SBS dw 2_na	8	Dragon	SBS dw 1_na	8
Baezaeko	SBS mc 2_na	8	Dragon	SBS dw 2_na	8
Baker	MS xv_na	8	Dragon	SBS mc 1_na	8
Baker	SBPSdc_na	8	Dragon	SBS mh_na	8
Baker	SBPSmk_na	8	Eliguk	ESSFvx 1_na	0
Baker	SBS dw 1_na	6	Eliguk	MS xv_na	4
Baker	SBS dw 2_na	8	Eliguk	SBPSmc_na	6
Baker	SBS mc 2_na	7	Eliguk	SBS mc 2_na	7
Baker	SBS mh_na	8	Eliguk	SBS mc 3_na	7
Betty Wendle	ESSFwc 3_na	0	Euchiniko	SBPSdc_na	6
Betty Wendle	ESSFwcp_na	0	Euchiniko	SBPSmk_na	6
Betty Wendle	ESSFwew_na	0	Euchiniko	SBSdk	6
Betty Wendle	ESSFwk 1_na	0	Euchiniko	SBSdw2	6
Betty Wendle	ICH wk 4_na	0	Euchiniko	SBS mc 2_na	6
Betty Wendle	SBS wk 1_na	0	Euchiniko	SBS mc 3_na	7
Big Valley	ESSFwc 3_na	7	Gerimi	SBS mh_na	7
Big Valley	ESSFwk 1_na	8	Gerimi	SBS mw_na	7
Big Valley	SBS wk 1_na	9	Gerimi	SBS wk 1_na	6
Bowron	ESSFwc 3_na	3	Indianpoint	ESSFwc 3_na	1
Bowron	ESSFwk 1_na	6	Indianpoint	ESSFwk 1_na	6
Bowron	ICH wk 4_na	3	Indianpoint	ICH wk 4_na	6
Bowron	SBS wk 1_na	4	Indianpoint	SBS wk 1_na	6
Chine	MS xv_na	7	Jack of Clubs	ESSFwc 3_na	5
Chine	SBPSdc_na	5	Jack of Clubs	ESSFwk 1_na	6
Chine	SBPSmc_na	5	Jack of Clubs	SBS wk 1_na	7
Chine	SBS mc 2_na	7	Kluskus	ESSFvx 1_na	4
Clisbako	MS xv_na	7	Kluskus	MS xv_na	4
Clisbako	SBPSdc_na	7	Kluskus	SBPSdc_na	6
Clisbako	SBPSmk_na	8	Kluskus	SBPSmc_na	6

Landscape Unit QW	Biogeoclimatic Unit	WTR Target (% gross area)	Landscape Unit	Biogeoclimatic Unit	WTR Target (% gross area)
Clisbako	SBPSxc_na	8	Lightning	ESSFwc 3_na	6
Coglistiko	MS xv_na	6	Lightning	ESSFwk 1_na	9
Lightning	SBS mw_na	8	Snaking	ESSFmv 1_na	9
Lightning	SBS wk 1_na	9	Snaking	SBPSdc_na	8
Marmot	ESSFmv 1_na	9	Snaking	SBPSmk_na	8
Marmot	MS xv_na	7	Snaking	SBS mc 2_na	8
Marmot	SBPSdc_na	8	Swift	ESSFwc 3_na	3
Marmot	SBPSmk_na	8	Swift	ESSFwk 1_na	8
Marmot	SBS dw 2_na	8	Swift	SBS wk 1_na	9
Marmot	SBS mc 2_na	7	Tibbles	MS xv_na	7
Matthew	ESSFwc 3_na	4	Tibbles	SBPSdc_na	8
Matthew	ESSFwk 1_na	8	Tibbles	SBPSmk_na	8
Matthew	ICH wk 4_na	10	Tibbles	SBS mc 2_na	8
Narcosli	IDF xm FirGroup	9	Toil	MS xv_na	2
Narcosli	IDF xm PineGroup	8	Toil	SBPSmk_na	6
Narcosli	SBPSmk_na	8	Twan	IDF dk 3_FirGroup	7
Narcosli	SBS dw 1_na	10	Twan	IDF dk 3 PineGroup	8
Narcosli	SBS dw 2_na	8	Twan	IDF xm FirGroup	7
Narcosli	SBS mc 2_na	8	Twan	IDF xm PineGroup	6
Narcosli	SBS mh_na	7	Twan	SBPSdc_na	8
Pan	ESSFxv 1_na	0	Twan	SBPSxc_na	8
Pan	MS xv_na	4	Twan	SBS dw 2_na	8
Pan	SBPSmc_na	6	Umiti	ESSFwc 3_na	4
Pan	SBS mc 2_na	7	Umiti	ESSFwk 1_na	10
Pantage	ESSFmv 1_na	8	Umiti	SBS dw 1_na	10
Pantage	SBPSdc_na	8	Umiti	SBS mh_na	10
Pantage	SBPSmk_na	8	Umiti	SBS mw_na	10
Pantage	SBS dw 1_na	8	Umiti	SBS wk 1_na	10
Pantage	SBS dw 2_na	8	Victoria	ESSFwc 3_na	5
Pantage	SBS mc 2_na	8	Victoria	ESSFwk 1_na	6
Pelican	ESSFmv 1_na	7	Victoria	SBS mw_na	7
Pelican	SBPSdc_na	7	Victoria	SBS wk 1_na	8
Pelican	SBPSmk_na	7	Wentworth	MS xv_na	8
Pelican	SBS dw 2_na	7	Wentworth	SBPSdc_na	9
Pelican	SBS mc 2_na	7	Wentworth	SBPSmk_na	9
Ramsey	IDF dk 3 FirGroup	10	Wentworth	SBS mc 2_na	9
Ramsey	IDF dk 3 PineGroup	10	Whittier	SBPSmk_na	8
Ramsey	MS xv_na	8	Whittier	SBS dw 1_na	8
Ramsey	SBPSdc_na	9	Whittier	SBS dw 2_na	8
Ramsey	SBPSmk_na	9	Whittier	SBS mc 2_na	8
Ramsey	SBS dw 2_na	9	Whittier	SBS mh_na	8

Landscape Unit QW	Biogeoclimatic Unit	WTR Target (% gross area)	Landscape Unit	Biogeoclimatic Unit	WTR Target (% gross area)
Ramsey	SBS mc 2 na	8	Willow	ESSFwc 3 na	5
Sandy	ESSFwc 3 na	0	Willow	ESSFwk 1 na	8
Sandy	ESSFwk 1 na	0	Willow	SBS wk 1 na	9
Sandy	ICH wk 4 na	0			

The following table outlines compares Landscape Biodiversity CCLUP Targets with amount currently within the total forested area of the FLP.

