SUPPORTING DOCUMENT FOR THE COAST MOUNTAINS NATURAL RESOURCE DISTRICT FOREST STEWARDSHIP PLAN 2023-2028

BC Timber Sales – Skeena Business Area for Operations in the Coast Mountains Natural Resource District Cascadia TSA (including TFL 1), Kalum TSA, Nass TSA, GBR North TSA, and Pacific TSA (including TFL 41)

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1 INTRODUCTION

This document is provided in support to the Forest Stewardship Plan (FSP) for the Coast Mountain Natural Resource District (CMNRD) portion of the Skeena Business Area of BC Timber Sales (BCTS). This supporting document is organized as follows:

Section SD 1: Introduction, interpretations, and context of this FSP within the current planning framework that exists on the FSP area.

Section SD2: General descriptions and discussion of issues with respect to each of the eleven forest values that have been identified in the *Forest and Range Practices Act (FRPA),* followed by information that relates directly to the strategies and results noted in the FSP. The general discussion allows a more conversational description of the intent of the FSP and adds clarity and context to the enforceable strategies and results noted in the FSP. It is BCTS' intent that this will simplify the FSP for the layperson.

This "Supporting Document" is not considered part of the FSP. Nonetheless, it is important to have this document in hand when reviewing the FSP, as it provides context for the strategies and results described in the FSP. The information in the Supporting Document pertains to BCTS and may not always be consistent with Gitxaala Forest Products Ltd. who are also signatories on the FSP.

1.1 Context of the FSP within the Existing Planning Framework

The FSP is within the CMNRD. The FSP includes the Kalum South, Nass, and North Coast Forest Development Units (FDU), which include areas within the Kalum, Great Bear Rainforest (GBR) North, Cascadia, Nass, and Pacific Timber Supply Areas (TSA) as well as Tree Farm Licences (TFL) 1 and 41. The following sections describe the strategic planning initiatives that have occurred within the area that overlaps with this FSP.

1.1.1 Fiddler Creek Total Resource Plan

The Fiddler Creek Total Resource Plan (TRP) was completed in 1995 by the Ministry of Forests in consultation with Skeena Cellulose Inc. and the Gitxsan and Kitselas First Nations. The Fiddler TRP is intended to provide direction for operational planning and forest practices. It was approved by the District Manager in 1995 but has not been incorporated into the Kalum Land and Resource Management Plan (LRMP), nor has it been designated a higher-level plan.

The purpose of the Fiddler TRP was to manage all resources, including timber, wildlife habitat, biodiversity, visual landscape, recreation and aboriginal interests.

The Fiddler TRP divided the area into four management zones with objectives as follows:

Zone 1: Critical Habitat Zone: The objective for this area was to maintain wildlife rearing and feeding areas and manage riparian areas for water quality, fish habitat and biodiversity. Section 2 of the FSP describes the results and strategies for riparian areas and for wildlife and biodiversity objectives (*Forest Planning and Practices Regulation* (FPPR) sections 7(1), 8, 9, and 9.1), and these will capture the intent of the TRP objective.

Zone 2: Fish and Wildlife Special Management Zone: The objective was to provide areas for feeding, rearing, travel and shelter ranging from the valley bottom to alpine areas and to conserve fish habitat areas. The Kalum South chapter of the FSP describes the results and strategies for riparian areas and for wildlife and biodiversity (FPPR s. 7(1), s. 8, s. 9, and s. 9.1) and these will capture the intent of this objective.

Zone 3: Visually Sensitive Zone: The objective was to minimize the visual impact from Highway 16. The area was broken down into three subzones: subzone 3A has a retention Visual Quality Objective (VQO), subzone 3B has a partial retention VQO, and subzone 3C has a modification VQO. These VQOs have been established for the scenic area that covers the Fiddler TRP area, and Section 2 of the FSP describes the results and strategies for visual quality (FPPR s. 10), and these will capture this objective.

Zone 4: Working Forest Zone: The objective was to maintain a wood supply for the forest industry while mitigating long term detrimental impacts on biodiversity and wildlife habitat. This is consistent with the objectives of FRPA.

During the preparation of the Fiddler TRP, the Lax' Skiik of the Gitxsan provided the Ministry of Forests with an infrastructure map (January 1995) which included trails throughout the area. The importance of these trails to the Lax' Skiik is recognized by BCTS. The management strategy for conserving these trails may vary from a reserve corridor to retaining stand structure through partial cutting. The level of retention will generally depend on the level of current use and relative importance to the trail infrastructure. The advent of the *Forest Practices Code Act of BC (FPC)* and its evolution into the *FRPA* means that the resource zoning and management guidance from the Fiddler TRP has been captured by the strategies and results in this FSP.

1.1.2 Gitanyow Lax'yip Land Use Plan

The Gitanyow Lax'yip Land Use Plan was approved by Government on March 28, 2012. The management goals, objectives, measures/indicators and targets apply throughout the Gitanyow Lax'yip (the traditional territory of Gitanyow). The plan is the outcome of collaborative strategic land use planning undertaken by Gitanyow and the Province for the Gitanyow Lax'yip, which overlap portions of the Nass and Kalum South FDUs.

1.1.3 Gitwangak Land Use Plan for all Gitwangak Traditional Territory within the Coast Mountains and Skeena Stikine Natural Resource Districts

The objectives and strategies found within the Gitwangak Land Use Plan for all Gitwangak Traditional Territory are specific to the Land Use Plan Area and reflect Gitwangak desires and vision regarding the resource management on the Gitwangak Territories. The plan is within the Coast Mountains and Skeena Stikine Natural Resource Districts. The plan overlaps the Kalum South FDU of the CMNRD FSP and is considered by BCTS when operational activities are planned within the area.

1.1.4 Great Bear Rainforest Land Use Order

It is the goal of the Province, through land use objectives and other measures, to implement ecosystem- based management within the Great Bear Rainforest area that overlaps North Coast FDU. The Province is committed to implementing ecosystem-based management in a manner that maintains ecosystem integrity and improves human well-being concurrently.

In December 2007, the Central and North Coast Order (CNCO) was signed by the Minister of Agriculture and Lands. This order replaced the 2007 South Central Coast and Central and North Coast Land Use Orders, as amended in 2009 and 2013. The intent was to improve protection and maintenance of First Nation forest and cultural values; achieve further progress toward long term protection and maintenance of aquatic ecosystems, biodiversity and wildlife; and provide for stable social and economic benefits, including carbon benefits, for First Nations and other citizens dependent upon the area, ensuring worker safety and maintaining stable access to forest lands that support viable commercial forestry opportunities.

The *Great Bear Rainforest Order* (GBRO), effective January 28, 2016, supersedes the CNCO. The GBRO provides an important tool for enabling the implementation of Ecosystem-Based Management (EBM) in the Great Bear Rainforest. It establishes legal objectives pursuant to section 93.4 of the *Land Act*, for the purpose of directing forest practices implemented under the FRPA.

For the purpose this Order, the specific intent in relation to maintenance of forested ecosystems is to establish a Natural Forest of 3,108,876 hectares (ha) and to maintain old forest representation of each ecosystem at 70% of the range of natural variation (RONV) across the GBRO area. The intent of this order is to establish a Managed Forest area of 550,032 ha and an AAC of 2.5 million m3 for the area until March 31, 2025.

Currently, through a Government-to-Government Ecosystem Based Management Forum (G2G EBM Forum), Government is working with stakeholders, Coast Forest Conservation Initiative (Interfor, BCTS, Western Forest Products) and Mosaic and Rainforest Solutions Project (SierraClub BC, Greenpeace and Stand.Earth) to complete a review of the GBR Order and present consensus recommendations to provincial and First Nations decision makers in 2022. The focus of the review is the development of policy and legislative amendment recommendations that will improve the collective implementation of GBR commitments. This includes changes to expedite the mapping of the remaining landscape reserves and identification of commercial harvesting areas as defined through the Landscape Reserve Design (LRD) process. It is expected that the GBR Order will be amended, following public review and consultation, in early 2023. At that time all forest tenure holders, including BCTS, will be required to complete a mandatory FSP amendment with new results and strategies for the amended objectives.

1.1.5 Kalum Land and Resource Management Plan (LRMP)

The Kalum LRMP covers the geographic area that, at the time, coincided with the extents of the Kalum TSA and TFL 1 and 41. Since that time, discreet portions of the TFL 1 and TFL 41 areas have been deleted from the administrative boundaries of these TFL's and are now administered with the more recently created Cascadia and Pacific TSAs. The LRMP was approved by the provincial cabinet in 2002, but it was not designated as a "higher level plan" as defined in the FPC, nor in the FRPA. Therefore, the Kalum LRMP does not provide any legal objectives under FRPA, and as a result, no land-use objectives are listed in the FSP document.

However, since the LRMP did receive cabinet approval in May 2002, a clear message has been sent that it provides guidance for forest management considerations. Therefore, it is incumbent on both BCTS' professional staff and the delegated decision maker (DDM) that the information in the LRMP be considered in the formulation and review of those parts of the FSP that overlap the LRMP area.

1.1.6 Kalum Sustainable Resource Management Plan

The Kalum Sustainable Resource Management Plan (SRMP) covers the geographic area that at the time coincided with the extents of the Kalum TSA and TFL 1 and 41. Since that time, discreet portions of the TFL 1 and TFL 41 areas have been deleted from the administrative boundaries of these TFL's and are now administered with the more recently created Cascadia and Pacific TSAs. The SRMP has been prepared to take the appropriate aspects of the non-legal Kalum LRMP and make them legal. In addition, the SRMP has updated the wording from the LRMP to improve the clarity of the objectives, and to allow measurable and verifiable strategies or results to be developed.

