

# **Nisga'a Public Lands**

## **2020-2025 Forest Development Plan for Timber Harvesting Licensees**

**July 6, 2020 to June 30, 2025**



**PUBLIC REVIEW AND COMMENT PERIOD**

**May 22 to June 22, 2020**

### **Prepared by:**

Nisga'a Lisims Government  
Directorate of Lands and Resources

Date: May 22, 2020



## Executive Summary

This Forest Development Plan (“FDP”) provides forest management direction and specifies forest practices that are consistent with the *Nisga’a Final Agreement*, the *Nisga’a Forest Act*, *A Land Use Plan for Nisga’a Lands* (2002) (the “*Land Use Plan*”), previous public input, and other applicable natural resource plans, reports, orders and guidance. The FDP document generally follows the format and content of previous FDP documents.

The FDP provides Nisga'a citizens, the general public, government resource agencies, and private interests with information on the location and scheduling of timber harvesting, road construction, road maintenance, road deactivation and other related activities that may take place on Nisga'a Public Lands from July 2020 to July 2025 under timber harvesting licences issued pursuant to the *Nisga’a Forest Act*.

The FDP outlines forest practices to conserve and manage forest resources and features such as timber, biodiversity, soil, water, fisheries, riparian areas, wildlife, visuals, cultural and heritage uses, recreation, and botanical forest products.

The FDP assumes an Annual Harvest Level of 130,000 m<sup>3</sup> per year. It covers 41 cutblocks, with an average size of 35.8 ha. The total harvest area is 1,470 ha and the total estimated volume of harvestable timber is 705,830 m<sup>3</sup> or an average of 141,166 m<sup>3</sup> per year. The additional volume above the Annual Harvest Level has been provided to accommodate cutblocks lost or delayed due to merchantability, access, log market, and land use constraints.

The FDP anticipates the construction of 44.9 km of roads, mostly spur roads, and the maintenance of 129 km of roads, including branch roads and mainlines. This equates to approximately 9 km of new road construction and 26 km of maintenance each year.



<b>Table of Contents</b>		<b>Page</b>
Executive Summary		2
1.0	Purpose	5
1.1	Background	5
1.2	Management Philosophy	5
1.3	Legislative Framework for Forest Development Plan	6
1.4	Strategic Plans, Reports, and Assessments	6
2.0	Forest Development Plan Scope of Work	6
2.1	Building on Previous Planning Work	7
2.2	Undertaking New Planning Work	7
2.3	Forest Development Plan Guiding Parameters for Cutblock Selection	7
2.4	Forest Development Plan in Numbers	9
2.5	Forest Development Plan Five Year Cutblock and Road Activity	10
2.6	Forest Development Plan Timber Profile by Species	13
2.7	Areas with Future Development Potential	14
2.7.1	Kwinamuck Operating Area	14
2.7.2	Monkley Bay Log Dump Operating Area	14
2.7.3	Burton Operating Area	15
2.8	Higher Level Plan Integration	15
3.0	Forest Practices to Conserve and Manage Forest Resources	15
3.1	Forest Health	15
3.1.1	Pests and Pathogens	16
3.1.1.1	Spruce Bark Beetle	16
3.1.1.2	Mountain Pine Beetle	16
3.1.1.3	White Pine Weevil	17
3.1.1.4	Red Band Needle Rust	17
3.1.1.5	Hemlock Dwarf Mistletoe	17
3.1.1.6	Porcupine	17
3.1.1.7	Snowshoe Hare	17
3.1.1.8	Meadow Vole	17
3.1.1.9	Root Rot Pathogens	18
3.1.1.10	Other Pests and Pathogens	18
3.1.2	Fire Preparedness Management	18
3.1.3	Windthrow	19



3.1.4	Reforestation	19
3.2	Water Resources	20
3.3	Fisheries	21
3.4	Riparian Management	21
3.5	Wildlife	22
3.5.1	Moose	23
3.5.2	Mountain Goat	23
3.5.3	Grizzly Bear	24
3.5.4	Fisher, Marten and Other Furbearers	24
3.5.5	Coastal Tailed Frog	25
3.5.6	Great Blue Heron, Marbled Murrelet, Keen's Long-eared Myotis and Northern Goshawk	25
3.5.7	Wolverine	26
3.6	Botanical Forest Products	26
3.7	Biological Diversity	27
3.8	Soils and Terrain Stability	28
3.9	Timber Salvage	29
3.10	Cultural Heritage Resources and Archaeology	29
3.11	Recreation	30
3.11.1	Designated Recreation Sites	31
4.0	Forest Development Plan Public Review and Comment Schedule	32
4.1	Forest Development Plan Review and Comment Summary	32
5.0	Appendices	33



## 1.0 PURPOSE

This Forest Development Plan (FDP) has been prepared under section 19(1) of the *Nisga'a Forest Act*.

The FDP provides Nisga'a citizens, the general public, government resource agencies, and private interests with information on the location and scheduling of timber harvesting, road construction, road maintenance, road deactivation and other related activities on Nisga'a Public Lands for the five-year period from July 2020 to July 2025.

The FDP outlines forest practices to conserve and manage forest resources and features such as timber, biodiversity, soil, water, fisheries and riparian areas, wildlife, cultural and heritage uses, recreation and tourism, and botanical forest products.

The FDP contains a text document and a series of 1:20,000 and 1:50,000 scale maps.

### 1.1 Background

Since 2005 FDP's have been submitted to the Director of Lands and Resources (the "Director") for approval under section 19(1.1) of the *Nisga'a Forest Act*. Between 2005 and 2020 commercial forest operations on Nisga'a Public Lands were conducted through Lisims Forest Resources ("LFR"), the holder of the Nisga'a Public Lands Licence ("NPLL"). The LFR NPLL expired on March 31, 2020.

Contained within this FDP are cutblocks and roads that were approved under and have been carried over from the LFR NPLL FDP. These are shown as *approved* within this FDP. Other cutblocks and roads are completely new or significantly revised and are shown as *proposed* on the associated FDP maps.

### 1.2 Management Philosophy

Management of the forest resources on Nisga'a Public Lands will be to the standards required by the *Nisga'a Forest Act*. This FDP strives to meet the appropriate balance of environmental, social and economic forest values. Timber harvesting will remain focused on mature stands and old growth. The transition to harvesting second growth forest stands is expected to be approximately 10 years away. When planning timber harvesting, attention will be given to values such as water quality and quantity, visual sensitivity, old growth retention, recreation, forest health, wildlife habitat, community water supply, local employment, educational opportunities, safety, and environmental protection.

Regular public involvement and feedback is necessary to ensure the appropriate balance of values is maintained. All plans and information supporting the FDP will be available to the public at the Nisga'a Lisims Government ("NLG") administration office. When possible, NLG will work with timber harvesting licensees to host public open houses in Nisga'a communities to solicit input from Nisga'a citizens, to improve communications, and to inform citizens about ongoing forest management activities.



To maintain and enhance public involvement, the FDP will be amended annually to show the previous year's activity, to show an additional year of harvest blocks and road construction, to update reforestation status, to improve the content of the plan overall, and to show continuing commitment to responsible stewardship of forest resources on Nisga'a Public Lands.

### 1.3 Legislative Framework for Forest Development Planning

The Nisga'a Final Agreement and the *Nisga'a Forest Act* are the primary authority and legislation that govern forest management on Nisga'a Lands. This FDP is an operational plan which applies to timber resource management on Nisga'a Public Lands during the period July 6, 2020 – June 30, 2025. Part 4, sections 19-24 of the *Nisga'a Forest Act* set out the primary legislative requirements that pertain to planning for forest harvesting on Nisga'a Public Lands.

#### ***Nisga'a Final Agreement***

- Chapter 5 and, where applicable, Appendix "H"

#### ***Nisga'a Forest Act***

- Sec. 19(1) – requirement for the FDP: *"The director must prepare and give effect to a forest development plan that meets the requirements of this Part before timber harvesting is authorized under a timber harvesting licence or timber harvesting contract unless, in the opinion of the director, removing the timber immediately from an area is necessary to ensure responsible forest resource stewardship on that area."*
- Sec. 20 – term of the FDP: *"A forest development plan must address a period of at least five years unless the director determines that a shorter period of time is appropriate."*

### 1.4 Strategic Plans, Reports and Assessments

The *Land Use Plan* establishes forest management criteria that this FDP must adhere to. Variances from requirements within that *Plan* can only be granted by the Nisga'a Lisims Government Executive.

The FDP gives guidance and direction to operational plans such as Site Plans that prescribe specific practices to achieve management objectives and forest stewardship for each cutblock. Where possible, best management practices (BMP's) will be integrated into the earliest stages of cutblock and road planning. BMP's may include additional requirements to protect specific resource values or specified in higher level plans.