Target Amount Based on CCLUP					Amount Currently Present Within the Total Forested Area						FLP area only
Landscape Unit - Biodiversity Emphasis	TOTAL FORESTED AREA	Maximum Early Area (ha)	Minimum Mature and Old Area (ha)	Minimum Old Area (ha)	Early Area (ha)	Intermediate Area (ha)	Mature Area (ha)	Old Area (ha)	Mature and Old Area (ha)	Mature and Old Percent (%)	Mature and Old Percent (%)
<b>Abhau - Low</b>	<b>33,772</b>	-	<b>3,715</b>	<b>3,715</b>	<b>13,049</b>	<b>11,714</b>	<b>4,980</b>	<b>4,030</b>	<b>9,009</b>	<b>27%</b>	<b>29%</b>
NDT3											
SBS											
dw 1 <sub>1</sub>	2,445	-	<b>269</b>	269	1,243	505	392	305	<b>697</b>	29%	0%
SBS											
dw 2 <sub>1</sub>	635	-	<b>70</b>	70	282	103	187	63	<b>250</b>	39%	6%
SBS											
mh <sub>1</sub>	5,359	-	<b>590</b>	590	884	1,703	1,314	1,459	<b>2,773</b>	52%	40%
SBS											
mw <sub>1</sub>	25,332	-	<b>2,787</b>	2,787	10,641	9,402	3,087	2,203	<b>5,290</b>	21%	24%
(blank)	1	-	-	-	-	1	-	-	-	0%	0%
<b>Antler - Intermediate</b>	<b>45,133</b>	<b>12,182</b>	<b>15,400</b>	<b>6,931</b>	<b>13,452</b>	<b>10,994</b>	<b>19,879</b>	<b>809</b>	<b>20,687</b>	<b>46%</b>	<b>29%</b>
NDT1											
ESSFw											
c 3 <sub>1</sub>	8,942	1,967	<b>3,219</b>	1,699	300	2,712	5,851	79	<b>5,930</b>	66%	71%
ESSFw											
cw <sub>1</sub>	1,758	387	<b>633</b>	334	5	972	762	20	<b>781</b>	44%	100%
ESSFw											
k 1	18,080	3,978	<b>6,509</b>	3,435	5,675	5,104	7,012	289	<b>7,301</b>	40%	26%
ICH											
wk 4	10	3	<b>3</b>	1	2	1	8	-	<b>8</b>	-	0%
NDT2											
SBS											
wk 1	16,243	5,847	<b>5,035</b>	1,462	7,470	2,107	6,245	421	<b>6,666</b>	41%	21%
NDT5											
ESSFw											
cp	100	-	-	-	-	99	1	-	<b>1</b>	1%	-
<b>Baezaeko - Low</b>	<b>75,544</b>	-	<b>7,620</b>	<b>7,172</b>	<b>43,579</b>	<b>9,324</b>	<b>13,783</b>	<b>8,859</b>	<b>22,642</b>	<b>30%</b>	<b>30%</b>
NDT3											

	MS xv	21,739	-	<b>3,043</b>	3,043	13,212	2,617	3,290	2,621	<b>5,911</b>	27%	27%
c <sub>1</sub>	SBPSd	28,021	-	<b>2,242</b>	1,961	14,188	5,237	6,187	2,409	<b>8,596</b>	31%	31%
mc	SBPS	10,265	-	<b>821</b>	719	6,135	367	1,773	1,990	<b>3,763</b>	37%	37%
mk	SBPS	6,462	-	<b>517</b>	452	4,086	690	1,350	336	<b>1,686</b>	26%	26%
dw 2 <sub>1</sub>	SBS	602	-	<b>66</b>	66	519	58	23	2	<b>25</b>	4%	-
mc 2	SBS	8,456	-	<b>930</b>	930	5,439	355	1,159	1,502	<b>2,661</b>	31%	31%
<b>Baker - High</b>		<b>87,458</b>	<b>39,903</b>	<b>25,311</b>	<b>11,055</b>	<b>42,692</b>	<b>18,073</b>	<b>20,176</b>	<b>6,516</b>	<b>26,693</b>	<b>31%</b>	<b>31%</b>
NDT3											-	
xv <sub>1</sub>	MS	700	245	<b>273</b>	147	580	10	102	7	<b>109</b>	16%	16%
c	SBPSd	17,205	8,602	<b>4,301</b>	1,720	5,997	7,125	3,118	965	<b>4,083</b>	24%	23%
mk <sub>1</sub>	SBPS	32,343	16,172	<b>8,086</b>	3,234	19,695	3,839	6,794	2,016	<b>8,809</b>	27%	27%
dw 1 <sub>2</sub>	SBS	3,427	1,371	<b>1,165</b>	548	331	1,671	1,198	226	<b>1,424</b>	42%	64%
dw 2 <sub>2</sub>	SBS	15,459	6,184	<b>5,256</b>	2,473	5,358	3,052	5,532	1,517	<b>7,049</b>	46%	50%
mc 2	SBS	17,066	6,826	<b>5,802</b>	2,731	10,711	1,449	3,125	1,781	<b>4,906</b>	29%	29%
mh <sub>2</sub>	SBS	1,259	504	<b>428</b>	201	20	927	308	5	<b>312</b>	25%	48%
<b>Betty Wendle - Low</b>		<b>15,297</b>	-	<b>2,747</b>	<b>2,444</b>	<b>169</b>	<b>149</b>	<b>1,360</b>	<b>13,618</b>	<b>14,979</b>	<b>98%</b>	<b>98%</b>
NDT1												
c 3 <sub>1</sub>	ESSFw	2,425	-	<b>461</b>	461	17	-	195	2,213	<b>2,407</b>	99%	99%