The SRMP was approved by a delegate of the Minister of Agriculture and Lands in April 2006, and the SRMP objectives were declared as "Land Use Objectives" under section 93.4(1) of the

Land Act. Therefore, the Kalum SRMP provides legal objectives under FRPA, and as a result, the land-use objectives from the SRMP are listed in the FSP document, and strategies and results are provided in the FSP that are consistent with the SRMP objectives.

1.1.7 Kowesas Sustainable Resource Management Plan

The Kowesas SRMP achieved a draft status (October 2006), but no further work has been completed on this plan. This SRMP covered the Kowesas Landscape Unit in the southern portion of the Coast Mountains Natural Resource District. This plan was developed in collaboration with the Haisla First Nation, West Fraser Mills Ltd., the Ministry of Forests and Range and the Ministry of Environment. This plan provided guidance towards implementing the objectives and strategies of the Kalum Land and Resource Management Plan that relate to forestry development and the *Forest and Range Practices Act* (FRPA). Kwinageese Integrated Resource Management Plan

1.1.8 Kwinageese Integrated Management Plan

The Kwinageese Integrated Management Plan was completed in 1992. It has not been kept up to date and has since been superseded by the *FPC* and now the *FRPA*.

1.1.9 Nass Sustainable Resource Management Plan

The Nass South SRMP is a landscape level plan developed to address sustainable management of land, water and resources in the southern portion of the Nass TSA. The Nass South SRMP was approved by Government in 2012. The plan covers approximately 660,000 hectares of the southern portion of the Nass TSA. It was developed in partnership with the Gitanyow, the Nisga'a Nation as represented by Nisga'a Lisims Government (NLG), key stakeholders and government agencies. It is intended to provide a balance of social, economic and environmental values that meet the interests of all those who have a concern for the area.

The Nass South SRMP LUOR Order established legal objectives for a selection of Nass South SRMP land use objectives.

1.1.10 Nass South SRMP Land Use Order

The Nass South SRMP LUOR Order (effective February 25, 2016) legally establishes a portion of the land use objectives in the Nass South SRMP.

1.1.11 North Coast Land and Resource Management Plan

The North Coast Land and Resource Management Plan (LRMP) covers the North Coast TSA, now replaced by the GBR North TSA, and a portion of Tree Farm Licence 25. A consensus version of the LRMP was published in February 2005, but it has not received Cabinet approval, nor has it been designated as a "higher level plan" as defined in the *FPC*, nor in the *FRPA*. Therefore, the North Coast LRMP does not provide any legal objectives under FRPA, and as a result, no land-use objectives are listed in the FSP document. However, aspects of the LRMP have now been made legal through the CNCO (see below), which has been superseded by the establishment of the GBRO.

1.1.12 North Coast Marine Plan

The North Coast Marine Plan (NCMP) (September 2015) outlines a vision, objectives and strategies for the management of the North Coast coastal and marine areas and was founded on an EBM framework. The plan includes recommendations from member and partner First Nations and Provincial agencies on uses and activities within the plan area. This plan is the culmination of several years of effort by representatives of the Gitga'at, Haisla, Kitselas, Kitsumkalum, and

Metlakatla First Nations (represented by the North Coast - Skeena First Nations Stewardship Society), the Province of BC and various marine sector interests. This cooperative planning process is part of the broader First Nations – BC Marine Planning Partnership for the North Pacific Coast (MaPP) initiative.

The NCMP does not provide legal objectives under FRPA to the FSP but does provide management direction and related spatial zones that are specifically applicable to forestry operations of the BCTS Skeena Business Area in the coastal and marine areas of the CMNRD. The NCMP includes recommendations to decision makers and is a source of guidance for tenure authorizations and marine resource use decisions in North Coast coastal and marine areas.

1.1.13 Swan Lake Wilderness Management Plan/ Swan Lake Kispiox River Park Management Direction Statement

The Swan Lake Wilderness Area has been incorporated into the Swan Lake Kispiox River Provincial Park. The Swan Lake Wilderness Plan has been superseded by the Swan Lake Kispiox River Park Management Direction Statement (MDS). No strategies or results are necessary to be consistent with the MDS.

The Swan Lake Wilderness Plan identified that views from Swan Lake are to be managed to retention VQO with the maximum visible alteration being five percent. The Ministry of FLNRORD has since established scenic areas for Highway 37, and it assumed that these scenic areas have captured the appropriate parts of the Swan Lake viewscape.

1.1.14 Thunderbird Integrated Resource Management Plan

The Thunderbird Integrated Resource Management Plan (TIRMP) was a pre-FPC plan. Nonetheless, the plan was prepared through a consensus based, multi-interest, public planning body, so it was important to review and incorporate the management intent of the TIRMP into the Kalum LRMP. It was determined that the intent of the TIRMP would be addressed through implementation of:

1) Forests practices legislation and regulations,
2) General resource management direction that applies to the whole Kalum Land and Resource Management Plan area, and
3) Designation of a Special Resource Management (SRM) Zones (subzones 1 and 2) within the Kalum LRMP for the Lakelse River corridor. This designation was made legal with the establishment of the Kalum SRMP.

The Kalum LRMP also adopted two protected areas from the Thunderbird planning area: Hai Lake/Mt. Herman and Lakelse Lake Wetlands. These areas have now been designated as provincial parks.

1.1.15 Interpretation

All references to the Forest and Range Practices Act, or to FRPA, mean the Forest and Range Practices Act (SBC 2002, Chapter.69, effective November 25, 2021) as it was on September 06, 2022

All references to the Forest Planning and Practices Regulation, or to “FPPR”, mean the Forest Planning and Practices Regulation (BC Reg 14/2004, effective March 11, 2021) as it was on September 06, 2022

All references to the Government Actions Regulation, or to GAR, mean the Government Actions Regulation (BC Reg 582/2004, effective March 11, 2021) as it was on September 06, 2022

All references to the Land Act mean the Land Act (Chapter 245[RSBC 1996], effective November 15, 2019) as it was on September 06, 2022

All references to the Central and North Coast Order, or CNCO, mean the Central and North Coast Ministerial Land Use Order (December 2007, as amended March 27, 2009).

All references to the Central Coast Land and Resource Management Plan, or CCLRMP, mean the Central Coast Land and Resource Management Plan (May 2004).

All references to the Kalum Land and Resource Management Plan, or Kalum LRMP, mean the Kalum Land and Resource Management Plan (May 2002).

All references to the Kalum Sustainable Resource Management Plan, or Kalum SRMP, mean the Kalum Sustainable Resource Management Plan (April 28, 2006).

All references to the Nass South SRMP LUOR Order mean the Nass South Land Use Objectives Regulation Order Sustainable Resource Management Plan (February 25, 2016).

All references to the Great Bear Rainforest Order, or GBRO, mean the Great Bear Rainforest Order (January 28, 2016).

Unless otherwise noted, statements and information provided are current to September 06, 2022. Every effort has been made to ensure that current data have been used in map generation and analyses: i.e. current to September 06, 2022.

1.1.16 Acronyms

Acronyms used in the FSP or Supporting Document are as follows:

AFR:	Aboriginal Forest Resources
AHF:	Aboriginal Heritage Features
AIA:	Archaeological Impact Assessment
ATV:	All Terrain Vehicles
BA:	Basal Area
BCTS:	BC Timber Sales
BEC:	Biological, Ecological, and Climatic; or Biogeoclimatic Ecosystem Classification
BMP:	Best Management Practices BC Timber Sales - Business Area Environmental Management System (EMS) and Sustainable Forest Management (SFM) - Province of British Columbia (gov.bc.ca)
C&E:	Compliance and Enforcement
CDC:	Conservation Data Center
CMNRD:	Coast Mountains Natural Resource District
CMT:	Culturally Modified Tree
CWD:	Coarse Woody Debris
CWH:	Coastal Western Hemlock
DDM:	Delegated Decision Maker
DFO:	Fisheries and Oceans Canada
ECA:	Equivalent Clearcut Area
EMS:	Environmental Management System
FDP:	Forest Development Plan
FDU:	Forest Development Unit

FL:	Forest Licence
FLTC:	Forestry Licence to Cut
FOR:	Ministry of Forests
FPC	Forest Practices Code
FPPR:	Forest Planning and Practices Regulation
FRPA:	Forest and Range Practices Act
FSP:	Forest Stewardship Plan
GAR:	Government Actions Regulation
GWM:	General Wildlife Measure
HLP:	Higher Level Plan
ICH:	Interior Cedar-Hemlock
LRMP:	Land and Resource Management Plan
LUOR:	Land Use Order Regulation
LU:	Landscape Unit
LWRS:	Ministry of Land, Water and Resource Stewardship
MAL:	Ministry of Agriculture and Lands
MSD:	Management Direction Statement
MH:	Mountain Hemlock
NCMP:	North Coast Marine Plan (2015)
NAR:	Net Area to be Reforested
NDT:	Natural Disturbance Type
NSR:	Not sufficiently restocked
OGMA:	Old Growth Management Area
OSBG:	Objectives set by Government
Period of the FSP:	The 5-year period commencing on the day of approval of the CMNRD BCTS Skeena Business Area Replacement FSP 2023-2028
QP:	Qualified Professional
RIC:	Resource Inventory Committee
RMA:	Riparian Management Area
RMZ:	Riparian Management Zone
RONV:	Range of Natural Variation
RPBio:	Registered Professional Biologist
RPF:	Registered Professional Forester
RRZ:	Riparian Reserve Zone
SP:	Site Plan
SRMP:	Sustainable Resource Management Plan
SSAF:	Skeena Sustainability and Assessment Forum
TFL:	Tree Farm Licence
TRP:	Total Resource Plan
TSA:	Timber Supply Area
TSM:	Timber Sales Manager Skeena Business Area
TSFA:	Terrain Stability Field Assessment

TSK:	BC Timber Sales – Skeena Business Area
TSL:	Timber Sale Licence
UWR:	Ungulate Winter Range
VIA:	Visual Impact Assessment
VQO:	Visual Quality Objective
VSC:	Visual Sensitivity Class
WAP:	Watershed Assessment Procedure
WHA:	Wildlife Habitat Area
WQEE:	Water Quality Effectiveness Evaluation
WTRA:	Wildlife Tree Retention Area

2 INFORMATION DIRECTLY RELATED TO THE RESULTS AND STRATEGIES

This section provides additional information on how the strategies or results identified in the FSP are consistent with objectives set by government and how they relate to the forest values identified in the FRPA.