## 2.0 FOREST DEVELOPMENT PLAN SCOPE OF WORK

### 2.1 Building on Previous Planning Work

Part of the planning work entailed by this FDP will involve building on work previously performed in relation to the LFR NPLL. Activities to be undertaken include the following:

- Review the *Nisga'a Final Agreement*, the *Nisga'a Forest Act*, the *Land Use Plan*, and the recently expired LFR NPLL and accompanying FDP
- Check the existing status of cutblocks and roads previously approved
- Check the accuracy of mapping updates from past operations
- Review currently available land information for applicability to this FDP
- Identify cutblocks which have been approved and carried from plan to plan
- Review cutblocks which have been planned and/or engineered but not harvested for various reasons

### 2.2 Undertaking New Planning Work

Part of the planning work entailed by this FDP will involve undertaking new work. Activities to be undertaken include the following:

- Analyze forest cover and contour maps, and terrain, aerial and ortho photography
- Collect data from aerial and ground reconnaissance
- Develop mapping to show the forested area suitable for sustainable management
- Identify feasible cutblocks on already built and active road systems
- Conduct field work to verify new cutblocks
- Review and update planned forest management objectives and forest practices
- Establish the following 9 operational areas, listed from the north: Kwinamuck, Nass Valley, Tseax, Ksedin, West Nass, Nass Bottomlands, Xnukw, Ishkheenickh, and Burton (These areas are intended to facilitate operational decisions and analysis, and will be based on existing access to the forest resource, traditional use, biogeoclimatic zone characteristics, interior vs coastal features, etc. Note that the establishment of these 9 areas will not constitute a designation by the Director under section 7(2) of the *Nisga'a Forest Act*.)

### 2.3 Forest Development Plan Guiding Parameters for Cutblock Selection

To facilitate the review and approval of this FDP, 1:20,000 maps have been produced that show the *Land Use Plan* values and the Nisga'a forest resources. Cutblocks have been evaluated based on the following parameters:

- **Location:** coastal vs interior; elevation; slope; access; site productivity



- **Stand Characteristics:** species composition; volume; density; age
- **Commercial Characteristics:** sawlog vs pulp content; presence of non-timber values
- **Harvest Method and Season of Harvest:** ground versus cable; winter versus summer
- **Harvest System:** clear felling; clear felling with reserves; partial cutting; uneven management; single tree selection; ecosystem based
- **Market Flexibility:** need for a diverse portfolio of ready-to-harvest cutblocks to meet current and forecast market demand
- **Financial:** desirability of reducing the cost of development by capitalizing on existing access infrastructure, and incorporating information from previous plans, engineering, studies, and harvesting into plans for new cutblocks and roads
- **Higher Level Plans:** need to observe all *Land Use Plan* requirements
- **Landscape Level Assessments:** need to mitigate unwanted impacts on seral stage distribution, water quantity and quality, terrain stability, and designated species and species at risk habitat
- **Site Level Assessments:** need to accommodate landscape level assessment guidance, as necessary

The annual harvest level (“AAC”) for Nisga’a Lands established under section 8 of the *Nisga’a Forest Act* is expected to remain at 130,000 m<sup>3</sup>. This FDP therefore assumes an AAC of 130,000 m<sup>3</sup>. Additional volume is provided for within the FDP to provide flexibility of operations based on market conditions and other constraints.

Nisga’a Public Lands have accumulated a significant amount of undercut. Undercut represents unharvested AAC from previous years. This FDP does not anticipate using any of the accumulated undercut.



## 2.4 Forest Development Plan in Numbers

Figure 1. FDP annual timber harvest volume.

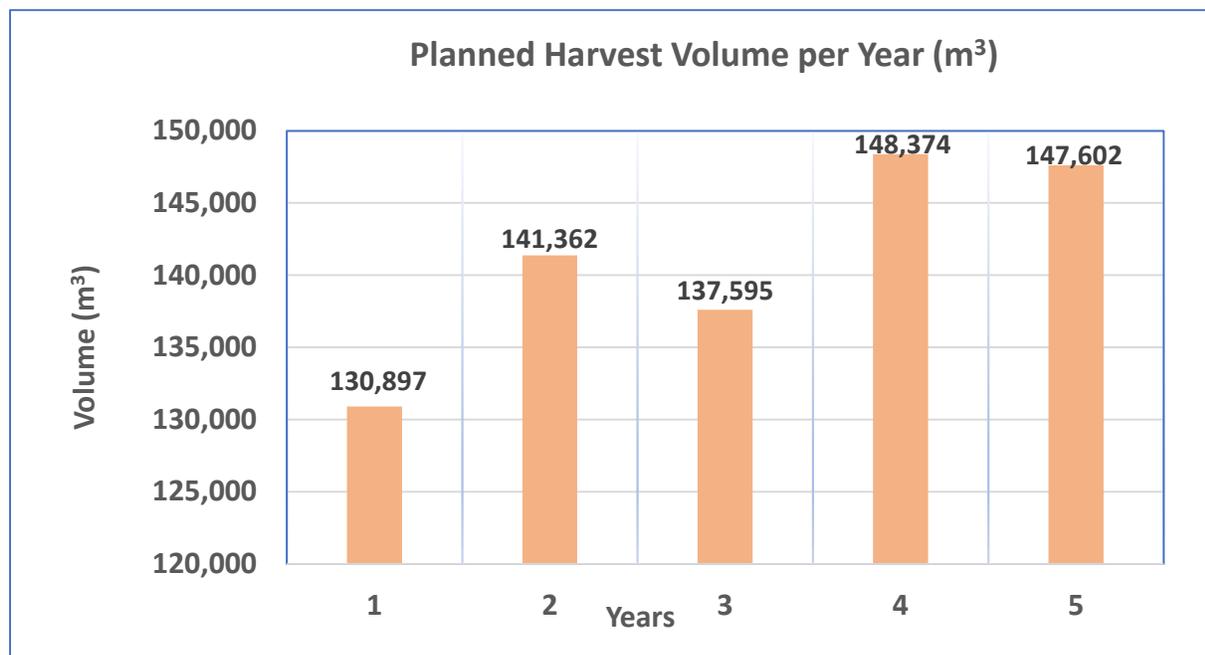


Figure 2. FDP annual timber harvest area.

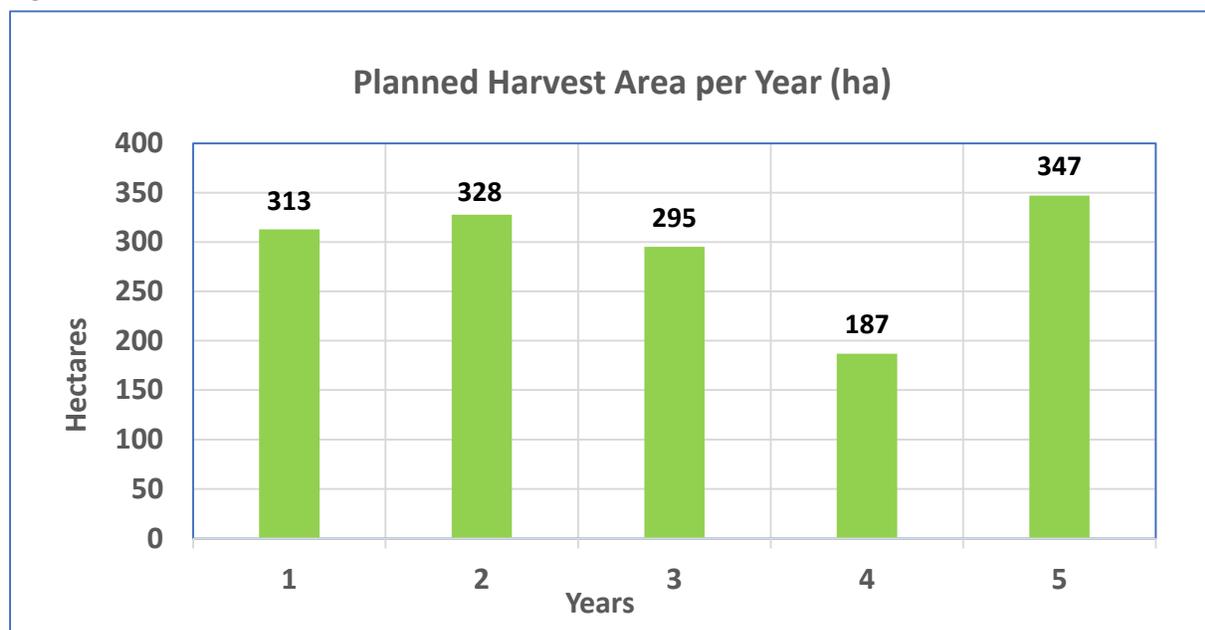
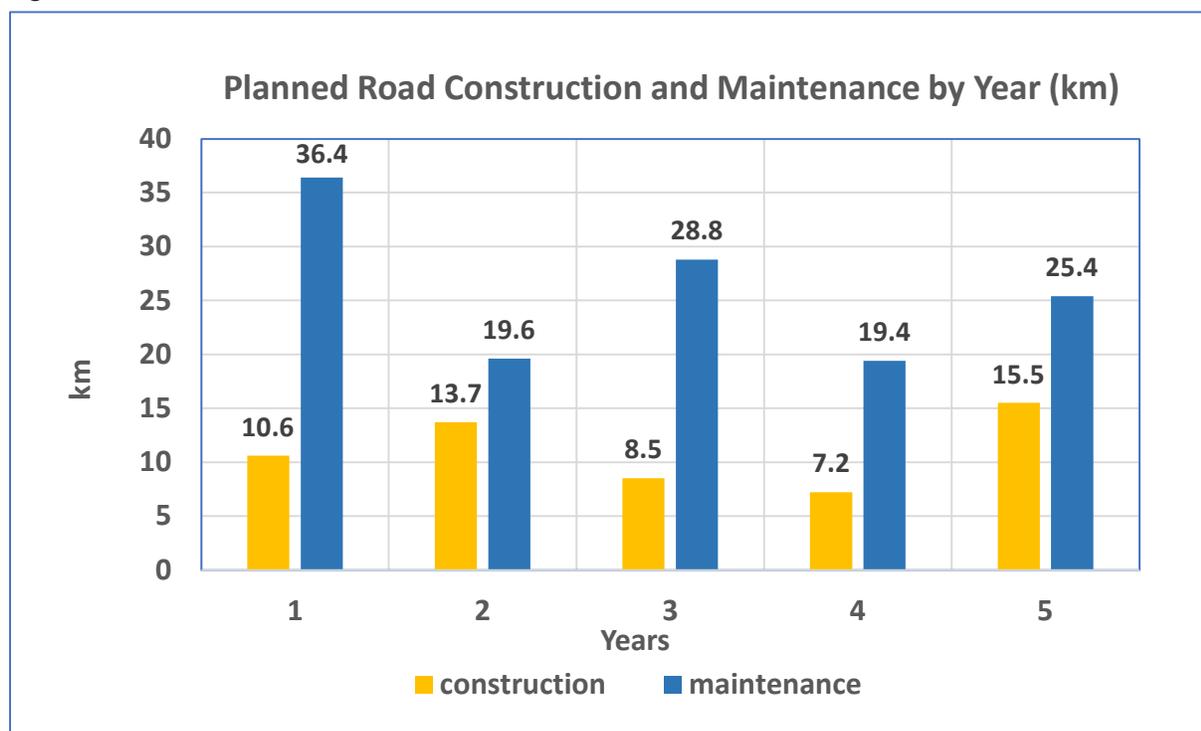