cw <sub>1</sub>	ESSFw	397	-	<b>75</b>	75	1	-	67	329	<b>396</b>	100%	100%
k 1	ESSFw	4,845	-	<b>921</b>	921	132	0	290	4,423	<b>4,713</b>	97%	97%
wk 4	ICH	7,592	-	<b>1,291</b>	987	19	148	782	6,643	<b>7,425</b>	98%	98%
NDT5											-	
cp	ESSFw	38	-	-	-	-	-	27	11	<b>38</b>	100%	100%
<b>Big Valley - Low</b>		<b>18,323</b>	-	<b>3,292</b>	<b>3,011</b>	<b>6,913</b>	<b>2,944</b>	<b>8,281</b>	<b>185</b>	<b>8,465</b>	<b>46%</b>	<b>52%</b>
NDT1												
c 3 <sub>1</sub>	ESSFw	2,108	-	<b>400</b>	400	295	380	1,429	4	<b>1,433</b>	68%	81%
cw <sub>1</sub>	ESSFw	157	-	<b>30</b>	30	-	93	64	-	<b>64</b>	41%	0%
k 1 <sub>1</sub>	ESSFw	11,367	-	<b>2,160</b>	2,160	4,350	2,036	4,827	154	<b>4,981</b>	44%	50%
NDT2											-	
wk 1	SBS	4,682	-	<b>702</b>	421	2,268	427	1,960	27	<b>1,987</b>	42%	45%
NDT5												
cp	ESSFw	5	-	-	-	-	5	-	-	-	-	-
(blank)		4	-	-	-	-	4	-	-	-	-	-

<b>Bowron - Low</b>	<b>35,210</b>	<b>-</b>	<b>6,077</b>	<b>5,043</b>	<b>2,882</b>	<b>5,045</b>	<b>21,019</b>	<b>6,263</b>	<b>27,282</b>	<b>77%</b>	<b>91%</b>
NDT1											
ESSFw											
c 3 <sub>2</sub>	2,758	-	<b>524</b>	524	87	512	1,590	569	<b>2,159</b>	78%	91%
ESSFw											
cw <sub>2</sub>	1,045	-	<b>199</b>	199	32	258	593	161	<b>754</b>	72%	90%
ESSFw											
k 1 <sub>2</sub>	7,884	-	<b>1,498</b>	1,498	1,036	1,888	3,269	1,691	<b>4,961</b>	63%	76%
ICH											
wk 4 <sub>1</sub>	18,138	-	<b>3,084</b>	2,358	1,241	1,593	12,155	3,148	<b>15,304</b>	84%	95%
NDT2											
SBS											
wk 1 <sub>1</sub>	5,155	-	<b>773</b>	464	486	736	3,241	692	<b>3,933</b>	76%	98%
NDT5											
ESSFw											
cp	229	-	-	-	-	57	170	2	<b>172</b>	75%	92%
<b>Chine - Intermediate</b>	<b>54,335</b>	<b>35,184</b>	<b>9,570</b>	<b>4,031</b>	<b>21,144</b>	<b>10,261</b>	<b>15,782</b>	<b>7,148</b>	<b>22,930</b>	<b>42%</b>	<b>42%</b>
NDT3											
MS											
xv <sub>1</sub>	586	269	<b>152</b>	82	314	-	257	14	<b>272</b>	46%	46%
SBPSd											
c <sub>1</sub>	44,021	29,054	<b>7,484</b>	3,081	16,390	9,419	13,346	4,866	<b>18,212</b>	41%	41%
SBPS											
mc <sub>2</sub>	5,057	3,338	<b>860</b>	354	2,452	500	1,354	752	<b>2,106</b>	42%	42%
SBS											
mc 2 <sub>2</sub>	4,671	2,522	<b>1,074</b>	514	1,989	342	825	1,516	<b>2,340</b>	50%	50%
<b>Clisbako - Intermediate</b>	<b>57,248</b>	<b>30,915</b>	<b>12,823</b>	<b>6,411</b>	<b>30,067</b>	<b>5,676</b>	<b>15,011</b>	<b>6,494</b>	<b>21,504</b>	<b>38%</b>	<b>37%</b>
NDT3											
MS xv	34,343	15,798	<b>8,929</b>	4,808	16,747	3,649	9,053	4,893	<b>13,946</b>	41%	41%
SBPSd											
c <sub>1</sub>	2,514	1,659	<b>427</b>	176	1,659	339	399	117	<b>516</b>	21%	21%
SBPS											
mk <sub>1</sub>	10,276	6,782	<b>1,747</b>	719	6,518	802	2,412	545	<b>2,956</b>	29%	28%
SBPSx											
c	10,115	6,676	<b>1,719</b>	708	5,143	886	3,147	939	<b>4,086</b>	40%	40%
<b>Coglistiko - Intermediate</b>	<b>50,184</b>	<b>27,673</b>	<b>11,015</b>	<b>5,409</b>	<b>18,662</b>	<b>3,673</b>	<b>12,762</b>	<b>15,086</b>	<b>27,849</b>	<b>55%</b>	<b>55%</b>
NDT3											
MS xv	24,073	11,074	<b>6,259</b>	3,370	5,416	1,423	6,370	10,864	<b>17,234</b>	72%	72%
SBPSd											
c	9,607	6,340	<b>1,633</b>	672	4,290	804	2,736	1,777	<b>4,513</b>	47%	47%
SBPS											
mc	11,220	7,405	<b>1,907</b>	785	5,836	1,157	2,525	1,702	<b>4,227</b>	38%	38%
SBPS											
mk	1	1	<b>0</b>	0	1	-	-	-	-	0%	28%
SBS											