The section is organized by the forest values identified in the FRPA[1]: this is to allow a natural flow to the wording and background discussions.

Many strategies or results apply to more than one forest value, however they are only listed under the main FRPA value they relate to.

The following paragraphs are reproduced from the FSP document to remind the reader of the structure of Objectives, Strategies, and Results:

Objectives are descriptions of how overall goals are to be achieved. In this case, the goals are increased flexibility in forest management, decreased administrative complexity, and maintenance of environmental protection. Objectives can vary from place to place, depending on the circumstances of the area. The FRPA defines three types of objectives:

Objectives set in regulation

These objectives are explicitly states in the FPPR and apply provincially.

Objectives enables by regulation

The *Government Action Regulation* (GAR) provides authority to the Ministers of Forest Lands and Natural Resource Operations and Rural Development to establish objectives for certain items described in the regulation.

These objectives can apply at many different scales.

Notices providing information on habitat amount, distribution, and attributes have been provided for several wildlife species under section 7(2) of the FPPR (“Section 7” notices).

Orders can be issued under the GAR for a variety of items. For example, the minister responsible for the *Forest Act* may identify an interpretive forest site, the minister responsible for the *Land Act* may establish an area as a scenic area; the minister responsible for the *Wildlife Act* may establish an area as a wildlife habitat area or as ungulate winter range.

Land-use objectives

These are objectives specific to a certain area that have been established through a Landscape Unit Plan or some sort of higher-level plan such as a Land and Resource Management Plan. The Minister of Land, Water and Resource Stewardship (LWRS) sets these objectives. This FSP includes land use objectives from the Kalum SRMP, Nass South SRMP, and the GBRO.

Strategies are measurable or verifiable steps or practices that will be carried out to achieve consistency with a particular established objective, and the situations or circumstances that determine where in a FDU the steps or practices will be applied.

Results are measurable or verifiable outcomes in respect of a particular established objective, and the situations or circumstances that determine where in a FDU the outcomes will be applied.

[1] Soils, Timber, Wildlife, Water, Fish, Biodiversity, Cultural Heritage Resources, Recreation Resources, Resource Features, Visual Quality, and Forage

Practice requirements are measurable or verifiable outcomes, steps, or practices in respect of a particular established objective. Under the FPPR, some practice requirements are mandatory, and some practices requirements are optional. The FSP can default to using the optional practice requirements. These "default" practice requirements are considered to achieve some of the objectives set by government and relieve the FSP Holder from having to provide strategies or results for certain objectives. However, the FPPR allows a FSP to provide alternative strategies or results that can also achieve these objectives, and by doing so, the "default" practices requirements will no longer apply to activities under the FSP. The reference tables in the FSP note which practices requirements are mandatory and which "default" practice requirements have been adopted or replaced by alternative strategies or results.

The remainder of this section provides background information on the forest values, and the details associated with the formulation of strategies or results.

2.1 Soils

2.1.1 General Information

Consistency with the soils objective is achieved through taking action on roads, which are a known conduit for the movement of erodible soils. Regular inspections will allow the risk of erosion to be mitigated.

The soils on the FSP area are predominated by podzols[2] and are typical of the cool, moist climate, deep snowpacks, and short growing season. The structure of the soils and its parent material is highly variable over the landscape, with clay- or silt-dominated soils being the most sensitive to erosion.

Maintenance of forest soil is facilitated by keeping the soil where it is – this is accomplished through consistency with the objectives set by government for soils, as described in section 2 of the FSP. Review of this section shows that currently, the only objectives are those set-in regulation; there are no objectives enabled by regulation, nor are there any land use objectives.

BCTS has elected to follow the defaults outlined in Sections 35 and 36 of the FPPR to ensure consistency with the objective for soils. These defaults describe limits for allowable soil disturbance on a site, and limits on the area that can be given over to roads or landings.

In addition to these defaults, for roads that fall under BCTS' responsibility (i.e. covered by a Forest Service Road (FSR), or Timber Sales Licence (TSL)), BCTS will ensure a risk assessment is completed to determine and document an inspection frequency. Road maintenance inspections will be completed in accordance with the results of the assessment, or if a risk assessment has not been completed, the minimum inspection frequency is once per year where roads have been inactive for 9 months, or once every 3 months where hauling is occurring. BCTS will address maintenance issues identified through road inspections based on priorities set by BCTS.

In general, the intent of BCTS operations is to avoid areas having a high potential for landslides. When potentially unstable areas are unavoidable, operations will be prescribed and conducted in a manner that limits the risk of landslides and soil erosion. For instance, when operations are planned in areas with potential instability, risk of soil erosion or of potential impact on the environment can be limited by following the results and recommendations of detailed terrain stability field assessments. BCTS also has guidelines for heavy rainfall shutdown procedures to evaluate the potential for a landslide at a given site.

2.1.2 Terrain Stability and Soil Erosion

Forest development has the potential to cause, or be affected by, landslides and soil erosion events. To provide a locally relevant decision-making framework to professionals involved in the management of terrain stability, BCTS Skeena has developed an initial version of a Terrain Stability Management Model

[2] Coarse, well-drained soil formed under cool, moist conditions that has its upper layers leached of organic matter and primary minerals.

for implementation and evaluation. This model provides guidance regarding the completion of terrain assessments, establishes risk criteria for specified values, and provides strategies and a decision-making process to analyze and document decisions concerning the management of terrain stability.

Overview terrain stability and hazard mapping exists for the majority of BCTS' operating areas which have stability concerns. Where overview assessments have not been completed, BCTS has mapping that identifies areas where slopes exceed 60%.

Terrain stability field assessments (TSFA) and/or site specific operational prescriptions may be prepared for those areas planned for development that have unstable or potentially unstable terrain, or that have high, or very high, soil erosion potential. Part of the terrain assessment report will include an evaluation of cut block/opening shape and size, or of proposed road locations, with a focus on their effect on soil erosion potential. TSFAs identify mitigation measures to minimize erosion and landslide potential within, adjacent to, and down slope of areas proposed for development. TSFAs are conducted by experts in the fields of geomorphology, geology or engineering. These protective measures may include relocating a section of road or block boundary, end hauling, full suspension cable harvesting, the season to conduct harvesting, road deactivation, or other measures to maintain slope stability.

Sites requiring TFSAs are identified by BCTS personnel in the planning or layout stage and the TSFA will generally be undertaken concurrent with block and road layout. Where a TFSA is completed for an area, BCTS operations will be consistent with the assessment's results and recommendations.

In addition to the Terrain Stability Management Model and, as part of its Environmental Management System (EMS), BCTS also has an Emergency Response Plan (ERP) to deal with an emergency like a landslide or road wash-out. These key elements of the EMS are readily available from the BCTS Skeena website.

2.2 Timber

2.2.1 General Information

The total annual allowable cut apportionment administered by the BCTS Skeena Business Area is 796,478 m^3 and, at the time of submission, the apportionment within the area of this FSP is 542,245 m^3.

The timber inventory in the area covered by the Kalum South and Nass FDUs varies from primarily Western Hemlock (Tsuga heterophylla) and Sub-alpine Fir (Abies lasiocarpa) in the North, to Western Hemlock and Balsam Fir (Abies amabalis) in the South. Sitka (hybrid) Spruce (Picea sitchensis var.), Mountain Hemlock (Tsuga mertensia), and Lodgepole pine (Pinus contorta) are also found throughout the FSP area in lesser amounts. Western Red Cedar (Thuja plicata) is found in the lower half of the FSP area, and Douglas fir (Pseudotsuga menziesii) is only found in the offshore areas. Harvesting of this inventory will be conducted in a cost-effective manner that maintains the integrity of other associated resource values within the operating area. Harvesting techniques that maximize the economic, environmental and safe utilization of the timber resource will be encouraged.

The area covered by the North Coast FDU is dominated by wet coastal forests, made up primarily of hemlock, red cedar, cypress (yellow cedar), pine, spruce, and balsam. The pine is commonly known as shore pine and is rarely of a commercial quality. There is also a small component of Douglas–fir within the landbase, and deciduous (broad-leaf) species, of which cottonwood or red alder are considered to have commercial potential. Only a fraction of the land within the GBR North TSA is available for forest management. Harvesting of the timber within this area will be conducted in a cost-effective manner that maintains the integrity of other associated resource values within the operating area. Harvesting techniques that maximize the economic, environmental and safe utilization of the timber resource will be encouraged.

Consistency with the timber objective is achieved by confirming the need to reforest areas that are harvested, so there will be timber for the forest industry in the future. Periodically a provincial timber management goals, objectives and targets report is provided to Licensees from the CMNRD staff to

summarize the current "state of affairs" for the timber management targets for each TSA and TFL. These reports compare the differences between the harvest billing system (HBS) harvest data and the timber supply review (TSR) information to set goals and targets to focus on sustainable forest management.