Figure 3. FDP annual road construction and road maintenance.



## 2.5 Forest Development Plan Five Year Cutblock and Road Activity

The following tables show the consolidated annual harvest and road access work provided for in this FDP.

### Year 1: 2020 / 2021

Year 1						
Block ID	Operating Area	Cutblock Information <sup>1</sup>			Access Roads <sup>2</sup>	
		Method Cable/Ground	Area (ha)	Volume (m <sup>3</sup> )	Construction Length (km)	Maintenance Length (km)
ANU606	West Nass	C/GBS	20.9	10,955	1.7	4.2
DLK506	Nass Valley	GBS	30.1	10,665	0.0	6.8
DLK800	Tseax	GBS	24.7	10,703	1.3	0.3
KSD514	Ksedin	C/GBS	27.9	12,162	1.8	7.6
KSD515	Ksedin	C/GBS	29.2	16,760	0.0	2.2
KSD525	Ksedin	C/GBS	18.4	8,494	1.1	2.0
KSD611	Ksedin	GBS/C	86.5	38,118	2.9	2.8
KWT001	Kwinamuck	GBS	24.6	7,435	1.0	1.8
KWT003	Kwinamuck	GBS	50.5	15,605	0.8	8.7
		<b>Totals</b>	<b>312.8</b>	<b>130,897</b>	<b>10.6</b>	<b>36.4</b>

<sup>1, 2</sup> Please refer to Appendices A and B for more details.



The selection of cutblocks and roads for year 1 (2020) is driven by the current status of block development (ANU606, KSD514, KSD515, KWT001, KWT003, DLK800), completed engineering (DLK506, KWT002), and the current forest engineering (KSD525, KSD611, NAS150).

**Year 2: 2021 / 2022**

Year 2						
Block ID	Operating Area	Cutblock Information <sup>1</sup>			Access Roads <sup>2</sup>	
		Method Cable/Ground	Area (ha)	Volume (m <sup>3</sup> )	Construction Length (km)	Maintenance Length (km)
DLK201	Tseax	GBS/C	60.2	23,280	2.7	7.8
DLK204	Tseax	GBS/C	43.3	18,992	3.5	0.0
DLK509	Nass Valley	GBS	25.7	11,148	0.7	0.6
DLK510	Nass Valley	GBS	13.4	5,921	0.7	3.1
KWT002	Nass Valley	GBS	11.2	4,273	0.0	1.7
KWT004	Kwinamuck	C/GBS	86.4	26,484	3.1	0.8
NAS150	West Nass	C/GBS	61.6	36,273	2.3	4.0
NAS203	West Nass	C/GBS	25.6	14,991	0.7	1.6
		<b>Totals</b>	<b>327.5</b>	<b>141,362</b>	<b>13.7</b>	<b>19.6</b>

<sup>1,2</sup> Please refer to Appendices A and B for more details.

The cutblocks selected for year 2 (2021) include partially engineered cutblocks KWT002 and NAS150. The remaining cutblocks are anticipated to be engineered and submitted for approval in 2020. The goal is to complete engineering and approvals one year prior to harvesting.

- **Year 3: 2022 / 2023**

Year 3						
Block ID	Operating Area	Cutblock Information <sup>1</sup>			Access Roads <sup>2</sup>	
		Method Cable/Ground	Area (ha)	Volume (m <sup>3</sup> )	Construction Length (km)	Maintenance Length (km)
ANU701	West Nass	C/GBS	30.7	13,902	2.9	10.4
CAN001	Kwinamuck	C/GBS	33.6	17,131	0.0	7.6
CAN002	Kwinamuck	C/GBS	39.4	21,134	1.2	0.9
DLK206	Tseax	GBS/C	44.2	20,849	0.0	1.6
DSK101	West Nass	GBS	15.0	6,462	0.0	1.3
DSK103	West Nass	C/GBS	53.5	33,977	0.0	1.6
DSK104	West Nass	GBS/C	11.6	5,301	1.3	2.1
KWT005	Kwinamuck	GBS	67.3	18,839	3.1	3.3
		<b>Totals:</b>	<b>295.3</b>	<b>137,595</b>	<b>8.5</b>	<b>28.8</b>

<sup>1,2</sup> Please refer to Appendices A and B for more details.



#### Year 4: 2023 / 2024

Year 4						
Block ID	Operating Area	Cutblock Information <sup>1</sup>			Access Roads <sup>2</sup>	
		Method Cable/Ground	Area (ha)	Volume (m <sup>3</sup> )	Construction Length (km)	Maintenance Length (km)
ANU751	West Nass	C/GBS	47.9	41,753	2.0	2.9
DLK007	Nass Valley	GBS	43.8	18,914	1.1	5.9
DLK900	Tseax	C/GBS	25.8	9,899	0.0	0.0
ISH501	Ishkheenickh	C/GBS	15.7	7,011	0.0	0.4
ISH510	Ishkheenickh	C/GBS	52.0	29,074	1.7	4.7
ISH511	Ishkheenickh	C/GBS	34.2	19,449	1.2	3.7
ISH602	Ishkheenickh	C/GBS	37.8	22,274	1.2	1.8
		<b>Totals:</b>	<b>187.6</b>	<b>148,374</b>	<b>7.2</b>	<b>19.4</b>

<sup>1, 2</sup> Please refer to Appendices A and B for more details.

#### Year 5: 2024 / 2025

Year 5						
Block ID	Operating Area	Cutblock Information <sup>1</sup>			Access Roads <sup>2</sup>	
		Method Cable/Ground	Area (ha)	Volume (m <sup>3</sup> )	Construction Length (km)	Maintenance Length (km)
ANU702	West Nass	C/GBS	43.2	24,534	3.6	0.0
DLK106	Tseax	C/GBS	53.1	23,810	1.9	6.8
DLK170	Tseax	C/GBS	18.9	9,300	0.6	3.2
DLK180	Tseax	C/GBS	19.5	8,424	0.5	1.8
DLK508	Nass Valley	GBS	54.0	21,013	2.6	5.0
DLK708	Nass Valley	GBS	32.6	11,128	0.9	0.8
KSD700	Ksedin	C/GBS	26.5	12,239	1.0	3.8
KSD701	Ksedin	C/GBS	67.5	27,268	1.8	3.4
VET309	Tseax	GBS/C	31.6	9,885	2.6	0.6
		<b>Totals:</b>	<b>346.9</b>	<b>147,602</b>	<b>15.5</b>	<b>25.4</b>