mc 2	5,284	2,853	<b>1,215</b>	581	3,120	290	1,131	744	<b>1,874</b>	35%	40%
<b>Cunningham - Low</b>	<b>31,741</b>	<b>-</b>	<b>5,775</b>	<b>5,341</b>	<b>5,099</b>	<b>2,448</b>	<b>19,190</b>	<b>5,004</b>	<b>24,194</b>	<b>76%</b>	<b>76%</b>
NDT1											
ESSFw											
c 3 <sub>1</sub>	6,817	-	<b>1,295</b>	1,295	156	276	5,778	607	<b>6,385</b>	94%	94%
ESSFw											
cw <sub>1</sub>	2,175	-	<b>413</b>	413	22	73	1,934	145	<b>2,079</b>	96%	96%
ESSFw											
k 1	11,688	-	<b>2,221</b>	2,221	2,156	1,455	6,928	1,148	<b>8,077</b>	69%	69%

wk 4	ICH	10,861	-	<b>1,846</b>	1,412	2,765	621	4,377	3,099	<b>7,476</b>	69%	69%
cp	NDT5 ESSFw	201	-	-	-	-	23	172	5	<b>177</b>	88%	89%
	<b>Downton - Intermediate</b>	<b>9,861</b>	<b>4,451</b>	<b>2,574</b>	<b>1,340</b>	<b>17</b>	<b>429</b>	<b>1,418</b>	<b>7,998</b>	<b>9,415</b>	<b>95%</b>	<b>95%</b>
v 1	NDT2 ESSFx	758	273	<b>212</b>	68	-	81	501	176	<b>677</b>	89%	89%
	NDT3											
	MS xv	9,084	4,178	<b>2,362</b>	1,272	17	329	917	7,822	<b>8,738</b>	96%	96%
vp	NDT5 ESSFx	20	-	-	-	-	20	-	-	-	0%	0%
	<b>Dragon - Intermediate</b>	<b>78,233</b>	<b>41,547</b>	<b>18,326</b>	<b>8,772</b>	<b>22,980</b>	<b>23,005</b>	<b>23,200</b>	<b>9,048</b>	<b>32,248</b>	<b>41%</b>	<b>44%</b>
dw 1	NDT3 SBS	19,434	10,495	<b>4,470</b>	2,138	4,753	4,859	7,002	2,820	<b>9,822</b>	51%	56%
dw 2	SBS	29,685	16,030	<b>6,827</b>	3,265	11,290	7,959	6,703	3,733	<b>10,436</b>	35%	33%
mc 1	SBS	9,434	5,094	<b>2,170</b>	1,038	5,822	453	2,036	1,124	<b>3,159</b>	33%	33%
mh	SBS	17,619	9,514	<b>4,052</b>	1,938	1,021	8,650	6,577	1,370	<b>7,947</b>	45%	77%
3 <sub>1</sub>	NDT4F IDF dk	8	1	<b>3</b>	2	-	6	2	-	<b>2</b>	29%	29%
xm <sub>1</sub>	IDF	1,656	199	<b>712</b>	348	14	816	826	-	<b>826</b>	50%	64%
3 <sub>1</sub>	NDT4P IDF dk	8	4	<b>2</b>	1	8	-	-	-	-	0%	0%
xm <sub>1</sub>	IDF	390	210	<b>90</b>	43	73	262	55	-	<b>55</b>	14%	30%
	<b>Eliguk - Intermediate</b>	<b>34,046</b>	<b>20,658</b>	<b>6,550</b>	<b>2,923</b>	<b>1,426</b>	<b>14,747</b>	<b>9,290</b>	<b>8,583</b>	<b>17,873</b>	<b>52%</b>	<b>52%</b>
v 1 <sub>1</sub>	NDT2 ESSFx	780	281	<b>218</b>	70	-	110	671	-	<b>671</b>	86%	86%
xv <sub>1</sub>	NDT3 MS	6,974	3,208	<b>1,813</b>	976	4	1,110	1,153	4,707	<b>5,860</b>	84%	84%
mc <sub>2</sub>	SBPS	25,153	16,601	<b>4,276</b>	1,761	1,422	12,849	7,226	3,656	<b>10,882</b>	43%	43%
mc 2 <sub>2</sub>	SBS	963	520	<b>222</b>	106	-	596	168	199	<b>367</b>	38%	38%
mc 3 <sub>2</sub>	SBS	90	49	<b>21</b>	10	-	34	35	21	<b>56</b>	62%	62%
vp	NDT5 ESSFx	86	-	-	-	-	48	37	-	<b>37</b>	43%	43%
	<b>Euchiniko - Low</b>	<b>54,633</b>	<b>-</b>	<b>5,191</b>	<b>4,911</b>	<b>18,776</b>	<b>17,444</b>	<b>13,541</b>	<b>4,872</b>	<b>18,413</b>	<b>34%</b>	<b>34%</b>
v 1	NDT2 ESSFm	117	-	<b>16</b>	11	82	14	21	-	<b>21</b>	18%	18%

	NDT3											
c	SBPSd	10,497	-	<b>840</b>	735	1,610	3,956	3,266	1,665	<b>4,931</b>	47%	47%
mk	SBPS	16,898	-	<b>1,352</b>	1,183	5,920	5,205	4,884	889	<b>5,773</b>	34%	34%
dk <sub>1</sub>	SBS	609	-	<b>67</b>	67	283	101	120	105	<b>225</b>	37%	37%
dw 2 <sub>1</sub>	SBS	1,948	-	<b>214</b>	214	571	714	570	93	<b>663</b>	34%	34%
mc 2 <sub>1</sub>	SBS	6,215	-	<b>684</b>	684	2,893	1,469	1,324	528	<b>1,852</b>	30%	30%
mc 3	SBS	18,348	-	<b>2,018</b>	2,018	7,416	5,985	3,356	1,592	<b>4,948</b>	27%	27%
	<b>Gerimi - Intermediate</b>	<b>40,049</b>	<b>21,535</b>	<b>9,252</b>	<b>4,395</b>	<b>13,189</b>	<b>5,254</b>	<b>15,808</b>	<b>5,798</b>	<b>21,606</b>	<b>54%</b>	<b>55%</b>