The stocking standards in this FSP are based on established standards that have undergone extensive review, including the consideration of economically and ecologically viable species, and the forest health risks associated with those species. Commercial thinning stocking standards were added to this FSP. With the current level of information respecting the state of silviculture in the area, it is not expected that current forest management practices will change. TSRs reflect current management practices where the change in the regeneration delay is not expected to impact the timber supply.

The stocking standards in Section 5 of the FSP also address wildlife objectives by allowing reduced stocking and inter-tree spacing to allow preferred micro-site selection. These stocking standards address forage requirements for moose winter range and forage requirements for grizzly bears and black bears (only Kermode Stewardship areas within the GBR LUOR area).

An additional consideration for a viable timber industry is to ensure that there is a good mix of tree species within the forests of the FDU areas. This will allow for market response in the future, and creates forests that are healthier and more resistant to disease and infestations. The stocking standards referenced in the FSP include multiple species choices to allow achievement of this goal. In recognition of the value of cedar and cypress, both as an economic and a cultural species, where cedar and/or cypress is a preferred species in the stocking standard, reforestation efforts should be made to meet or exceed the original stand's proportion of these species as measured by the well-spaced trees in the new stand.

To maintain an economically viable timber profile, forest management must take into consideration those factors that can affect the health of the forest.

2.2.2 *Insects and Disease*

BCTS is committed to managing the health of forest stands. The primary forest health management objective is to maintain, recover, or enhance the short and long term productivity of the timber resource by minimizing losses caused by insect, disease, windthrow, and other damaging agents to levels that are socially and economically acceptable. As early detection is one of the keys to preventing major outbreaks, stands are assessed on a regular basis through periodic surveys by the Ministry of Forests. If an epidemic outbreak of insects or disease is detected, BCTS, in consultation with other agencies, will determine the appropriate course of action.

Deer *(Odocoileus spp.)* **and Porcupine** (*Erethizon dorsatum*) The main pests that are impacting the forests of the North Coast FDU are deer and porcupine. Deer will often browse young forests, with a preference for red cedar or yellow cypress. Porcupines prefer to feed on the bark of spruce and hemlock. Some methods to minimize porcupine damage are to plant a variety of tree species on a block and favour tree species less susceptible to damage during juvenile spacing activities. Less susceptible species may include western red cedar and spruce. The advisory footnotes to the stocking standards include the site series that are susceptible to deer and porcupine, allowing the prescribing forester to consider appropriate mechanisms to address potential browsing.

Spruce Leader Weevil (*Pissodes strobi*) is one of the more common pests in plantations, particularly in the Kitimat Valley and Terrace area. The current strategy is to limit the amount of spruce being reforested by planting or natural seeding depending on the leader weevil hazard. The hazard is dependent on the amount of leader weevil historically and currently found in an area and is classified as low, moderate or high. Another factor that influences how much spruce can be regenerated is the genetic properties of the seedlings that will be planted. If genetically resistant stock is used, then the amount of spruce managed can be increased. The thresholds for the amount of acceptable spruce according to hazard and genetic properties can be found in the stocking standards included in the FSP (Appendix I Table A8).

Hemlock dwarf mistletoe (*Arceuthobium tsugense*) is present throughout the CMNRD. It does not kill its host, but can affect the form of the tree, making it less valuable from a commercial perspective. However,

hemlock is well-adapted to living with mistletoe, growing well despite infestation: if the mistletoe is limited to the branches of a tree, it does not cause a significant degrading of timber quality.

Where mistletoe infection is significant, acceptable prescriptions may include avoiding reforestation with hemlock immediately adjacent to standing timber or cutting down tall residual stems (i.e., more than 3 meters high) in a harvested area. Since timber adjacent to cutblocks will have some level of infection it is difficult to eliminate mistletoe infection from managed stands. Highly productive sites have been shown to outgrow branch-infested mistletoe, making management of mistletoe less important in these areas.

Voles (*Microtus spp.*) can cause considerable damage to young plantations. When planting in areas where voles are known to be a concern, collars can be placed around the seedlings for protection. This is a high maintenance solution and has only proven effective in some cases. Retaining perch trees or installing artificial perching structures can encourage vole predation by raptors. Overall, however, the primary strategy is to align planting activities with the cyclical population cycle that voles typically follow. For example, fill planting may be prescribed for areas once vole populations are at the low end of their cycle.

Northern Pitch Moth (*Petrova albicapitana*), **Comandra Blister Rust** (*Cronartium comandrae*), and **Stalactiform Blister Rust** (*Cronartium coleosporiodes*) have been attacking some second growth pine stands in the Nass TSA. Since there are a number of pine leading second growth stands that are close to becoming free growing and reaching green-up, these pests are of concern. The Pitch Moth typically weakens the leader/main stem making the stem susceptible to wind and snow breakage. Cronartium rusts typically weaken and deform stems and have a higher probability of causing mortality. Because of the potential implications on second pass harvesting due to green-up constraints, stocking, wood quality, and growth and yield, FLNRORD's current plan is to conduct an overview flight to determine the extent and risk of an infestation, conduct a literature review on potential treatments, and then develop a management strategy. BCTS will follow the Ministry's activities closely.

Dothistroma Needle Blight (*Mycosphaerella pini*) has recently been of concern: many young pine plantations have been attacked. There has been an aggressive effort to inventory the attacked areas and set priority for treatment, which consists mostly of underplanting non-susceptible species. It is believed that Dothistroma is usually endemic in the forest, but a series of warm, wet summers, combined with the prevalence of young stands at a susceptible age, has allowed it to grow significantly. The Ministry of Forests has a program in place to address the hardest-hit stands, and for continued monitoring. In addition to monitoring existing plantations, another strategy is to limit the amount of pine planted into new plantations.

Mountain Pine Beetle (*Dendroctonus ponderosae*) have been attacking and killing pine stands within the Rosswood, Nisga'a Lands, and Lower Nass areas. Currently there are no epidemic populations within the BCTS operating areas. If epidemic populations do develop within the BCTS operating areas, then a strategy involving salvage logging and/or fall and burn may be necessary.

Tomentosus root rot (*Inonotus tomentosus*) and **Annosus root disease** (*Heterobasidion annosum*) is root diseases that naturally persist in forests throughout the CMNRD. Management strategies include harvesting the infested areas as part of normal cut block harvesting then reforesting the infection centers with less susceptible species. For Tomentosus root rot centers, Western Red Cedar, Sitka Spruce, and deciduous species are the preferred species to plant. For Annosus root disease centers, Lodgepole Pine and deciduous species are the preferred species to plant. Other viable treatments include stumping and knock over logging, but these practices are expensive and would generally make harvesting the area uneconomical.

2.2.3 Windthrow

Certain sites within the FSP area can be prone to windthrow due to characteristics in topography, soils or stand structure. Harvest plans can be designed to minimize windthrow events by recognizing sites where windthrow is likely to occur, and by considering strategies to reduce windthrow:

- Conduct windthrow assessments.
- Ensure the harvest boundary is located along a windfirm edge.
- Leave relatively straight boundaries; avoid sharp corners or indentations that are exposed to wind.
- Feather the forested edge and leave windfirm trees as a buffer adjacent to the harvest boundary.
- Topping and/or pruning in areas of high windthrow risk.

Harvesting of windthrow areas is based on a balance between the feasibility of harvesting the area and the protection of forest resources. Riparian areas need to be assessed for the level of risk to the aquatic environment including the maintenance of large woody debris, and the effects of windthrow on wildlife habitat values.

Windthrow is of general concern throughout the CMNRD. Strong inflow and outflow winds as well as localized gusting winds can produce significant amounts of windthrown timber. Of particular concern is the stability of residual timber in partial cut stands, interior reserves in clear-cut areas, and riparian reserve areas. BCTS manages windthrow by minimizing the occurrence and salvaging accessible windthrow.

1) Minimizing the amount of windthrow is achieved by taking into consideration the direction of prevailing winds and windthrow risk when prescribing silviculture systems and designing cut block boundaries. Feathering of susceptible block boundaries and wildlife tree patches has recently been prescribed and the effectiveness of this will be monitored once implemented. Also being considered is thinning tree crowns on block boundaries to reduce the amount of edge windthrow, particularly where windthrow may impact other forest resources such as fish habitat. Site specific measures will be determined during block layout and prescribed in silviculture prescriptions.

   The following are examples of tree characteristics that are considered when selecting wind firm trees and when designing a feathered edge:
   - small, open crowns
   - good root anchorage in deep, well-drained soils
   - no root or bole rot
   - low height-to-diameter ratio for stand (relatively large taper)
   - short trees
   - trees that have been growing in relatively open conditions
   - broad-leafed deciduous species
   - sound snags
   - sound, well-rooted veteran trees (e.g. dead top cedar)

2) Salvaging wind thrown timber where it occurs will be undertaken where economical. Areas of wind thrown timber larger than one (1) hectare in size are usually laid out and sold competitively. Where large blowdown events occur, adjacent susceptible timber is reviewed for its windthrow potential and high hazard areas may be proposed for harvests concurrent with the salvage of the wind thrown timber.

Removal of windthrow trees within riparian management areas (RMAs) will be considered where the integrity of stream banks will be protected. Where there are standing undamaged trees within RMAs, retention of these standing trees will provide a natural wind firm feathered boundary and provide valuable riparian habitat. Windthrow trees that have entered a stream channel will only be removed if they are determined to be negatively impacting the stream habitat and/or channel stability, or they can be removed without negatively impacting stream channel stability and water quality.

2.2.4 Fire Protection

Forests in the BCTS operating areas generally consist of decadent hemlock/ balsam stands with some areas containing minor components of spruce, cedar or pine. Logging slash, one of the most hazardous fuel types, can create a high fire hazard unless managed appropriately.