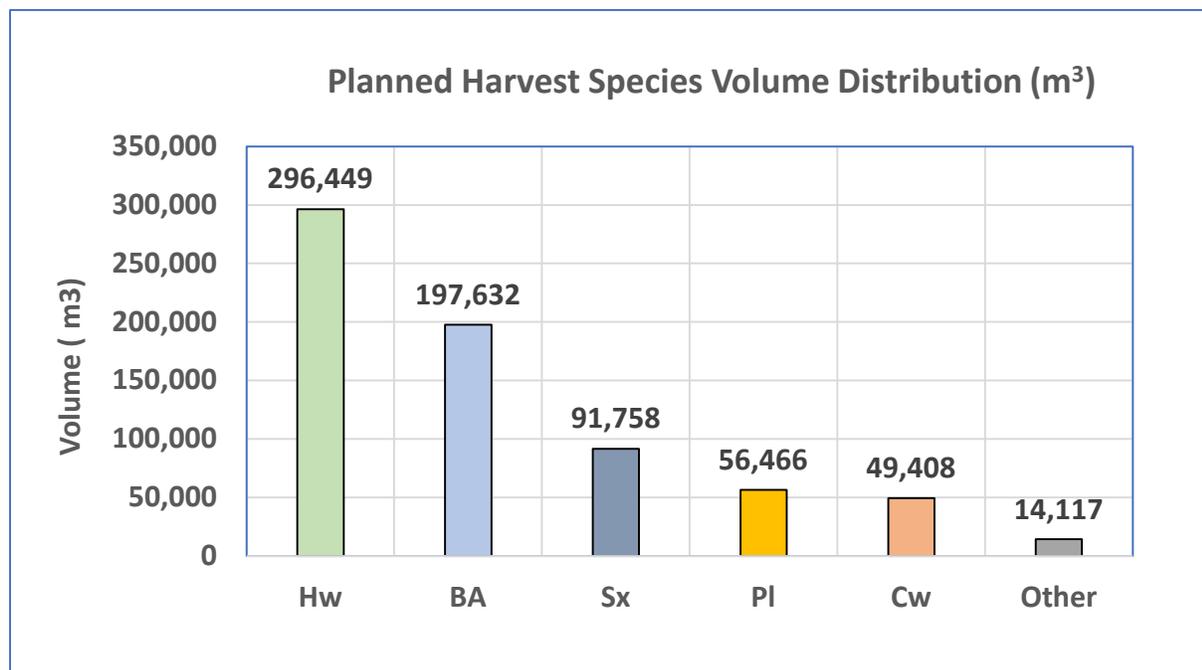
<sup>1, 2</sup> Please refer to Appendices A and B for more details.

The Block Table in Appendix A and the Road Table in Appendix B provide more detailed information about the cutblocks and roads referred to in this FDP.



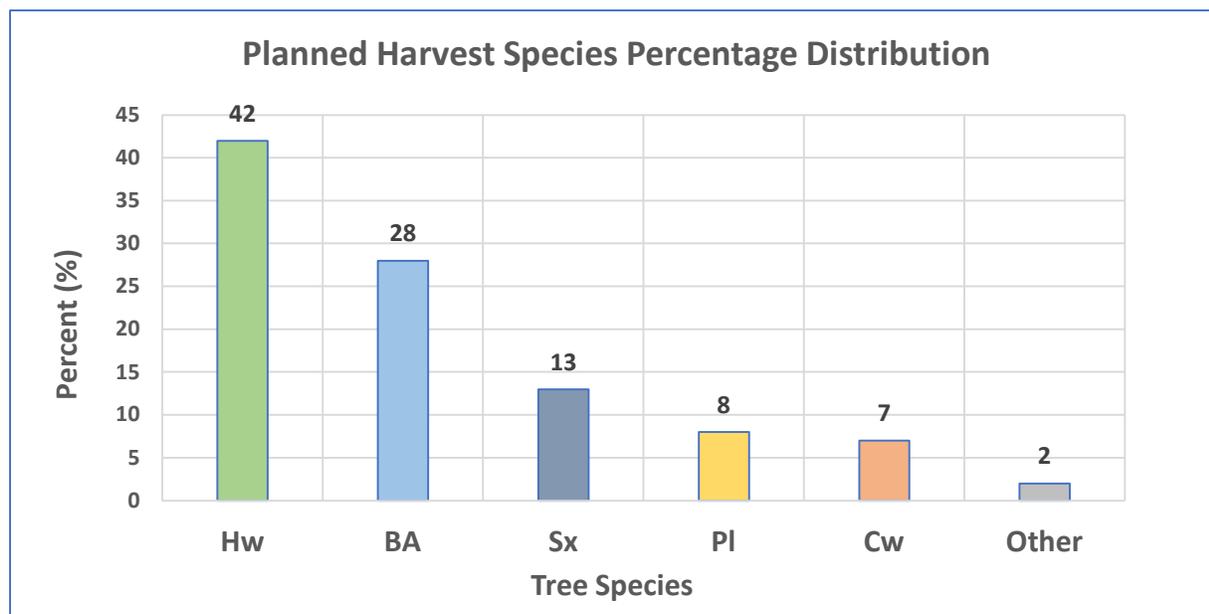
## 2.6 Forest Development Plan Timber Profile by Species

Figure 4. 2020-2025 FDP species volume distribution.



Hw – Western hemlock, BA – Amabilis fir, Sx – Spruce species, Pl – Lodgepole pine, Cw – Western red cedar

Figure 5. 2020-2025 FDP species percentage distribution.



Hw – Western hemlock, BA – Amabilis fir, Sx – Spruce species, Pl – Lodgepole pine, Cw – Western red cedar

A portion of the planned cutblocks are at higher elevations, which increases subalpine fir (*Abies lasiocarpa*)



content. Subalpine fir is combined with amabilis fir (*Abies amabilis*) in column “BA”. Column “Other” contains deciduous species (cottonwood, birch, aspen and alder).

## 2.7 Areas of Future Potential Development

Three areas have been identified that require specific attention to capitalize on timber harvesting opportunities – Kwinamuck, Monkley Bay, and Burton. The Kwinamuck area has been studied before but has not been developed due to various uncertainties involving the cost of access and the management of non-timber values. Cutblocks in the Monkley Bay and Burton areas have been included in previous FDP’s but due to the significant access costs the planned harvests did not occur. Reducing access costs is key and it may be possible to reduce those costs through volume, timing, and alternate methods of access. This FDP does not include cutblocks within any of these areas. However, NLG recognizes the importance of access to additional timber to maintain a healthy working forest and consistent harvest levels across Nisga’a Lands.

### 2.7.1 Kwinamuck Operating Area

The land use constraints that affect access to timber in many areas of Nisga’a Public Lands has made it necessary to evaluate timber harvesting in the Kwinamuck area, between the Ksga’maal and Ksi Gwinhat’al. This area has never previously been included in an FDP. Due to *Land Use Plan* constraints, an NLG Executive resolution would be required to open this area for timber harvesting. A reconnaissance of the area has found it can be accessed from the Canyon mainline via a bridge over the Ksga’maal creek.

In 2007 a forest resources feasibility report was completed on the Kwinamuck area. Part of the report addressed the development of a total chance timber harvest plan based on access and operational considerations.

The Kwinamuck area is an accessible part of Nisga’a Public Lands and, if opened for harvesting, could yield over time more than 400,000 m<sup>3</sup> of timber harvest. Developing road access into this area would create an opportunity for the Village of Gitlaxt’aamiks to access Village Lands along the north side of the Nass River.

### 2.7.2 Monkley Bay Log Dump Operating Area

The Monkley Bay Log Dump area is loosely defined as west of Ksi Hlginx following along the Nass River. There are six previously approved cutblocks in the Monkley area (ISH001, ISH002, ISH003, ISH004, ISH005, ISH006).

Due to significant access challenges and costs, the harvest of these cutblocks did not occur. These cutblocks are not included in this FDP. Accessing these timber values will be considered in future FDP’s. NLG will work with licensees to consider strategic access development within this area.



### 2.7.3 Burton Operating Area

There are three previously approved cutblocks in the Burton watershed (BUR001, BUR002, BUR003). These cutblocks are not included in this FDP due to a lack of current information about the economics, access conditions, and environmental issues that would need to be considered. A review of the Burton aerial photography has identified additional conventional harvest cutblocks. It may be possible to design a watershed level plan that identifies a significant volume of economic timber that can be accessed in one or two seasons through the Burton log dump.

## 2.8 Higher Level Plan Integration

The *Land Use Plan* is the higher-level plan for Nisga'a Lands. The *Land Use Plan* does impact the available timber harvest volumes on Nisga'a Public Lands, and its constraints are intended to protect values that have been determined through public consultation and approved by the Nisga'a Lisims Government Executive. Any forest operations that are not consistent with the *Land Use Plan* require approval by the Executive.

This FDP strives to be consistent with the *Land Use Plan*. Among other things, it takes into account the limitations and objectives that the *Land Use Plan* sets in relation to:

- timber harvesting in community watersheds
- visual quality objective management
- timber harvesting in botanical forest products zones
- access management planning for specific watersheds and road networks

## 3.0 FOREST PRACTICES TO CONSERVE AND MANAGE NATURAL RESOURCES

### 3.1 Forest Health

It is the responsibility of NLG to monitor, report on, and give management direction in respect of forest health. Maintaining forest health through suitable harvest plans and practices is the responsibility of licensees. Forest health will impact tree growth and survival, and wood yield and quality, as well as non-timber values such as fish and wildlife habitat, and recreational, scenic, botanical and cultural values. As climate change continues to advance, forest health concerns and management attention to those concerns will continue to grow. Species such as cedar are less drought tolerant than other species. Stocking standards will be adjusted at the Site Plan (or individual block) level to account for site variations if forest health concerns are noted.



### 3.1.1 Pests and Pathogens

#### 3.1.1.1 Spruce Bark Beetle (*Dendroctonus rufipennis*)

In the province of BC there is a serious spruce bark beetle outbreak occurring along the rocky mountain trench from north of Mackenzie to 100 Mile House. Since 2016, spruce bark beetle activity has been of concern on Nisga'a Lands. It is directly associated with spruce leading timber types, small pockets of spruce trees, and spruce windthrow.

In 2018 NLG directed the deployment of trap trees and pheromone traps, and in 2019 LFR conducted "sanitation" timber harvesting of susceptible spruce stands in the Fulmar creek north area (VET303, SAN001, SAN002, SAN003). LFR was also contracted by the BC Ministry of Forests, Lands and Natural Resource Operations and Rural Development to implement a trap tree prescription outside Nisga'a Lands in the Fulmar creek north area.