	NDT2											
wk 1 <sub>1</sub>	SBS	511	184	<b>158</b>	46	295	-	216	-	<b>216</b>	42%	42%
	NDT3											
mh	SBS	6,940	3,748	<b>1,596</b>	763	290	1,219	3,986	1,445	<b>5,430</b>	78%	84%
mw <sub>1</sub>	SBS	32,598	17,603	<b>7,498</b>	3,586	12,604	4,034	11,606	4,354	<b>15,960</b>	49%	49%
	<b>Indianpoint - Low</b>	<b>16,756</b>	-	<b>2,679</b>	<b>1,898</b>	<b>6,403</b>	<b>1,204</b>	<b>8,910</b>	<b>239</b>	<b>9,149</b>	<b>55%</b>	<b>96%</b>
	NDT1											
c 3 <sub>1</sub>	ESSFw	68	-	<b>13</b>	13	5	-	54	9	<b>63</b>	93%	82%
cw <sub>1</sub>	ESSFw	5	-	<b>1</b>	1	-	-	1	4	<b>5</b>	100%	100%
k 1 <sub>1</sub>	ESSFw	2,864	-	<b>544</b>	544	883	418	1,490	73	<b>1,563</b>	55%	67%
wk 4 <sub>2</sub>	ICH	2,429	-	<b>413</b>	316	-	-	2,360	69	<b>2,429</b>	100%	100%
	NDT2											
wk 1 <sub>2</sub>	SBS	11,386	-	<b>1,708</b>	1,025	5,516	786	5,001	84	<b>5,084</b>	45%	100%
	NDT5											
cp	ESSFw	5	-	-	-	-	-	5	-	<b>5</b>	100%	100%
	<b>Jack of Clubs - Low</b>	<b>24,324</b>	-	<b>4,479</b>	<b>4,265</b>	<b>3,653</b>	<b>5,548</b>	<b>14,065</b>	<b>1,058</b>	<b>15,123</b>	<b>62%</b>	<b>59%</b>
	NDT1											
c 3 <sub>1</sub>	ESSFw	5,482	-	<b>1,042</b>	1,042	328	422	4,361	371	<b>4,731</b>	86%	81%
cw <sub>1</sub>	ESSFw	489	-	<b>93</b>	93	-	148	304	38	<b>342</b>	70%	100%
k 1	ESSFw	14,788	-	<b>2,810</b>	2,810	2,666	4,214	7,331	577	<b>7,908</b>	53%	53%
	NDT2											
wk 1	SBS	3,564	-	<b>535</b>	321	659	762	2,069	73	<b>2,142</b>	60%	60%
(blank)		2	-	-	-	-	2	-	-	-	0%	0%
	<b>Kluskus - Intermediate</b>	<b>71,098</b>	<b>38,287</b>	<b>15,967</b>	<b>7,979</b>	<b>8,711</b>	<b>11,335</b>	<b>28,035</b>	<b>23,017</b>	<b>51,052</b>	<b>72%</b>	<b>72%</b>
	NDT2											
v 1 <sub>1</sub>	ESSFx	242	87	<b>68</b>	22	-	11	219	12	<b>231</b>	95%	95%
	NDT3											

xv <sub>1</sub>	MS	42,823	19,699	<b>11,134</b>	5,995	3,373	5,793	17,903	15,754	<b>33,656</b>	79%	79%
c <sub>2</sub>	SBPSd	2,134	1,408	<b>363</b>	149	653	255	997	228	<b>1,226</b>	57%	56%
mc <sub>2</sub>	SBPS	25,899	17,093	<b>4,403</b>	1,813	4,685	5,275	8,915	7,024	<b>15,939</b>	62%	62%
<b>Lightning - Low</b>		<b>34,405</b>	-	<b>5,833</b>	<b>5,026</b>	<b>12,977</b>	<b>4,050</b>	<b>15,103</b>	<b>2,276</b>	<b>17,379</b>	<b>51%</b>	<b>63%</b>
c <sub>3<sub>1</sub></sub>	ESFw	3,007	-	<b>571</b>	571	403	85	2,242	276	<b>2,519</b>	84%	84%
cw <sub>1</sub>	ESFw	97	-	<b>18</b>	18	-	2	95	-	<b>95</b>	98%	100%
k <sub>1<sub>1</sub></sub>	ESFw	15,779	-	<b>2,998</b>	2,998	6,217	1,345	7,058	1,159	<b>8,217</b>	52%	57%
wk <sub>1<sub>2</sub></sub>	SBS	13,436	-	<b>2,015</b>	1,209	5,526	2,175	5,539	196	<b>5,735</b>	43%	67%
mw <sub>2</sub>	SBS	2,086	-	<b>229</b>	229	830	442	169	644	<b>813</b>	39%	33%
<b>Marmot - Low</b>		<b>49,157</b>	-	<b>4,359</b>	<b>3,950</b>	<b>24,636</b>	<b>10,573</b>	<b>9,011</b>	<b>4,938</b>	<b>13,949</b>	<b>28%</b>	<b>28%</b>
v <sub>1<sub>1</sub></sub>	ESFm	41	-	<b>6</b>	4	7	34	-	-	-	0%	0%
c <sub>1</sub>	MS xv SBPSd	5,709	-	<b>799</b>	799	3,615	593	828	674	<b>1,501</b>	26%	26%
mc	SBPS	29,205	-	<b>2,336</b>	2,044	12,375	7,998	5,912	2,920	<b>8,833</b>	30%	30%
mk	SBPS	2	-	<b>0</b>	0	2	-	-	0	<b>0</b>	16%	16%
dw <sub>2<sub>1</sub></sub>	SBS	11,496	-	<b>920</b>	805	7,509	1,058	1,771	1,158	<b>2,929</b>	25%	25%
mc <sub>2<sub>1</sub></sub>	SBS	2,110	-	<b>232</b>	232	817	656	453	185	<b>637</b>	30%	33%