To minimize fire hazard, the following fuel management strategies may be used:

1) Salvage wind thrown timber wherever economical and environmentally practicable.
2) Pile roadside slash and landing accumulations concurrently with harvesting operations. Where possible, slash piles will be burned in the fall when there is a reduced fire hazard.
3) For regenerating harvested areas close to communities, extra strategies can be implemented. The target number of trees can be increased to promote self-pruning resulting in reduced ladder fuels. Deciduous species can also be utilized within the limits of stocking standards in Appendix I Table A1. For these communities Fire Management Areas will be determined by the Wildfire Management Branch in the future.

Prescribed burning is an option primarily used for different purposes such as reducing the duff layer, creating plantable spots or reducing fuel loads, or creating conditions for growth of early seral stage species (e.g., berries for First Nations cultural use). Currently, BCTS does not plan to use prescribed burning on any areas. If fuel loading becomes a concern or site preparation for reforestation is required, then broadcast burning may be an option.

In areas where smoke is a concern, such as around the Terrace Airport, BCTS will coordinate any hazard abatement with the appropriate organizations and/or individuals. The size and number of debris piles being burned at one time may be reduced in areas where smoke management is a concern.

2.2.5 Climate Change Adaption

To accommodate a changing climate, it is expected that tree species suited to lower elevations will migrate upwards in elevation and tree species at lower latitudes will move north. An example is that lower elevation suited Western Hemlock will move from the CWHws2 subzone where it normally grows to the higher elevation MHmm subzones. Modifications to the FSP incorporate recommendations from the Reference Guide for FDP Stocking Standards (202114): Climate-Change Related Stocking Standard (FLNRO, 2014; Draft 3.3). See section 5.1.17 of the FSP and Appendix I, Table A6 “Climate Change Adaptation” for more information.

2.2.6 Diversity, Ecological Resilience and Economics

The stocking standards are designed to establish a diversity of various commercial tree species across the landscape which is consistent with guidance from the Chief Forester. Establishing a diversity of species at the cut-block and landscape level is beneficial to mitigate immediate and long-term forest health concerns, such as biotic and abiotic influences. The overall goal is to manage for a range of preferred and acceptable species to support timber objectives. Another benefit of managing for a variety of tree species is the increase in the range of timber products to assist economic sustainability.

2.2.7 Partial Cutting

Partial Cutting (PC) is a harvesting treatment where the clear-cut silvicultural system is not suitable to achieve non-timber objectives (visual, etcetera). The result will be a specific amount of retention of overstorey trees will be left on the site. The overstorey trees may or not contribute to the future crop trees for the final cut at rotation. A best management practice is to leave as many crop trees remaining that will contribute to stocking. The strategy is to harvest enough timber during the partial cut entry for the operation to be economically feasible and to leave as many healthy, good quality trees as possible.

A diversified TSL portfolio will play a role in cutting the second growth timber profile as there may be a shortage of timber supply in the future. Suitable PC stands are ideally ones with a higher growing potential (higher site indexes) and higher tree densities. Higher densities provide volume that can be harvested in the short-term while leaving trees for continued growth for the final harvest. The FSP states the general conditions for PC, the stand conditions, and the stocking standards for Coastal and Interior forest types.

Other reasons for partial cutting would be to make open spaces within forest canopies for improved habitat for mule deer, moose, and other wildlife. Opening the forest canopy creates conditions suitable for shrub species to populate the ecosystem. Partial cutting also may be done to reduce fire hazard in and

around local communities (fire protection areas). Communities continue to grow in forested areas occupied by second growth forests and therefore increase the urban interface environment.

2.3 Wildlife

2.3.1 General Information

Under the FRPA, identified wildlife species that are at risk will be managed through an FSP, a Wildlife Habitat Area (WHA), Ungulate Winter Range (UWR) Order, or a General Wildlife Measure (GWM).

On May 6, 2004, under section 11 (now section 13) of the GAR, the Minister of Wildlife, Lands and Parks identified species at risk, regionally important wildlife, and ungulate species that require management. This list has been amended multiple times since 2004.

Strategies or results in the FSP that are prepared to be consistent with the wildlife objective are centered on habitat maintenance strategies that may sustain viable populations of native wildlife species within their natural ranges. Rare, endangered, or regionally significant species are to be protected or enhanced. The successful achievement of the wildlife objective is also linked to the implementation of biodiversity and riparian management strategies. For example, the establishment of riparian management areas, sensitive areas, old growth management areas, ecosystem networks and buffers, and group and single tree retention 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.

When a FPPR section 7 Notice of Habitat Attributes, Amount and Distribution is in place for a species, the FSP must describe strategies or results that are consistent with that Notice. If there is no Notice, strategies or results are not required. At times (e.g., as in the case of the Coastal Tailed Frog), WHAs or UWRs may address the required habitat attributes, amount and distribution, and then strategies or results are not required under an FSP.

In addition to the wildlife species identified through FRPA, there are also “red- or blue-listed” species identified through the Conservation Data Center (CDC), and these are also often referred to as “species at risk”. The CDC provides access to BC Species and Ecosystems Explorer that is a source for authoritative conservation information on plants, animals, and ecological communities (ecosystems) in British Columbia.

From the perspective of FRPA, the CDC wildlife species are not addressed in the FSP unless they are also identified under the GAR section 13 or if they have a legal objective established within an HLP. The management of species at risk within the BCTS Skeena Business Area, that encompasses the CMNRD in northwestern British Columbia, is driven by the *Species and Ecosystems of Management Concern, Management Guide* prepared by Crispin S. Guppy, R.P. Bio. in 2008 and updated in April 2013 and March 2017. This guide provides a summary for all the species of management concern in the BCTS Skeena area, including a risk assessment for those species in the context of BCTS operations, a summary of the legal/policy and biological issues for each species, a concise synopsis of important information for each species, and management recommendations for each species.

2.3.2 Species at Risk Identified through GAR

Of the species at risk identified under FRPA, American White Pelican, Ancient Murrelet, Bay-breasted Warbler, Bull Trout, caribou (Northern Mountain Population), Cassin's Auklet, Coastal Tailed Frog, Fisher, Great Blue Heron (fannini subspecies), Great Blue Heron (herodias subspecies), grizzly bear, Lewis's Woodpecker, Long-billed Curlew, Marbled Murrelet, Northern Goshawk (laingi subspecies), Northern Pygmy-owl (swarthi subspecies), Northern Red-legged Frog, Northern Saw-whet Owl (brooksi subspecies), Quatsino Cave Amphipod, Sage Thrasher, Short-eared Owl, Western Water Shrew (brooksi subspecies), White-tailed Ptarmigan (saxatilis subspecies), Wolverine (luscus subspecies), and Wolverine (vancouverensis subspecies) are identified as occurring within the CMNRD from the BC Ecosystems Explorer in March 2022.

Of the species at risk identified under FRPA, Bull Trout, Coastal Tailed Frog, Fisher, Great Blue Heron (fannini subspecies), Great Blue Heron (herodias subspecies), grizzly bear, Marbled Murrelet, Northern Goshawk (laingi subspecies), Wolverine (luscus subspecies), and wolverine (vancouverensis subspecies), have a high likelihood of interaction with forestry activities[3] within our FDUs and were identified as a high to very high risk based on the Guide to Species of Management Concern – Listing and Risk Matrices provided to BCTS in 2017.

Caribou (northern mountain population) may occur within the eastern reaches of the CMNRD, but according to information provided within the FOR website for Identified Wildlife, the potential range does not appear to overlap with planned activities in the BCTS FDUs.

As of March 2022, notices providing descriptions of the habitat area, distribution, and attributes for the identified species at risk in the CMNRD have been issued by the Minister responsible for the Wildlife Act for:

- Coastal Tailed Frog
- Grizzly bear
- Marbled Murrelet
- Northern Goshawk (*laingi* subspecies)

Notices for Bull Trout, fisher or Great Blue Heron, and wolverine have not been issued. Strategies or results for these species at risk are not required in the FSP. However, some of these species at risk have strategies or results in the FSP as they have related land-use objectives. With the WHAs, UWRs, strategies and results that address the marbled murrelet, and the other strategies within this FSP that address water and biodiversity issues, management is occurring that benefits all species at risk identified under FRPA.

2.3.3 Bull Trout

Bull Trout are cold water specialists, well-distributed across BC, particularly in the interior watersheds. Bull Trout have historically been confused with Dolly Varden and continue to be difficult to differentiate. There are three distinct life strategies with Bull Trout: full time stream residents; spawn in tributary streams and reside in lakes (adfluvial); spawn in tributaries, live in mainstream rivers (fluvial). There seem to be five habitat features that influence Bull Trout distribution and abundance: channel and hydraulic stability; substrate; cover; temperature; and the presence of migration corridors. Influences on habitat are likely to come from elimination of or restriction to habitat; sediment input; or habitat loss[4].

Although specific habitat amount, attributes, or distribution information for bull trout has not been established for the CMNRD, strategies and results in this FSP that are consistent with objectives set by government for biodiversity and riparian areas also serve to protect channel stability, substrate, cover, temperature, and connectivity, which will benefit the bull trout and other fish species. All streams that are designated as fish bearing are afforded appropriate protection through the default practice requirements under the FRPA.