In the past year, LFR conducted spruce bark beetle reconnaissance probes in the ANU700 area to determine beetle activity in susceptible stands. It found no areas of immediate concern.

NLG and/or licensees will continue to monitor areas through normal ground based activities (engineering, timber harvesting, silviculture, road maintenance) and if an area of concern is identified, conduct a ground inspection to identify the infestation sites and verify the severity of damage. Mitigation measures will then be implemented to minimize impact to natural resources.

#### 3.1.1.2 Mountain Pine Beetle (*Dendroctonus ponderosae*)

The mountain pine beetle outbreak in the interior of BC collapsed several years ago mainly due to the lack of host pine stands and timber harvesting containment efforts. The likelihood that epidemic infestations of mountain pine beetle may impact lodgepole pine stands within Nisga'a Lands still exists. NLG and/or licensees will therefore continue normal monitoring practices. In 2008 a mountain pine beetle management plan was developed. NLG will review the plan for updating and continue to work with other stakeholders as needed.

Cutblock reforestation stocking standards may be altered to favor other commercial softwood species over pine and may include deciduous tree species where they are ecologically suitable.

Similar to that for spruce beetle, the management strategy for mountain pine beetle is to monitor areas through normal ground-based activities (engineering, timber harvesting, silviculture, road maintenance) and, if an area of concern is identified, then develop a control plan or outbreak management plan. The control plan may include practices such as fall and burn of infested trees and timber salvage.



### **3.1.1.3 White Pine Weevil (*Pissodes strobi*)**

White pine weevil attacks the terminal leaders of regenerated spruce trees, reducing stand growth and timber quality throughout Nisga'a Lands. The management strategy is to minimize the impact of white pine weevil through reducing the number of spruce seedlings planted on a site, managing for higher or denser levels of initial conifer stocking, and or maintaining a deciduous tree cover over regenerating spruce trees.

### **3.1.1.4 Red Band Needle Rust (*Dothistroma pini*)**

Red band needle rust is a fungus that infests juvenile lodgepole pine stands and may cause significant mortality in stands found in the northern portion of Nisga'a Lands. The disease depends on continued moist weather conditions to proliferate, so the intensity of spread may vary from year to year.

Silviculture surveys will note areas with significant damaging agents or pests and make recommendations to manage the problem. If juvenile pine plantations are expected to fail due to needle rust, silviculture plans will include, where possible, fill planting with alternate conifer species (non-pine) and, where necessary, will limit the planting of lodgepole pine to less than 20% of total stocking on all new blocks.

### **3.1.1.5 Hemlock Dwarf Mistletoe (*Arceuthobium tsugense*)**

Hemlock dwarf mistletoe has minimal impact on tree growth. It is endemic in the over-mature western hemlock stands within the northern portion of Nisga'a Lands. It primarily attacks western hemlock, although the secondary hosts, sitka spruce and amabilis fir, are also susceptible. Due to the ease by which mistletoe spreads from overstory trees to understory trees, all infected residuals greater than 2 m in height that are not required for riparian management, wildlife tree patches, or wildlife tree management purposes will be slashed. Planting of species not susceptible to infection will be specified adjacent to infected timber edges.

### **3.1.1.6 Porcupine (*Erethizon dorsatum*)**

Damage is most prevalent in the pole stage of the western hemlock and sitka spruce stands. Lodgepole pine stands are also susceptible to damage. Management actions to limit porcupine damage include managing for a mixture of tree species on regenerating cutblocks, favoring other tree species over hemlock, spruce and pine during stand tending, retaining previously damaged "sacrifice trees", and avoiding stand tending in areas with >2% current feeding damage.

### **3.1.1.7 Snowshoe Hare (*Lepus americanus*)**

Damage has been limited in recent years but is variable due to population cycles. It appears snowshoe hare populations are currently in decline. NLG and/or licensees will monitor snowshoe hare damage and adjust planting, brushing and thinning programs as required to address anticipated snowshoe hare damage. Sites at highest risk are brushy sites slated for fill planting.

### **3.1.1.8 Meadow Vole (*Microtus pennsylvanicus*)**



In the past, the meadow vole has caused damage to regenerating stands within Nisga'a Lands. Current management controls include not planting during peak population cycles and using devices such as Velar tubing for protection.

### **3.1.1.9 Root Rot Pathogens**

Tree root rot occurs at endemic levels on Nisga'a Lands and damage is normally localized and relatively insignificant. The most common root rots are annosus root disease (*Heterobasidion annosum*), armillaria root disease (*Armillaria ostoyae*), and tomentosus root rot (*Inonotus tomentosus*).

### **3.1.1.10 Other Pests and Pathogens**

Other pests and pathogens present on Nisga'a Lands include the western balsam bark beetle (*Dryocoetes confusus*) and the aspen leaf miner (*Phyllocnistis populiella*). For various reasons these pests are unlikely to have significant economic impact within Nisga'a Lands but will be considered for more active management if conditions change.

## **3.1.2 Fire Preparedness Management**

The government of British Columbia is responsible for the control and suppression of forest fires on Nisga'a Public Lands, and NLG is responsible for the control and suppression of forest fires on Nisga'a Village Lands and Nisga'a Private Lands.

NLG will ensure all logging operations will comply with the forest fire and prevention provisions in the *Nisga'a Forest Act*, Part 9, Divisions 1 and 2, and the *BC Wildfire Act*. Licensees will be required to annually submit a Fire Preparedness Plan to the Director.

### **Forest Practices to Conserve and Manage**

Road and cutblock design and prescriptions will take account of the need for fuel breaks and wildfire prevention.

Licensees will be required to ensure that potential forest fire fuels produced by operations do not pose an unacceptable risk to identified values and may employ modified harvesting methods that limit fire hazard and risk.

All logging activities will ensure that excess slash accumulations can be disposed of in a safe and orderly manner, eliminating both fire and insect hazards. Upon completion of timber harvesting activities, completed blocks and roadways will be assessed to determine if treatments are required for reforestation and hazard abatement purposes.

Appropriate treatments will be prescribed to satisfy forest protection, silvicultural and ecological management objectives, such as the retention of coarse woody debris for the maintenance of biodiversity and soil nutrients.



Specific treatments may include prescribed burning and pile burning. Prescribed burning may be used as a silvicultural tool to reduce fuel loading or for pest management. Burning strategies will be timed to minimize the risk to other resources (usually before or after the fire season) and follow provincial venting requirements.

Immediate action will be taken to extinguish any fires that may ignite due to timber harvesting operations. All fires must be reported immediately to NLG and other authorities in accordance with an approved Fire Preparedness Plan.

### **3.1.3 Windthrow**

Windthrow can be categorized as normal or catastrophic. Normal windthrow occurs on a smaller scale in areas that have an inherently higher hazard, such as block edges, ridges, and areas of frequent high winds. Catastrophic windthrow is an event that occurs infrequently when exceptionally strong winds result in large areas of downed timber.

Windthrow can have a significant impact on fisheries habitat if riparian management areas are impacted by blowdown or where windthrow creates conditions that may cause sediments to be introduced into a stream. Windthrow on sensitive soils may also lead to slope failures or slides. Areas of windthrow will be assessed to determine if the salvage of damaged timber is feasible.

#### **Forest Practices to Conserve and Manage**

To minimize the risk of windthrow when planning timber harvesting, NLG will ensure Site Plans utilize information such as blowdown history, prevailing winds, topography, stand structure, and soil conditions. Areas that are determined to be at moderate to high risk of windthrow will be identified during block planning and managed through appropriate block design. Possible practices to reduce the amount of windthrow include minimizing the amount of exposed timber edge to prevailing winds, maintaining wide buffers or leave strips along susceptible stands, clear-cutting high hazard stands or topographic features, and mechanical pruning or topping to establish a wind-firm edge. In areas with high non-timber values, edge stabilization treatments such as feathering or limbing and topping will be considered.

In a catastrophic windthrow event, an assessment of the affected area will be conducted to determine the extent of the damage, the forest health risk, and the feasibility of implementing a timber salvage plan for the area. If it is determined that salvage must occur, NLG will prepare a Timber Salvage Plan and take steps to amend the FDP as required. The time between the event and salvage of the timber is critical to minimizing forest health risk and reducing the impacts to timber values.

### **3.1.4 Reforestation**

NLG and/or licensees will be responsible for the reforestation of areas harvested under this FDP and LFR's previous FDP's. NLG ensures resources to meet reforestation obligations are provided through the ongoing collection of silviculture levies.



### **Forest Practices to Conserve and Manage**

Harvested areas will be reforested to contain at least the minimum number of crop trees per hectare as determined to be ecologically appropriate for the area unless different measures are prescribed to accommodate other forest values. Methods and strategies for adequately reforesting harvested areas are described within the Site Plans for individual blocks. Reforestation methods may include leaving the area to be naturally regenerated, planting all or part of a block, or fill planting an area that does not have enough acceptable crop trees. Maintenance of minor species such as cedar will be prescribed. Following the establishment of crop trees, appropriate treatments to encourage crop tree vigor such as brushing and weeding or spacing may be prescribed.

NLG is committed to promoting cedar in its reforestation efforts. Planting cedar on suitable sites in reforested blocks will help ensure a continuous supply of cedar over time for cultural purposes.