<b>Matthew - Intermediate</b>		<b>23,443</b>	<b>6,093</b>	<b>8,176</b>	<b>3,727</b>	<b>6,907</b>	<b>667</b>	<b>12,579</b>	<b>3,290</b>	<b>15,869</b>	<b>68%</b>	<b>68%</b>
c <sub>3<sub>1</sub></sub>	ESFw	4,072	896	<b>1,466</b>	774	60	149	3,263	601	<b>3,864</b>	95%	95%
cw <sub>1</sub>	ESFw	858	189	<b>309</b>	163	-	43	725	90	<b>815</b>	95%	95%
k <sub>1</sub>	ESFw	6,551	1,441	<b>2,358</b>	1,245	1,116	110	4,044	1,281	<b>5,325</b>	81%	81%
wk <sub>4</sub>	ICH	11,891	3,567	<b>4,043</b>	1,546	5,731	360	4,488	1,312	<b>5,800</b>	49%	49%
cp	ESFw	71	-	-	-	-	5	59	6	<b>65</b>	92%	92%
<b>Narcosli - Low</b>		<b>69,456</b>	-	<b>7,696</b>	<b>7,660</b>	<b>24,321</b>	<b>18,064</b>	<b>20,648</b>	<b>6,422</b>	<b>27,070</b>	<b>39%</b>	<b>41%</b>
mk <sub>1</sub>	SBS	2,364	-	<b>189</b>	165	1,432	139	501	292	<b>792</b>	34%	34%
dw <sub>1<sub>1</sub></sub>	SBS	746	-	<b>82</b>	82	107	255	374	10	<b>384</b>	51%	77%

dw 2 <sub>1</sub>	SBS	41,372	-	<b>4,551</b>	4,551	13,781	10,394	13,225	3,972	<b>17,196</b>	42%	45%
mc 2	SBS	11,062	-	<b>1,217</b>	1,217	7,387	712	1,978	985	<b>2,963</b>	27%	27%
mh <sub>2</sub>	SBS	12,305	-	<b>1,354</b>	1,354	1,409	5,844	3,888	1,164	<b>5,052</b>	41%	63%
xm <sub>2</sub>	NDT4F IDF	1,148	-	<b>253</b>	241	32	494	622	-	<b>622</b>	54%	83%
xm <sub>2</sub>	NDT4P IDF	459	-	<b>51</b>	51	172	226	60	-	<b>60</b>	13%	39%
<b>Pan - Intermediate</b>		<b>56,716</b>	<b>27,732</b>	<b>13,366</b>	<b>6,349</b>	<b>4,430</b>	<b>19,491</b>	<b>18,432</b>	<b>14,363</b>	<b>32,795</b>	<b>58%</b>	<b>59%</b>
v 1	NDT2 ESSFx	8,712	3,136	<b>2,439</b>	784	3	2,359	5,941	409	<b>6,350</b>	73%	73%
mc <sub>1</sub>	NDT3 MS xv SBPS	32,073	14,754	<b>8,339</b>	4,490	491	9,033	9,611	12,938	<b>22,549</b>	70%	70%
mc 2 <sub>1</sub>	SBS	14,438	9,529	<b>2,454</b>	1,011	3,935	7,307	2,272	923	<b>3,195</b>	22%	23%
mc 3	SBS	577	312	<b>133</b>	64	0	260	227	90	<b>317</b>	55%	56%
vp	NDT5 ESSFx	2	1	<b>0</b>	0	-	-	-	2	<b>2</b>	100%	100%
<b>Pantage - Intermediate</b>		<b>73,821</b>	<b>43,885</b>	<b>14,942</b>	<b>6,727</b>	<b>41,778</b>	<b>15,835</b>	<b>10,016</b>	<b>6,193</b>	<b>16,209</b>	<b>22%</b>	<b>21%</b>
v 1 <sub>1</sub>	NDT2 ESSFm	659	237	<b>184</b>	59	452	162	45	-	<b>45</b>	7%	7%
c	NDT3 SBPSd	7,254	4,788	<b>1,233</b>	508	3,341	2,447	1,242	224	<b>1,466</b>	20%	20%
mk	SBS	27,250	17,985	<b>4,632</b>	1,907	16,411	6,802	2,834	1,203	<b>4,037</b>	15%	15%
dw 1 <sub>2</sub>	SBS	2,779	1,500	<b>639</b>	306	546	623	655	955	<b>1,610</b>	58%	58%
dw 2 <sub>2</sub>	SBS	24,790	13,387	<b>5,702</b>	2,727	14,088	3,632	3,931	3,139	<b>7,070</b>	29%	28%
mc 2 <sub>1</sub>	SBS	11,090	5,988	<b>2,551</b>	1,220	6,941	2,169	1,308	672	<b>1,980</b>	18%	18%
<b>Pelican - Intermediate</b>		<b>71,857</b>	<b>45,102</b>	<b>13,367</b>	<b>5,784</b>	<b>28,600</b>	<b>28,399</b>	<b>11,122</b>	<b>3,735</b>	<b>14,858</b>	<b>21%</b>	<b>20%</b>
v 1 <sub>1</sub>	NDT2 ESSFm	265	95	<b>74</b>	24	158	-	107	-	<b>107</b>	41%	41%
c	NDT3 SBPSd	47,490	31,344	<b>8,073</b>	3,324	17,142	21,377	6,837	2,134	<b>8,972</b>	19%	19%
mk	SBS	5,396	3,562	<b>917</b>	378	2,581	2,154	497	164	<b>661</b>	12%	12%
dw 2	SBS	10,674	5,764	<b>2,455</b>	1,174	4,085	3,361	2,654	573	<b>3,227</b>	30%	30%
mc 2 <sub>1</sub>	SBS	6,870	3,710	<b>1,580</b>	756	4,127	1,253	781	710	<b>1,491</b>	22%	22%
mc 3 <sub>1</sub>	SBS	697	377	<b>160</b>	77	296	237	145	19	<b>164</b>	24%	24%

mw <sub>1</sub>	SBS	465	251	107	51	212	18	101	134	235	51%	51%