2.3.4 Coastal Tailed Frog

The Tailed Frog is the only known stream breeding frog in Canada. It has two discrete distributions in British Columbia, occurring predominantly along the Coast Range (Coastal Tailed Frog), with a small population in the Southern Interior Mountains of the Kootenays (Rocky Mountain Tailed Frog). The Coastal Tailed Frog is currently yellow listed in BC meaning the species is apparently secure and not at risk of extinction. For coastal British Columbia, the Coastal Tailed Frog distribution coincides with the

[3] Forestry activities include planning and layout; roads, bridges and culverts; harvesting; silviculture, dryland sort and log unload; and water drop.
[4] IWMS: Accounts and Measures for Managing Identified Wildlife (2004) – Bull Trout

Coastal Western Hemlock (CWH) Biogeoclimatic Zone. The known northern limits of distribution are found in the CMNRD and are encompassed within BCTS' FDUs.

The Coastal Tailed Frog primarily inhabits headwater gullies of cool and permanent mountain streams. Creek size and fine sediment levels appear highly influential to tailed frog populations. The creek substrates and gully sidewalls must be relatively stable as events such as debris flows, and sediment laden floods impart a high mortality on larval populations. A stable creek has a low percentage of fine sediments with boulders and cobbles comprising the channel bed. This substrate provides tadpoles forage sites and cover from predators and bedload transport events. Adults will feed on terrestrial invertebrates at night, retreating under cover in or next to streams during the day. Bedrock types also likely play a significant role in tailed frog distribution with populations most prevalent in competent, coarse-grained intrusive rocks and scarce or absent in friable, fined-grained sedimentary rocks. Tadpole numbers also appear correlated to creek size, occurring in creeks ranging from 1 to 12 meters in width. Wider creeks have a greater carrying capacity and may more effectively flush out any sediment inputs[5].

The Coastal Tailed Frog is likely to occur in all of BCTS' planning areas, specifically where coarse-grained bedrock geology is present. Management of suitable habitat will revolve around the maintenance of natural stream channel sediment levels and transport regimes and the conservation of forested buffers along the stream. Strategies such as riparian reserves fall away and yard away techniques, machine free zones in riparian management areas, and ditchline sediment traps on roadways will be employed.

Since the Coastal Tailed Frog is dependent on small forest streams, the default riparian management area widths will capture a significant portion of the small forest stream habitat for coastal tailed frog (usually stream class 3, 4, 5, or 6). In addition, the Kalum LRMP and then the Kalum SRMP have identified special areas for the frog, culminating with the designation of ten Wildlife Habitat Areas (WHAs) within the CMNRD. The FSP does not provide strategies or results for tailed frog as this WHA designation has been determined to meet the required amount of tailed frog habitat required in the CMNRD. The goals of these WHAs are to ensure that there are legacy areas where stream stability, maintenance of water temperature, riparian habitat and microclimate, and coarse woody debris for adult frog dispersion are the focus[6]. General Wildlife Measures as described in the Identified Wildlife Management Strategy apply on these WHAs.

2.3.5 Fisher

Fisher is a large fur-bearing mammal of the weasel family with a wide distribution across the interior of BC. The CMNRD is on the fringe of fisher distribution. Fishers are solitary and do not interact with other fishers except at mating or as mothers raising their young. Fishers are omnivores but are preferentially carnivorous: their preferred prey is porcupine and hare. However, fisher will change their diet as necessary depending on prey availability. Most foraging occurs within mature or old-growth forests, though fisher may also make use of other forest types, depending on availability of prey. The key habitat features for fisher are availability of coarse woody debris, large wildlife trees, and canopy coverage in winter[7].

For fisher, the predominant impacts of clearcut logging are the reduction of canopy coverage and 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 default riparian practices in the FPPR provide for the maintenance of riparian management areas along streams, lakes and wetlands. Critical habitats for fisher are generally riparian associated, with suitable resting and maternal denning sites possibly being limiting factors. 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 (as well as marten and other furbearers) may avoid large openings (25 ha +) because of the lack of cover and susceptibility to being preyed upon by predators, therefore the maintenance of corridors or screening patches will

[5] IWMS: Accounts and Measures for Managing Identified Wildlife (2004) – Coastal Tailed Frog
[6] A Hetherington, MOE. Personal Communication, Jan 14, 2005
[7] IWMS: Accounts and Measures for Managing Identified Wildlife (2004) – Fisher

reduce sighting distances and link unharvested forest stands. The patch size distribution targets will also ensure that there are smaller openings. Wildlife tree retention patches typically include large veterans and deciduous species that provide important opportunities for denning and cover habitat, and they provide sources of coarse woody debris for resting and foraging sites.

The BC Fisher Habitat Working Group has developed numerous resources and tools to facilitate the identification, conservation, recruitment, and enhancement of fisher habitat in BC. The BC Fisher Habitat Working Group developed fisher habitat spatial data to provide quantitative guidance to help forest planners incorporate habitat needs of fishers into their forest planning decisions. When successfully integrated into the planning process, the spatial data will help planners make informed decisions of where and what to harvest (or avoid), while providing options to help maintain the habitats that fishers need within harvested stands and across landscapes. The spatial data identifies habitats that fishers require for denning and resting at stand and landscape levels. The spatial data provided by the BC Fisher Habitat Working Group is reviewed by the FSP Holder personnel for proposed blocks within the Nass FDU prior to layout activities occurring.

Fisher can also act as a representative furbearing species, so managing for fisher habitat will also provide some habitat value for other furbearers. This is a particularly important consideration for areas where trapping of wildlife is an economic or cultural consideration.

2.3.6 Great Blue Heron

The Great Blue Heron is dependent on lakes and ponds and is generally a lowland species. Following the default riparian management area widths, as referenced in the Water section of the FSP, especially with respect to protection around lakes, will capture a significant portion of this habitat.

Breeding habitat is often lowland sites with deciduous forest, preferably red alder[8]. These sites often overlap with Moose Winter Range areas, so it is expected that the strategies for moose will also benefit the Great Blue Heron.

2.3.7 Grizzly Bear

The grizzly bear is the second largest member of the bear family next only to the polar bear (U. maritimus). Grizzly bears historically occurred throughout British Columbia, except for some coastal islands (e.g., Vancouver Island, Haida Gwaii, and others). Populations are considered extirpated from much of south and southcentral British Columbia (e.g., lower elevations of the Okanagan, the Lower Mainland, and parts of the Cariboo). In British Columbia, grizzly bears are efficient predators and scavengers but rely more on a vegetative diet. Grizzly bears consume a wide variety of foods, including roots and green vegetation, small and large mammals, fish, and insects. A huge variety of plant, animal, fish, and insect food sources are regionally important. On the coast (MacHutchon et al. 1993; Hamilton 1987), beginning in the spring, grizzly bears feed on early green vegetation such as skunk cabbage (*Lysichiton americanus*) and sedges located in the estuaries and seepage sites that become snow-free first. As the season advances, the bears follow the receding snow up the avalanche chutes feeding on emerging vegetation and roots. Ripe berries attract the grizzlies down onto the floodplain and lower slopes where they eat devil's-club (*Oplopanax horridus*), salmonberry (*Rubus spectabilis*), raspberry (*Rubus spp.*), black twinberry (*Lonicera involucrata*), elderberry (*Sambucus spp.*), and a variety of blueberries (*Vaccinium spp.*). They begin to feed on salmon (*Oncorhynchus spp.*) as they become available in the spawning channels and continue to do so until late fall, feeding on live and eventually dead salmon. Once salmon supplies dwindle, grizzlies return to feeding on skunk cabbage and other vegetation. Grizzlies will feed on insects and grubs when the opportunity arises, as well as molluscs and other animals of the intertidal zone[9].

Within this FSP, management of grizzly bear habitat in the Kalum TSA, Cascadia TSA, Pacific TSA, TFL 1, and TFL 41 is achieved through grizzly bear WHAs. In addition, the Kalum SRMP grizzly bear identified

[8] IWMS: Accounts and Measures for Identified Wildlife (2004) – Great Blue Heron
[9] IWMS: Accounts and Measures for Identified Wildlife (2004) – Grizzly Bear

watersheds maintain forage within critical habitats. This means cluster planting and/or reduced stocking in several rich and wet ecosystems: the Stocking Levels for Managing Grizzly Bear Habitat as identified in the Kalum SRMP were used in the stocking standards in the FSP (see FSP Appendix 1 Table A2). When ecosystem classification identifies a complex (mappable or not) that contains at least 20% of an identified richer or wet ecosystem, the intent is that this area will be included in a standards unit that manages for grizzly bear habitat. The following recommended stocking levels from the Kalum SRMP facilitate grizzly bear forage in rich to wet ecosystems:

Table 2.3-1 Grizzly Bear Stocking Standards from Kalum SRMP

Coastal Western Hemlock (CWH) biogeoclimatic zone		**Free growing stocking standards**[10] (well spaced stems/ha)		
Subzone, variant	**Site association**[11]	**Target**	**Min.**	**Max.**[12]
vm1 and vm2	BaSs - Devil's club-(08)	600	400	660
ws1 and ws2	BaCw - Devil's club-(06)	600	400	660
vm1 and vm2 ws1 and ws2	CwSs - Skunk cabbage-(14 and 11) CwSs - Skunk cabbage-(11)	400	200	440
vm1 and vm2 ws1 and ws2	Ss – Salmonberry-(09 and n/a)) Ac - Red-osier dogwood-(10 and n/a) Ss – Salmonberry-(07) Ac - Red-osier dogwood-(08)	500	200	550

Other possible measures that would favor maintenance of grizzly bear forage or critical habitat types include:

- returning areas to a young seral state by harvesting at age class 4;
- opening the forest floor to more light and extending the window for forage production, thorough pre-commercial and commercial thinning, selection or variable retention harvesting, or pruning,
- acceptance of small not satisfactorily restocked (NSR) patches if they contribute to maintenance of forage,
- using prescribed fire to open the forest floor to allow more light and to create a nitrogen flush for forage production.