Previous NLG and licensee activities have been successful in meeting reforestation obligations. Obligations exist until a qualified forestry professional determines the area to be “free-to-grow”. Free-to-grow generally means that a second crop of ecologically suitable trees of minimum height and free of pests and competition can be expected to grow to maturity.

NLG and/or licensees will review and confirm the current status of each harvested cutblock (e.g., restocked, not restocked, free-to-grow) and, for the cutblocks that are not free-to-grow, will determine the treatments (e.g., fill-planting, brushing, spacing, surveys) that are required to bring them up to free-to-grow status and estimate the cost of those treatments.

## **3.2 Water Resources**

Water resource management objectives include the maintenance of water quality and quantity for domestic, recreational, agricultural and industrial use, and for wildlife and fisheries needs. The *Land Use Plan* directs that no industrial activity be permitted within areas identified as community watersheds. In addition, NLG will review existing water licences and take necessary steps to mitigate the effects of harvesting.

Certain forest health issues such as spruce bark beetle, mountain pine beetle, or wildfire may present a threat to the health of a community watershed and, in particular, to water quality. If a forest health issue occurs within a community watershed, protection of water quality and quantity will be the primary objective and direction from the Nisga'a Lisims Government Executive will be sought.

### **Forest Practices to Conserve and Manage**

The strategies that Site Plans may prescribe to protect water quality may involve some or all of the following: the designation of riparian management areas; machine free zones; fell and yard away techniques around watercourses; terrain stability assessments; prescriptions to avoid unstable sites; hydrological assessments; minimal disturbance road construction; reduced roads; capping roads, ditch drainage and sediment controls; total chance planning.



### 3.3 Fisheries

The Nass River and its tributaries are one of the most productive fish bearing river systems in British Columbia. The cultural, economic, and social importance of salmon to the Nisga'a Nation and other indigenous nations require that any disruption of fish or fish habitat is minimized.

The objective for the fisheries resource is to maintain and/or restore the integrity of all aquatic systems supporting fish.

#### Forest Practices to Conserve and Manage

Subject to the *Nisga'a Final Agreement*, NLG, the BC Ministry of Environment and Climate Change ("ENV") and Fisheries and Oceans Canada ("DFO") each play a role in the management of fisheries and fish habitat within Nisga'a Lands.

Proper identification and classification of all riparian areas will enable protection of fish populations and habitats. The FDP maps identify all mapped streams, lakes and wetlands. Unless the stream has been inventoried for fisheries values, the FDP planning process will use a default system of stream gradient and estimated stream width to conservatively classify streams.

Non-inventoried streams with less than a 20% gradient and without discernible obstructions are, by default, classified as fish bearing streams. Non-inventoried streams which exceed the 20% gradient criteria are classified as non-fish bearing streams. Non-fish bearing stream reaches that are deemed to be especially important may be managed as fish bearing.

Fisheries values are field assessed at the stand level during the preparation of Site Plans. Stream gradients, widths, and fish habitat suitability are confirmed on the ground at this time. When timber harvesting, road construction or bridge building are scheduled next to a known fish habitat, mitigation strategies and guidance from the *Standards and Best Practices for Instream Works* (2004) will be required.

When in-stream work is required outside the established timing windows, authorization from ENV and consultation with DFO may be required to ensure the appropriate protective measures are taken to minimize the impact on fish and fish habitat.

### 3.4. Riparian Management

The Nisga'a Nation has set the protection of anadromous fisheries values, including riparian areas and marine/coastal habitat, as a top priority. The objective is to maintain and/or restore the function of riparian systems. Riparian management areas are stream banks, wetlands, and the natural boundaries of a lake.

The *Nisga'a Forest Act*, Part 5, Division 2, details riparian management requirements along streams and rivers, and around wetlands and lakes. Riparian management areas provide for the protection and management of fisheries, riparian wildlife habitats, and water quality. Streamside tree retention (particularly of mature hardwoods) is to be encouraged to maintain streambank stability and stream temperature control, and to provide a source of wildlife trees and future large woody debris.



### **Forest Practices to Conserve and Manage**

Timber harvesting within a riparian management area will adhere to the criteria established within the *Nisga'a Forest Act*, section 28. The degree of retention within any specific riparian management area will be dependent on the riparian classification, the values present, and an assessment of windthrow hazard and consequences (i.e., risk).

Site-specific prescriptions will be developed to meet fish and riparian area stand level objectives. Forest practices in a riparian management area will be designed to minimize impacts on stream channel dynamics, aquatic ecosystems, water quality, and the diversity, productivity and sustainability of wildlife habitat and vegetation within the riparian management area.

## **3.5 Wildlife**

The Nisga'a Nation places a high priority on the maintenance and improvement of wildlife populations on Nisga'a Lands and within the Nass Wildlife Management area.

### **Forest Practices to Conserve and Manage**

Subject to the *Nisga'a Final Agreement*, NLG and ENV each play a role in the management of wildlife and wildlife habitat within Nisga'a Lands. Where necessary, timber harvesting plans for a Wildlife Habitat Zone established in the *Land Use Plan* will be supported by a wildlife habitat assessment and must not degrade the wildlife habitat for a designated species. Moose, grizzly bear and mountain goat have been named as designated species.

The *Land Use Plan* created Ecologically Sensitive Areas to protect ecologically sensitive, rare or vulnerable habitat. Planned timber harvesting in Ecologically Sensitive Areas will be supported by an ecological assessment and must not degrade the natural environment. No forestry activities will be permitted in areas designated as critical ecologically sensitive areas.

In addition to the above designated species, the FDP identifies the following potentially present wildlife species for further forest management consideration: furbearers (fisher, marten, fox, lynx, weasel, etc.), coastal tailed frog, great blue heron, marbled murrelet, Keen's long eared myotis, northern goshawk, and wolverine.

Site Plans will refer to the ENV *Accounts and Measures for Managing Identified Wildlife Report* (2006) for forest practices guidance, and to the *Species at Risk Act* ("SARA") legislation and species lists, BC *Government Action Regulations* ("GAR") Orders, and BC *Government Wildlife Measures* ("GWM") for further wildlife and forest management guidance and direction. Under *SARA*, species of Special Concern are to be managed to prevent the species from becoming endangered or threatened, and Threatened Species are to have a Recovery Management Plan prepared by the government authority.

These FDP objectives are centered on habitat maintenance strategies to sustain viable populations of all native wildlife species within their natural ranges. Achievement of these objectives is linked to the implementation of biodiversity and riparian management strategies. For example, the establishment of



riparian management areas, old growth reserves, and group and single tree retention requirements will provide critical components of wildlife habitat, such as wildlife trees, vertical structure, snags, coarse woody debris sources, a variety of forest edge types, and migration and dispersal corridors. Forest practices must not restrict access to hunting and trapping areas.

### **3.5.1 Moose**

Moose is a designated species. Important moose habitat is known to occur throughout Nisga'a Lands. Moose are well adapted to the early successional stages of forests, foraging extensively on deciduous trees and shrubs that colonize sites following disturbance. However, moose are also dependent on the cover provided by mature coniferous forests to provide security cover, thermal cover and access to forage during the winter, so quality moose habitat includes a variety of different interspersed seral stages.

#### **Forest Practices to Conserve and Manage**

Forest management strategies will focus on the maintenance of security and thermal cover for moose. Forest practice requirements in the Nass Bottomlands, and specifically where moose winter range can be identified, will include retaining wildlife tree patches or reserves to ensure sufficient security and thermal cover for moose. Additional forest practice requirements may include limiting the log haul to the period May to November and constructing roads and structures within 500 m of moose winter range in a manner that will facilitate effective deactivation (no vehicle access) following completion of activities.

Forage production for moose will be encouraged through silvicultural treatments such as manual brushing and managing for a component of deciduous tree species in regenerated stands.

### **3.5.2 Mountain Goat**

Mountain goat is a designated species. Steep bedrock slopes with sharp ledges and overhangs, and particularly the southern exposures, are habitat areas favored by mountain goats for purposes of predator evasion. Vertical ravines and canyons may serve as traditional seasonal movement areas as well.

As summer progresses, mountain goats will move upslope to alpine meadow habitats to feed on shrubs, grasses, sedges, and forbs. Mountain goat populations tend to compress as winter approaches, retreating to lower elevations below timber line to escape heavy snows and cold temperatures. Winter foraging will occur in very close proximity to steep escape terrain, including areas of old growth forests where browse such as coniferous trees, lichens, forbs, and mosses may be available.

Spring birthing and nursing occurs in May or June and is typically associated with extreme terrain. Overwintering and early spring birthing habitats are the most critical to mountain goat populations and may be a concern for forest management.

#### **Forest Practices to Conserve and Manage**

In areas that are identified as critical mountain goat habitat, forest management strategies will be directed by the measures prescribed in the *Kalum Ungulate Winter Range Order #U-6-001* (2012). There will be no



logging within mountain goat winter range (except individual trees for safety reasons). Logging within 500 m (2000 m for helicopter logging) of mountain goat winter range will take place between June 15<sup>th</sup> and October 31<sup>st</sup>. Roads and structures within 500 m of mountain goat winter range will be constructed in a manner that will facilitate effective deactivation (no vehicle access) following completion of activities.