<b>Ramsey - Low</b>		<b>67,548</b>	-	<b>6,623</b>	<b>6,224</b>	<b>39,540</b>	<b>15,489</b>	<b>10,719</b>	<b>1,800</b>	<b>12,519</b>	<b>19%</b>	<b>18%</b>
NDT3												
c <sub>1</sub>	MS xv SBPSd	12,922	-	1,809	1,809	9,173	900	2,543	306	2,849	22%	22%
mk <sub>1</sub>	SBPS	4,311	-	345	302	2,130	1,538	493	149	642	15%	15%
dw 2	SBS	35,531	-	2,842	2,487	21,948	7,129	5,620	833	6,453	18%	18%
mc 2 <sub>1</sub>	SBS	14,181	-	1,560	1,560	5,918	5,843	1,957	463	2,419	17%	16%
	SBS	590	-	65	65	357	77	106	49	155	26%	26%
NDT4F												
3 <sub>1</sub>	IDF dk	1	-	0	0	-	1	-	-	-	0%	0%
NDT4P												
3 <sub>1</sub>	IDF dk	13	-	1	1	13	-	-	-	-	0%	0%
<b>Sandy - Low</b>		<b>14,989</b>	-	<b>2,647</b>	<b>2,256</b>	<b>104</b>	<b>2,094</b>	<b>8,157</b>	<b>4,634</b>	<b>12,791</b>	<b>85%</b>	<b>86%</b>
NDT1												
c 3 <sub>1</sub>	ESSFw	1,777	-	338	338	-	-	1,148	629	1,777	100%	100%
cw <sub>1</sub>	ESSFw	376	-	71	71	-	-	159	217	376	100%	100%
k 1 <sub>1</sub>	ESSFw	3,023	-	574	574	6	48	2,456	512	2,968	98%	98%
wk 4	ICH	9,789	-	1,664	1,273	97	2,046	4,387	3,258	7,645	78%	78%
NDT5												
cp	ESSFw	24	-	-	-	-	-	7	17	24	100%	100%
<b>Snaking - Intermediate</b>		<b>60,785</b>	<b>37,838</b>	<b>11,470</b>	<b>5,008</b>	<b>31,932</b>	<b>16,339</b>	<b>10,200</b>	<b>2,314</b>	<b>12,514</b>	<b>21%</b>	<b>21%</b>
NDT2												
v 1 <sub>1</sub>	ESSFm	91	33	25	8	73	8	9	-	9	10%	10%
NDT3												
c	SBPSd	20,739	13,688	3,526	1,452	7,780	9,187	3,556	215	3,771	18%	18%
mk	SBPS	21,181	13,980	3,601	1,483	11,934	4,841	3,714	693	4,407	21%	21%
mc 2 <sub>1</sub>	SBS	18,774	10,138	4,318	2,065	12,145	2,302	2,921	1,406	4,327	23%	23%
<b>Swift - Low</b>		<b>35,059</b>	-	<b>6,364</b>	<b>5,950</b>	<b>12,267</b>	<b>1,954</b>	<b>18,349</b>	<b>2,488</b>	<b>20,837</b>	<b>59%</b>	<b>68%</b>
NDT1												
c 3 <sub>1</sub>	ESSFw	9,044	-	1,718	1,718	893	209	6,997	946	7,943	88%	92%
cw <sub>1</sub>	ESSFw	1,551	-	295	295	6	77	1,454	14	1,468	95%	100%
k 1	ESSFw	17,451	-	3,316	3,316	7,790	706	7,554	1,402	8,956	51%	55%
NDT2												
wk 1	SBS	6,899	-	1,035	621	3,577	908	2,288	126	2,414	35%	49%
NDT5												

cp	ESSFw	113	-	-	-	-	56	57	-	57	51%	100%
<b>Tibbles - Low</b>		<b>64,989</b>	-	<b>6,352</b>	<b>5,966</b>	<b>34,513</b>	<b>13,802</b>	<b>12,831</b>	<b>3,844</b>	<b>16,674</b>	<b>26%</b>	<b>25%</b>
NDT3												
	MS xv	11,953	-	<b>1,673</b>	1,673	4,881	3,697	2,832	543	<b>3,375</b>	28%	28%
c	SBPSd	15,384	-	<b>1,231</b>	1,077	6,724	3,829	3,983	847	<b>4,831</b>	31%	31%
mk	SBPS	23,141	-	<b>1,851</b>	1,620	14,094	4,159	3,797	1,091	<b>4,888</b>	21%	21%
mc 2	SBS	14,511	-	<b>1,596</b>	1,596	8,814	2,117	2,218	1,363	<b>3,580</b>	25%	25%
<b>Toil - Low</b>		<b>49,434</b>	-	<b>6,817</b>	<b>6,799</b>	<b>9,589</b>	<b>4,641</b>	<b>14,511</b>	<b>20,693</b>	<b>35,205</b>	<b>71%</b>	<b>71%</b>
NDT3												
xv1	MS	47,700	-	<b>6,678</b>	6,678	8,995	4,250	14,297	20,158	<b>34,455</b>	72%	72%
mc1	SBPS	1,734	-	<b>139</b>	121	594	390	215	535	<b>750</b>	43%	43%
<b>Twan - High</b>		<b>28,073</b>	<b>9,087</b>	<b>11,688</b>	<b>5,597</b>	<b>7,762</b>	<b>14,086</b>	<b>5,299</b>	<b>925</b>	<b>6,224</b>	<b>22%</b>	<b>23%</b>
NDT3												
c	SBPSd	76	38	<b>19</b>	8	59	18	-	-	-	0%	0%
dw 2	SBS	12,369	4,947	<b>4,205</b>	1,979	3,589	6,340	1,611	828	<b>2,439</b>	20%	20%
NDT4F												
3 <sub>1</sub>	IDF dk	4,472	402	<b>2,907</b>	1,431	475	2,069	1,928	-	<b>1,928</b>	43%	43%
xm <sub>1</sub>	IDF	2,464	222	<b>1,601</b>	788	62	1,485	917	-	<b>917</b>	37%	50%