Consistency with this wildlife objective is achieved through BCTS':

- Adherence to the Grizzly Bear WHAs in the Kalum South and Nass FDUs
- Commitment to the maintenance of a natural level of grizzly bear forage within the grizzly bear watersheds identified in the Kalum SRMP
- Operations being consistent with the two objectives within the GBR Order for maintenance and protection of grizzly bear habitat and dens in the North Coast FDU

Grizzly bears are a wide-ranging species that depend on multiple, well-connected ecosystems, and/or on broad-scale ecosystem processes and functions, making them susceptible to cumulative effects from impacts of multiple activities on the land base. Grizzly bear is one value identified by the Province of BC under the Cumulative Effects Framework (CEF). An Interim Assessment Protocol has been published to provide an initial standard method for evaluating the current state of grizzly bears and their habitats across the province. This protocol has been used by the Skeena Sustainability Assessment Forum (SSAF) to produce a State of the Values Report in the Skeena Region. The Kalum South and Nass FDUs have

[10] Stocking levels for low bench floodplain site associations are not listed; site-specific prescriptions should be developed that account for the naturally low density of microsites appropriate for crop tree growth and high shrub cover
[11] The "well spaced" clause does not apply to forage gaps when stems are clustered as part of the silvicultural prescription. Crop tree sizes vs. competing brush standards are unchanged from existing regional guidelines. When determining the number of crop trees, minimum inter-tree distances, as stated in the silviculture prescription, still apply to trees within the cluster.
[12] If stand exceeds maximum density set in the prescription at free growing, these guidelines recommend spacing back to this stocking level.

some overlap with the SSAF assessment area. BCTS is involved with the SSAF Forestry Working Group to develop BMPs and other tools to address cumulative impacts to grizzly bears as well as other identified values.

2.3.8 Marbled Murrelet

The marbled murrelet is dependent on large trees within old forests for its nest sites. In addition to the old forest that exists outside of the timber harvesting landbase, BCTS' strategy which maintains the old growth proportion by landscape unit, will ensure that this old forest structure is maintained. This strategy will ensure a distribution of patch sizes is found on the landscape: this should reduce the amount of forest fragmentation, which is likely better for the murrelet[13]. In addition, under the GAR Order the Minister of Environment has identified numerous WHAs within the North Coast FDU that meet the habitat requirements for marbled murrelet.

The farthest distance that the marbled murrelet might be encountered from tide water is 80 km. The establishment of the Foch-Gilttoyees Park and its connectivity to the Gitnadoix Park result in a significant amount of old growth set aside from sea level to alpine that is well within the range of the marbled murrelet. The designation of old growth management areas (OGMAs) also provides old forest that may be potential marbled murrelet habitat.

Consistency with the wildlife objective is achieved by allowing for the establishment of a range of patch sizes and seral stages. This is shown to be of benefit to Marbled Murrelet, Northern Goshawk, and grizzly bear (as per IWMS habitat characteristics).

This strategy and result will allow a distribution of areas of different sizes (spatial) over an extended period of time (temporal). It is originally based on the established science of Natural Disturbance Types (NDT) and the temporal and spatial distribution of disturbance, as described in the Biodiversity Guidebook (September 1995). The analysis of patch and seral stages is as described in the guidebook, as updated by the Landscape Unit Planning Guide (March 1999) and supplemented by the provision for "site series groups" as defined in the GBR Order.

Over time it is intended that development within a FDU will move towards the patch size and seral stage distribution targets that are in place for NDTs and will be calculated separately for each LU that overlaps the FDU.

By meeting the requirements of the Kalum SRMP this strategy and result ensures that old growth will be retained over the landscape and allows the identification of specific stands to meet the requirements for old growth, which contributes to the habitat attributes for marbled murrelet, northern goshawk, and grizzly bear. This means that this strategy and result are also consistent with the habitat requirements for northern (Queen Charlotte) goshawk, and marbled murrelet, as described in the notices for these species under section 7 of the FPPR. Grizzly bear and moose will also benefit from a range of seral stages, particularly with respect to continued forage opportunities.

2.3.9 Goshawk

The Northern Goshawk (*Accipiter gentillis*) is a medium sized forest raptor that foragesmainly on squirrels, hares, and grouse. Their foraging behavior and breeding success requires specific attributes typical of late succession forests with natural openings distributed among mature-old stands with uneven canopy closure, structure and open forest floors. There are two distinct populations within BC. The Interior Northern Goshawks (*Accipiter gentillis subsp atricapillus*) are a mature forest landscape species in British Columbia. They are genetically distinct from the coastal *laingi* subspecies found on Haida Gwaii and coastal British Columbia. The coastal subspecies is red-listed and the interior species is blue-listed in BC. In 2018 an Implementation Plan for the Recover of Northern Goshawk, *laingi* Subspecies in BC was published. The Province prepares implementation plans to meet its commitments to manage and/or recover species at risk under the *Accord for the Protection of Species at Risk in Canada*, and the

[13] IWMS: Accounts and Measures for Identified Wildlife (2004) – Marbled Murrelet

Canada–British Columbia Agreement on Species at Risk. The recovery strategy outlined in the implementation plan was developed to maximize conservation efforts to benefit the Northern Goshawk, laingi subspecies, and to support current and future recovery efforts[14].

The CMNRD FSP overlaps the interior and coastal populations of the Northern Goshawk. Where the Kalum South FDU overlaps the interior population, BCTS Skeena implements a northern goshawk standard operating procedure (SOP), a bird nest encounters SOP, and a species of management concern SOP. All are available on the BCTS EMS website.

The Nass South SRMP identified Northern Goshawk as a species that will require management. As a result, the Nass South SRMP LUOR Order contains seven Goshawk related Objectives related to the maintenance of goshawk habitat (nest sites, post-fledging areas, foraging) and the timing of forestry related operations. A qualified biologist identifies the goshawk habitat that BCTS uses to implement the results and strategies identified under the goshawk objective within the Nass FDU.

2.3.10 Wolverine

The wolverine is not dependent on any particular habitat type. However, this carnivore is primarily a carrion feeder that often depends on ungulates as a food source[15]. As a result, the wolverine's range will often overlap with moose or mountain goat winter range, so it is expected that the strategies for moose and goat winter range will also benefit the wolverine.

2.3.11 Regionally Important Species

Under section 13(2) of the GAR, the Minister responsible for the Wildlife Act can identify regionally important species. As of March 2022, there have been no regionally important species identified for the CMNRD.

2.3.12 Specified Ungulate Species and Associated Ungulate Winter Range

Under section 13(3) of the GAR, the following ungulate species have been identified for which an ungulate winter range may be required:

- Mule and black-tailed deer
- Elk
- Caribou
- Thinhorn sheep
- White-tailed deer
- Bighorn Sheep
- Moose
- Mountain Goat

Only mountain goat and moose are identified as requiring ungulate winter range management in the CMNRD. Thinhorn Sheep are identified as requiring a specified area for disease protection in the Skeena Region.

2.3.13 Mountain Goat Ungulate Winter Range

The description of the area, distribution, and attributes of mountain goat UWR in the CMNRD correlate with UWR mapping for the area, and this mapping is shown on the FSP maps. Mountain goat UWR Orders have been established in all the FDUs covered under this FSP.

[14] Implementation Plan for the Recovery of Northern Goshawk, *laingi* Subspecies (*Accipiter gentilis laingi*) in British Columbia
[15] IWMS: Accounts and Measures for Identified Wildlife (2004) – Wolverine

The objectives of the Kalum LRMP for goat UWR are as follows:

1) Maintain winter forage areas adjacent to escape terrain that provides critical winter habitat.
2) Minimize human disturbances to goats on their critical winter habitats.

Important mountain goat habitat is known to occur throughout the CMNRD. Due to snow shedding properties, steep bedrock slopes with sharp ledges and overhangs, particularly southern exposures, are favored habitats to evade predators. Vertical ravines and canyons may serve as traditional seasonal movement areas.

As summer progresses, goats will move upslope to alpine meadow habitats to feed on shrubs, grasses, sedges, and forbs. Goat populations tend to condense 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 species such as coniferous trees, lichens, forbs, and mosses may be available. The rut may occur from late October to early December, with spring birthing and nursing in May or June typically being associated with extreme terrain. The over wintering and early spring birthing habitats are the most critical to goat populations and may be a concern for forest management and development activities.

The UWR polygons established in the various Orders for the CMNRD protect these areas of critical goat habitat and include measures for the protection and conservation of mature forest cover adjacent to identified escape terrain and seasonal movement areas. Forage production at lower elevations may be enhanced by encouraging canopy openings that will promote edge habitats and extensive live crowns in open canopy coniferous regeneration. Access restrictions and road deactivation measures are provided to limit motorized access by hunters in proximity to goat habitat. The FSP does not need to specify strategies and results for an UWR (see *General Wildlife Measures* section).

2.3.14 Moose Ungulate Winter Range

The description of the area, distribution, and attributes of moose UWR in the CMNRD correlate with UWR mapping for the area, and this mapping is shown on the FSP maps.

Moose UWR Orders have been established for all the FDUs under this FSP. The objectives of the Kalum LRMP for moose UWR are as follows:

1) Manage the Skeena, Nass, and Beaver Moose Winter Ranges to sustain the over-wintering moose populations
2) Maintain and where desirable, enhance the quality, quantity, and distribution of moose winter forage in the Skeena, Nass, and Beaver Moose Winter Ranges.
3) Provide a steady long-term supply and distribution of thermal cover in primary moose winter range.
4) Provide security habitat for wintering moose populations for identified primary and secondary moose winter range. Secondary winter range strategies will be based on operational feasibility.
5) Encourage forage production and maintain/ enhance forested thermal cover on secondary moose winter range.