### **3.5.3 Grizzly Bear**

The grizzly bear is a designated species and is a species of Special Concern under *SARA*. Grizzly bears depend on diverse habitats and do not tolerate human encounters well.

Suitable grizzly bear habitat may be found across all of Nisga'a Lands. Valley-bottom salmon streams and riparian area forests provide important forage species such as devil's club, red elderberry, currants, and skunk cabbage. Avalanche tracks and subalpine and alpine meadows are likewise important upland habitats.

#### **Forest Practices to Conserve and Manage**

Forest management strategies for grizzly bears prescribe connectivity of habitats, the maintenance and growth of forage species over time, and access management. Site Plans for the harvest of highly productive valley-bottom sites will require the preservation of diverse structures such as clusters of mature conifers with frequent groupings of deciduous trees and brushy areas in conjunction with the preservation of riparian reserves and wetland ecosystems.

Silvicultural treatments will prescribe clusters of trees through variable density planting and variable spacing densities. As management strategies for grizzly bear continue to be developed, further stand level measures will be specified within the Site Plans.

### **3.5.4 Fisher, Marten and Other Furbearers**

For fisher, marten and other furbearers, the predominant impacts of clearcut logging are the reduction of forest interior conditions leading to reduced connectivity of suitable habitat. The maintenance of connective corridors, specifically along riparian areas, within wetland forest types and to upland habitats is extremely important for maintaining habitat opportunities. The *Nisga'a Forest Act* requires the maintenance of riparian management areas along streams, lakes and wetlands.

Fisher is a species of Special Concern under *SARA*. Critical habitats for fisher are generally associated with suitable resting and maternal denning sites. Large coarse woody debris is important for both winter rest sites and as habitat for prey species. Maternal den sites are predominantly located in large, declining cottonwood.

Fisher, marten and other furbearers may avoid large openings (25 ha +) because of the lack of cover and susceptibility to being preyed upon. The maintenance of corridors or screening patches will reduce sighting distances and link unharvested forest stands.



### **Forest Practices to Conserve and Manage**

When planning timber harvesting in known fisher and marten habitat, Site Plans may prescribe wildlife tree retention patches that include large veterans and deciduous species to maintain important opportunities for denning and cover habitat and to provide sources of coarse woody debris for resting and foraging sites.

#### **3.5.5 Coastal Tailed Frog**

The tailed frog is the only known stream breeding frog in Canada. For coastal British Columbia, the tailed frog distribution coincides with the coastal western hemlock biogeoclimatic zone. The known northern limits of its distribution are found in the Coast Mountains Forest District just outside of Nisga'a Lands. However, the potential exists for the tailed frog to occur on Nisga'a Lands, specifically where coarse-grained bedrock geology is present. The coastal tailed frog is a species of Special Concern under *SARA*.

Research from the Center of Applied Conservation Biology at the University of British Columbia indicates that the coastal tailed frog primarily inhabits headwater gullies of cool and permanent mountain streams. Creek width and low fine sediment levels appear to influence coastal tailed frog populations.

### **Forest Practices to Conserve and Manage**

Management objectives are the maintenance of stream sediment levels and transport regimes, and the conservation of forested buffers along streams. Strategies such as riparian reserves, fell and yard away techniques and machine free zones in riparian management areas, and ditch sediment traps on roadways may be employed.

#### **3.5.6 Great Blue Heron, Marbled Murrelet, Keen's Long-eared Myotis and Northern Goshawk**

Great blue herons are likely present in low numbers on the coastal and estuary portions of Nisga'a Lands. It is a species of Special Concern under *SARA*. Great blue herons require abundant and accessible prey within 10 km of a breeding location. If any heron colonies are identified, NLG and ENV will be notified and a management strategy developed.

Marbled murrelets are likely present in low numbers on the coastal portions of Nisga'a Lands. It is a Threatened species under *SARA*. If any marbled murrelets are identified, NLG and ENV will be notified and site and area specific reserves and/or alternative silviculture systems may be prescribed.

Keen's long-eared myotis is a bat species with a limited and sparse distribution, and it is not known to occur on Nisga'a Lands. It is a species of Special Concern under *SARA*. If it is identified, NLG and ENV will be notified and a site-specific strategy developed for the immediate vicinity and around associated habitat features.

The northern goshawk is widely distributed throughout the Skeena Region and the interior subspecies is likely present within Nisga'a Lands. It is a species of Special Concern under *SARA*. If any northern goshawk nests are identified within planned developments, NLG and ENV will be notified and a biologist will be



consulted about a site-specific prescription which may include timing restrictions, a system of reserves and/or alternative silviculture systems (e.g., shelterwood) in the immediate vicinity of the identified nests.

### 3.5.7 Wolverine

Wolverines are widely distributed at low densities throughout British Columbia. It is a species of Special Concern under *SARA*. Wolverines utilize a variety of food items and habitat types throughout the year and may require a variety of habitat types over their large home range.

#### Forest Practices to Conserve and Manage

Because wolverines are not habitat specialists and have extensive home ranges, management will be focused on general wildlife measures such as wildlife tree patches, dispersal corridors and riparian management. If specific features such as den sites are located, they will be considered for inclusion in wildlife tree patches.

## 3.6 Botanical Forest Products

The *Nisga'a Forest Act* defines botanical forest products as pine mushrooms, and any plant or fungus that occurs naturally on Nisga'a Lands and is a prescribed botanical forest product. The *Land Use Plan* lists ten different mushroom species as well as fiddleheads as botanical forest products (pine mushroom, black morel, oyster mushroom, king boletus, blue chanterelle, funnel chanterelle, lobster mushroom, chicken of the woods, hedgehog mushroom, cauliflower mushroom). Other potential botanical forest products may include edible berries, floral products, bark, and medicinal plants.

Throughout the year, many people can be found in various locations within Nisga'a Lands collecting and harvesting botanical forest products.

#### Forest Practices to Conserve and Manage

To help manage botanical forest products, the *Land Use Plan* established the Botanical Forest Products zone. Within this zone, forest management will include consideration of the cumulative effects on the appropriate habitat for botanical forest products across all of Nisga'a Lands, and an assessment of botanical forest products habitat. Access to botanical forest product harvesting areas will not be unduly restricted by forest management practices.

A portion of the Botanical Forest Products zone consists of the Pine Mushroom polygon. The Pine Mushroom polygon was established for the protection of the commercially viable pine mushroom (*Tricholoma magnivelare*) grounds. Within the Pine Mushroom polygon and on pine mushroom habitat: (i) timber harvesting, including that associated with roads, will leave a minimum of 80% of the forest cover at an age of at least 120 years; and (ii) the silviculture system, other than for areas to be occupied by roads, will be a selection system and provide for retention of up to 70% of the total basal area of the cutblock.

The protection or management of habitat suitable for other botanical forest products or areas that are suitable pine mushroom ground outside the Pine Mushroom polygon will be dealt with on a site-specific basis within Site Plans.



### 3.7 Biological Diversity

The long-term objective of the Nisga'a Nation is to maintain and/or restore biodiversity across Nisga'a Lands. Biodiversity will be managed at the landscape and stand levels. Prior to a harvesting area being identified as Ecologically Sensitive in the *Land Use Plan*, the area will have an assessment of its ecological values to ensure those ecological values are being adequately conserved. Alternatively, an overall assessment of ecological values within the areas identified as Ecologically Sensitive in the *Land Use Plan* may be developed during the term of this FDP.

In the context of forest management on Nisga'a Lands, biodiversity (biological diversity) is regarded as the diversity of plants, animals and other living organisms in all their forms and levels of organization, and includes the diversity of genes, species and ecosystems, as well as the evolutionary and functional processes linking them.

#### Forest Practices to Conserve and Manage

Biodiversity conservation strategies in managed forests are based on evolving ecosystem management concepts that assume the needs of most organisms will be met by maintaining a range of habitats across a broad geographic distribution. Because all species cannot practically be managed on all areas individually, biodiversity must be managed at a variety of scales and across a variety of landscapes. Strategies for individual species may be specifically designed as required.

Cutblock design, including size, shape, and pattern, can be used to create a range of disturbance types and sizes, and can be enhanced by including even and uneven aged forest stand management. Small scale disturbances will be mimicked through dispersed patch cutting or uneven aged management and clearcutting with wildlife tree patch retention. Some larger patches will be cut and aggregated to form larger openings, particularly at lower elevations and on drier aspects where fire disturbance was a historic influence.

In areas of dispersed harvesting, the size range of leave areas will approximate that of harvested openings. Cutblock location across the landscape and across time will attempt to reflect natural disturbance patterns, subject to the limitations caused by previous timber harvesting. Landforms, features and site sensitivity to development will also be considered in cutblock design.

Until an analysis of patch size distribution is completed, openings that are greater than 60 ha of non-greened up area will require the granting of a variance by the Director under the *Nisga'a Forest Act*, section 24.

Connectivity at the landscape level is to be managed through riparian and upland corridors, i.e., extended rotations and use of non-clearcut silvicultural systems and corridor replacement via aggregation of harvest units. These management practices are meant to ensure that landscape level stand structures will reflect natural disturbance patterns across Nisga'a Lands.