NDT4P												
3 <sub>1</sub>	IDF dk	7,811	3,124	<b>2,656</b>	1,250	3,492	3,510	711	96	<b>808</b>	10%	11%
xm <sub>1</sub>	IDF	882	353	<b>300</b>	141	85	664	133	-	<b>133</b>	15%	29%
<b>Umiti - Intermediate</b>		<b>75,859</b>	<b>37,242</b>	<b>19,042</b>	<b>8,490</b>	<b>21,242</b>	<b>33,595</b>	<b>13,610</b>	<b>7,412</b>	<b>21,022</b>	<b>28%</b>	<b>34%</b>
NDT1												
c 3 <sub>1</sub>	ESSFw	472	104	<b>170</b>	90	173	-	248	50	<b>298</b>	63%	78%
k 1 <sub>1</sub>	ESSFw	4,362	960	<b>1,570</b>	829	1,842	485	1,989	47	<b>2,035</b>	47%	46%
NDT2												
wk 1	SBS	12,082	4,349	<b>3,745</b>	1,087	5,395	4,003	2,526	158	<b>2,684</b>	22%	21%
NDT3												
dw 1 <sub>2</sub>	SBS	17,583	9,495	<b>4,044</b>	1,934	3,692	8,074	4,129	1,688	<b>5,817</b>	33%	50%
mh	SBS	5,578	3,012	<b>1,283</b>	614	281	3,187	1,379	731	<b>2,110</b>	38%	66%
mw <sub>2</sub>	SBS	35,782	19,322	<b>8,230</b>	3,936	9,858	17,846	3,338	4,739	<b>8,077</b>	23%	24%
<b>Victoria - High</b>		<b>59,395</b>	<b>19,270</b>	<b>24,229</b>	<b>9,811</b>	<b>28,508</b>	<b>4,672</b>	<b>17,739</b>	<b>8,476</b>	<b>26,215</b>	<b>44%</b>	<b>34%</b>
NDT1												
c 3 <sub>1</sub>	ESSFw	1,407	239	<b>760</b>	394	116	-	1,024	267	<b>1,291</b>	92%	100%
cw <sub>1</sub>	ESSFw	102	17	<b>55</b>	28	-	-	91	10	<b>102</b>	100%	100%

k 1 <sub>1</sub>	ESSFw	6,259	1,064	<b>3,380</b>	1,752	2,367	170	3,447	274	<b>3,722</b>	59%	100%
wk 1	NDT2 SBS	20,727	5,596	<b>9,534</b>	2,695	10,350	1,387	8,939	51	<b>8,990</b>	43%	55%
mw	NDT3 SBS	30,883	12,353	<b>10,500</b>	4,941	15,675	3,116	4,222	7,871	<b>12,093</b>	39%	34%
cp	NDT5 ESSFw	18	-	-	-	-	-	17	1	<b>18</b>	100%	-
<b>Wentworth - Low</b>		<b>60,566</b>	-	<b>5,747</b>	<b>5,297</b>	<b>31,881</b>	<b>8,981</b>	<b>16,305</b>	<b>3,399</b>	<b>19,704</b>	<b>33%</b>	<b>32%</b>
c	NDT3 MS xv SBPSd	14,513	-	<b>2,032</b>	2,032	8,555	1,964	3,517	477	<b>3,994</b>	28%	28%
mk <sub>1</sub>	SBPS	28,659	-	<b>2,293</b>	2,006	13,145	4,712	9,055	1,747	<b>10,802</b>	38%	37%
mc 2 <sub>1</sub>	SBS	16,368	-	<b>1,309</b>	1,146	9,708	2,027	3,567	1,067	<b>4,634</b>	28%	28%
<b>Whittier - Low</b>		<b>56,224</b>	-	<b>6,107</b>	<b>6,081</b>	<b>20,285</b>	<b>13,689</b>	<b>16,390</b>	<b>5,860</b>	<b>22,250</b>	<b>40%</b>	<b>42%</b>
mk <sub>2</sub>	NDT3 SBPS	2,581	-	<b>207</b>	181	1,819	220	334	209	<b>543</b>	21%	21%
dw 1 <sub>1</sub>	SBS	29,477	-	<b>3,243</b>	3,243	6,375	9,227	10,847	3,028	<b>13,875</b>	47%	53%
dw 2 <sub>2</sub>	SBS	18,771	-	<b>2,065</b>	2,065	11,706	2,012	3,021	2,032	<b>5,054</b>	27%	27%
mc 2 <sub>2</sub>	SBS	472	-	<b>52</b>	52	62	220	173	17	<b>190</b>	40%	40%
mh <sub>1</sub>	SBS	4,922	-	<b>541</b>	541	324	2,010	2,016	574	<b>2,589</b>	53%	63%
<b>Willow - Low</b>		<b>44,858</b>	-	<b>7,661</b>	<b>6,370</b>	<b>20,030</b>	<b>5,801</b>	<b>17,616</b>	<b>1,411</b>	<b>19,027</b>	<b>42%</b>	<b>47%</b>
c 3 <sub>1</sub>	NDT1 ESSFw	2,382	-	<b>453</b>	453	398	37	1,885	62	<b>1,947</b>	82%	82%
k 1 <sub>1</sub>	ESSFw	20,946	-	<b>3,980</b>	3,980	10,179	636	9,215	916	<b>10,130</b>	48%	51%
wk 1	NDT2 SBS	21,525	-	<b>3,229</b>	1,937	9,453	5,125	6,514	433	<b>6,947</b>	32%	35%
cp	NDT5 ESSFw	3	-	-	-	-	1	2	-	<b>2</b>	61%	61%
(blank)		2	-	-	-	-	2	-	-	-	0%	
<b>Grand Total</b>		<b>1,829,876</b>	<b>498,583</b>	<b>350,848</b>	<b>210,119</b>	<b>674,164</b>	<b>391,490</b>	<b>525,126</b>	<b>239,096</b>	<b>764,222</b>	<b>42%</b>	<b>43%</b>