At the stand level, an average of 10% of the area of individual cutblocks will be retained as wildlife tree patches. Patches of advanced regeneration, and non-merchantable trees retained as recruitment snags, will



further increase the diversity of stand structure at the cutblock level. Tree and vegetation species composition will be maintained by retaining a variety of native understory plants and plant communities, particularly within wildlife tree patches or riparian management areas. Where practicable, minor tree species that form less than 20% of the trees present on a cutblock may be retained as individual trees or reserved within wildlife tree patches. If these minor tree species are harvested, Site Plans will require that reforestation treatments be planned to maintain these species through planting or natural regeneration.

When carrying out forest practices, if a protected resource feature (such as a raptor nest or identified wildlife) that was not identified on an approved operational plan or permit is encountered, licensees will modify or stop any forest practice within the vicinity of the resource feature and promptly advise the Director of the nature and location of the feature.

A high percentage of the forest on Nisga'a Lands contains significant volumes of non-merchantable timber, that, subject to log markets, is often left on the cutblock. This residual and waste timber will serve a biodiversity function and may be left on the cutblock as coarse woody debris for small mammal habitat and cover. Where timber quality is such that insufficient coarse woody debris will remain post harvest, the Site Plan may require the processing (limbing and topping) of harvested trees in the cutblock.

### **3.8 Soils and Terrain Stability**

The *Nisga'a Forest Act* outlines requirements for management of the soil resource. Site Plans will comply with those requirements and prescribe forest practices that minimize soil resource impacts.

#### **Forest Practices to Conserve and Manage**

Longer-term timber harvest planning will be used to develop road access management plans which seek to minimize road construction and, in turn, soil disturbance. Stand level soil disturbance objectives will be set in Site Plans and soil disturbance rehabilitation measures will be prescribed where necessary. Harvesting systems and seasonal restrictions will be prescribed to limit soil disturbance to acceptable levels.

Terrain stability overview mapping has been shown to provide an effective landscape assessment of terrain stability. In the absence of overview mapping, Site Plans will require completion of a terrain stability assessment of all planned cutblocks and roads where side slopes are greater than 60% and where there are aerial photo, lidar or field indicators or related reports of terrain instability.

### **3.9 Timber Salvage**

Where timber is recently damaged due to windthrow, insects, disease or fire, and the timber is merchantable, economic and safe to salvage, NLG will plan for timber salvage.

#### **Forest Practices to Conserve and Manage**

Timber damage resulting in timber salvage may be caused by the activities described in this plan or an event of nature. NLG will plan and prescribe forest practices to minimize timber damage and the subsequent need for timber salvage. NLG and/or licensees will, where possible, inspect areas through the normal course of



activities or after major wind and rain events to identify damaged timber and possible timber salvage. When timber damage has been identified, licensees will be required to advise NLG. If the damaged timber is deemed salvageable, a timber salvage prescription will be developed.

### 3.10 Cultural Heritage Resources and Archaeology

A “Cultural Heritage Resource” is an object, site, or location of a traditional social practice of historical, cultural or archaeological significance to the Nisga’a Nation or the province.

Cultural Heritage Resources are identified through historical maps, archaeological impact assessments (“AIA’s”) and public comment, and will be addressed in accordance with the *Heritage Conservation Act*. AIA’s are required under the *Heritage Conservation Act* to manage and conserve archaeological resources, including areas affected by forest development proposals.

An Archaeological Overview Assessment has been completed for the Coast Mountains Forest District (including portions of Nisga’a Lands) that provides guidance in determining where AIA’s will be required.

The *Land Use Plan* has established a Heritage Preservation Zone to protect heritage sites and features identified in the *Land Use Plan*.

The *Land Use Plan* has established a Cultural Forest Products zone. The primary objective of the Cultural Forest Products zone is the production of forest resources important to the Nisga’a people, and the zone must be managed in such a way as to ensure that the cultural forest resources continue to be available. Cultural forest resources include botanical forest products, medicinal products such as devil’s club, food resources such as berries, and specific tree species such as cedar.

Forest practices must address the cultural forest resources that have been identified as important to the Nisga’a Nation. Timber harvesting prescriptions will consider the cumulative effects on identified cultural forest products across all of Nisga’a Lands.

#### **Forest Practices to Conserve and Manage**

AIA’s will be completed on planned cutblocks that show or have a high likelihood of containing archaeological resources. Site Plans will specify the appropriate actions.

Planned timber harvesting must not restrict access to cultural forest product areas. In the Cultural Forest Products zone, Site Plans will prescribe the growing of cedar on sites suitable for cedar.

The hot springs at Hlgu Isqwit (Little Stink Hot Spring) and Ksgyukwsa’a (Burton Creek Hot Spring) have been identified as Cultural Heritage Resources and mapped. No harvesting will be planned near them. NLG will conserve these cultural heritage features as recreation sites and manage the hot springs views with partial retention of visual quality as the objective. Site Plans will ensure that the forested area and any cutblocks in the vicinity of the hot springs are managed so as to minimize the risk of diverting or affecting ground water.

Where forest development activities may specifically encroach on a cultural site, Nisga’a citizens will be advised.



### 3.11 Recreation

Recreation values within Nisga'a Lands are mainly associated with the adjacent Anhluut'ukwsim Laxmihl Angwinga'asanskwhl (Nisga'a Memorial Lava Bed Park), the Nass River and some major tributaries, the coastal marine environment at the mouth of the Nass, and the designated recreation sites at Dragon Lake, Hlgu Isgwit (Little Stink Hot Springs), and the Ishkheenickh River (Quilgauw). For the purposes of forest management planning, the Kwinamuck Lake site will also be considered a recreation site.

Cultural resource features also contribute to recreational and tourism-based activities. Hlgu Isgwit (Little Stink Hot Springs) and Ksgyukwsa'a (Burton Creek Hot Springs) are cultural resource features, have very high recreational values and will also be treated as recreational sites for the purposes of forest management.

#### Forest Practices to Conserve and Manage

NLG supports potential outdoor recreation and tourism based economic development at the recreational sites and will work within its organization and with external entities to ensure that recreational values are accommodated in its plans.

Site Plans will ensure visual standards are maintained on Nisga'a Lands. Specifically, visual impact assessments (VIA's), when required, will confirm that standards will be achieved prior to logging operations. Standards exist for the all recreation sites, all communities, and the Nisga'a Highway.

Site Plans will ensure that a VIA will be conducted on cutblocks within 1 km of Anhluut'ukwsim Laxmihl Angwinga'asanskwhl (Nisga'a Memorial Lava Bed Park) or within the Tseax visual polygon to ensure that timber harvesting will not result in more than 10% of the visual area having vegetation of a height less than 5 metres.

#### 3.11.1 Designated Recreation Sites

##### Dragon Lake Recreational Site

The Dragon Lake recreational site is located on the west side of Dragon Lake. It is a day-use and overnight camping site with a small dock and a boat launch area, it also includes a boat-in picnic site on the north-east side of the lake. Both local users and tourists enjoy the use of the recreational site at Dragon Lake.

#### Forest Practices to Conserve and Manage

Site Plans will require preparation of VIA's for various visual quality objectives and review them with local day-use and overnight tourist visitors to assist in designing cutblocks above Dragon Lake.

##### Hlgu Isgwit Recreational Site

Hlgu Isgwit (Little Stink Hot Springs) is a recreational site is located on the south side of Highway 113, near Gitwinksihkw. It is a day-use site with a natural hot spring pools, it also includes a parking area adjacent to the highway and washroom facilities. Both local users and tourists enjoy the use of the recreational site.



### **Forest Practices to Conserve and Manage**

Site Plans will ensure that the forested area and any cutblocks in the vicinity of the hot springs are managed so as to minimize the risk of diverting or affecting ground water. Site Plans will also ensure that visual quality objectives required for recreation sites are met.

### **Ishkheenickh River (Quilgaux) Recreational Site**

The Ishkheenickh River recreational site is located between the main logging road and the Ishkheenickh River. It is a day-use and overnight camping site used primarily for sport angling. Both local users and tourists enjoy the use of the recreational site.

### **Forest Practices to Conserve and Manage**

Site Plans will require preparation of VIA's to ensure visual quality objectives required for recreation sites are met.



## 4.0 Forest Development Plan Public Review and Comment Schedule

	Location	Distribution Date	Consultation Date
Gitlaxt'aamiks	Nisga'a Lisims Government Admin Bldg.	May 22, 2020	1
Gitlaxt'aamiks	Gitlaxt'aamiks Village Government	May 22, 2020	1
Gingolx	Gingolx Village Government	May 22, 2020	1
Laxgalts'ap	Laxgalts'ap Village Government	May 22, 2020	1
Gitwinksihlkw	Gitwinksihlkw Village Government	May 22, 2020	1
Terrace	Terrace Nisga'a Urban Local Office	May 22, 2020	1
Prince Rupert	Gitmaxmak'ay Nisga'a Office	May 22, 2020	1
Vancouver	Nisga'a Ts'amiks Office	May 22, 2020	1

1 COVID-19 prevents public meetings and restricts social gatherings.

## 4.1 Forest Development Plan Public Comment Summary<sup>1</sup>

Section	Comment Summary	Action

1 Completed following the Public Review and Comment Period.



## 5.0 Appendices

Appendix A:	Forest Development Plan Cutblock Table
Appendix B:	Forest Development Plan Road Table
Appendix C(1):	1:20,000 Forest Cover Maps
Appendix C(2):	1:20,000 Known Resource Values Maps
Appendix D:	1:50,000 FDP Overview Maps (North and South)