The wildlife corridors identified for the Williams-Clore pass and the restrictions on the Kiteen-Cedar pass will provide protection for moose movement (as well as for other species).

Results and strategies for moose have been added to the FSP to address moose habitat and populations in the Nass FDU. No BCTS activity will occur in the Nelson and Willoughby Creek-Flat and White River Areas, roads and cutblocks within the wildlife migration corridor in the Nass FDU, identified on the FSP maps, will be developed with an evaluation by a professional wildlife biologist to ensure the integrity of the corridor is maintained. Mitigative actions, such as visual screens and limiting brushing and harvesting of important moose forage species, are also necessary within the moose ungulate winter range and Nass moose winter survey area as these are identified as being important moose areas.

Stocking standards specific to moose habitat have been added to the FSP for the Nass TSA for the wetter, richer growing sites in the ICHmc1, 1a, and mc2. The purpose is to manage these sites primarily for moose and secondarily for timber. An example practice would be to cluster plant conifer trees closer together and leave gaps for shrubs and other browse species.

2.3.15 Wildlife Habitat Areas

In accordance with Section 10 of the GAR, the minster responsible for the *Wildlife Act* can specify WHAs and objectives for WHAs. Approved WHAs in the Skeena region are listed at this website Approved Wildlife Habitat Areas (gov.bc.ca).

WHAs have been established in the CMNRD for coastal tailed frog, marbled murrelet, and grizzly bear. Where these areas fall within the BCTS FDUs, they are shown on the FSP maps. General Wildlife Measures (GWMs) as described in the Orders apply on these approved WHAs.

Specified areas for grizzly bear in the Nass TSA were established through of the Order 6-282 on October 20, 2014. Where these specified areas fall within BCTS FDUs, they are shown on the FSP maps. General wildlife measures as described in the Order apply on these approved specified areas.

2.3.16 Wildlife Habitat Features

In accordance with GAR Section 11, the Minister responsible for the *Wildlife Act* can specify wildlife habitat features. However, as of March 2022, there are no wildlife habitat features specified for the area covered by the FSP.

BCTS Skeena has developed a field guide to support the appropriate management of wildlife habitat features (BCTS Skeena Field Guide to Wildlife Management and Focal Species Identification) as they may be encountered in the field during the course of forest planning and development activities. Management recommendations are included for wildlife habitat features such as; wallows, mineral licks, large stick nests, bear and wolverine dens, cliffs, caves, talus and scree slopes and other high value habitat features. This field guide is readily available from the BCTS Skeena website as a key element of the Environmental Management System.

2.3.17 General Wildlife Measures

In accordance with GAR section 9, the Minister responsible for the *Wildlife Act* can specify general wildlife measures.

In June 2004, an updated version of the Identified Wildlife Management Strategy (IWMS) was released, providing an accounting of, and including general wildlife measures for, the management of species at risk identified in the May 6, 2004 notice.

The measures are considered and included in all site plans developed for BCTS operations:

- GWMs for Mountain Goat UWR were established in November 2005 through order #6- 001.
- GWM for Coastal tailed from were established in April 2005 through orders # 6-056 and 6-057.
- GWM for coastal tailed frog were also established in April 2006 through orders # 6-059, 6-060, 6-061, 6-062, 6-063, 6-064, 6-065, 6-066, and 6-067.
- GWMs for Marbled Murrelet were established in July 2010 through orders # 6-153, 6-154, 6-155, 6-156, 6-158, 6-160, 6-161, 6-164, 6-166, 6-170, 6-171, 6-174, 6-177, 6-179, 6-180, 6-181, 6-182, 6-183, 6-184, 6-185, 6-186, 6-187, 6-188, 6-280, 6-281.
- GWMs for Mountain Goat UWR in the Nass TSA + Upper Portion of Ningunsaw & Unuk Watersheds were established on December 12, 2008 through order # U-6-002.

- GWMs for Moose UWR in the Nass TSA were established on Sept 17, 2014, through order # U-6-018.
- GWMs for grizzly bear in the Nass TSA were established on October 20, 2014 through Order # 6-282.
- GWM for moose in the Kalum TSA, Cascadia TSA, Pacific TSA, TFL 1, and TFL 41 were established on May 2015 through order # U-6-009.
- GWM for moose in the North Coast TSA and TFL 225 were established on May 2015 through order # U-6-014
- GWMs for grizzly bear in the Kalum TSA, Cascadia TSA, Pacific TSA, TFL 1, and TFL 41 were established on June 18, 2018 through Order # 6-287.
- GWM for thinhorn sheep were established on August 2020 through order # SA-6-292.

2.4 Water

2.4.1 General Information

The focus of water resource management is on the maintenance of water quality and quantity for domestic, recreational, agricultural and industrial use, and for wildlife and fisheries needs. Under FRPA, the hydrological integrity of watersheds is protected, and riparian areas maintained. Actions such as the establishment of riparian management areas, machine free zones, fell and yard away techniques around watercourses, terrain stability assessments and prescriptions (e.g. to avoid moderate to highly unstable sites), riparian classification (e.g. to determine fisheries values) and total chance planning (e.g. to provide optimum road placements and to minimize the total amount of road), function to protect water quality.

Water quality and quantity also has value to the local fish populations. Fisheries values can be very high within the BCTS FDUs. Proper identification and classification of all riparian areas will enable protection of sensitive fish populations and habitats, and by extension, will also protect water quality. In the Nass South SRMP LUOR Order, areas have been identified as requiring special attention from a water management perspective. These areas are known as “Water Management Units” (WMUs).

Riparian classification of streams, lakes and wetlands will be initially identified at the planning level during field reconnaissance. Generally, at this planning level all streams are conservatively classified using BCTS’ stream inventory data and though a brief field review. Streams that connect to known fish-bearing streams without discernible obstructions, by default, are classified as fish bearing streams. Non-fish bearing stream reaches that are deemed to be especially important may be managed as fish bearing where appropriate. The streams, including fisheries values and riparian areas, are further assessed at the stand level during the development activities. Stream gradients, widths, and fish habitat suitability are confirmed on the ground at this time.

Water protection issues focus on the maintenance of water quality throughout the area in this plan. It is the intent of BCTS to conduct activities in a manner that minimizes any adverse effects on water quality and maintains the aquatic biological productivity of fish streams.

There are many ways to conduct development activities to minimize adverse effects on water quality:

1) For roads in a partially built state, maintain drainage and stability at season's end.
2) Conduct road construction operations during appropriate construction windows.
3) Conduct road construction operations in snow-free conditions (except winter roads).
4) Ensure adequate yarding deflection has been achieved during the engineering phase.
5) Conduct winter ground-based harvesting operations on frozen ground and/or sufficient snowpack in areas of wet ground and/or fine-textured soils.
6) Utilize site sensitive ground-based harvesting systems during summer operations where soil conditions dictate.

Immediate action will be taken to mitigate any adverse impacts on water quality and fish habitat that may occur during forestry operations. BCTS Skeena has developed BMPs for Water Quality, Erosion and

Sediment Control and these provide guidance when BCTS conducts forest development activities. These BMPs are an element of the EMS and are available from the BCTS Skeena website.

BCTS Skeena has completed Water Quality Effectiveness Evaluations (WQEE's) in select areas as a direct management action to evaluate for any potential water quality concerns that may be attributed to BCTS related forest activities. These assessments followed established protocols that were designed by experts and serve to identify and quantify sediment sources, the degree of impact to any affected natural drainage (a stream, wetland or lake) and determined management measures that would mitigate any adverse impacts that may have existed.

BCTS Skeena is also involved with the Skeena Sustainability and Assessment Forum (SSAF), a collaborative process working on environmental stewardship, Forestry Working Group that is focusing on creating data, best management practices (BMPs), and other management tools from environmental monitoring of fish and fish habitat, and wetlands.

2.4.2 Riparian Management Areas (RMAs)

RMAs are areas adjacent to streams, lakes and wetlands that are classifiable under FRPA. RMAs contain both high value timber and non- timber resources. Depending on the riparian classification, the RMA consists of a Riparian Reserve Zone (RRZ) and/or a Riparian Management Zone (RMZ). The identification and assessment of the RMA habitat and its incorporation into operational plans is critical to the management and conservation of riparian resources.

The objective of the RMA is to conserve intact riparian habitats across the landscape and to protect those plants, animals and ecosystems that are dependent on riparian habitats. All classifiable riparian features will have an RMA established and any forestry operations prescribed within the RMA will ensure the conservation of water quality, fish and wildlife habitat, and biodiversity.

Within the Nass FDU, BCTS has elected to not follow the defaults outlined in sections 47 - 51 but has elected to follow the defaults in section 52(2), and section 53 of FPPR, as noted in section 2 of the FSP. This is to allow the provision of a hydroriparian zone that is consistent with the Nass South SRMP LUO.

The provisions of FPPR s 47-51, as applicable in this FSP outside of the Nass and North Coast FDUs, can be summarised as follows (refer to the actual legislation for full details):

Table 2.4-1 Streams

Riparian Class	*Stream width*	*Fish stream*	*RMA - Riparian Management Area (slope distance)*	*RRZ - Riparian Reserve Zone (slope distance)*	*RMZ - Riparian Management Zone (slope distance)*
S1-A	*> 100 m*	*Yes*	*100 m*	*0*	*100 m*
S1-B	*20 - 100 m*	*Yes*	*70 m*	*50 m*	*20 m*
S2	*5 - 20 m*	*Yes*	*50 m*	*30 m*	*20 m*
S3	*1.5 - 5 m*	*Yes*	*40 m*	*20 m*	*20 m*
S4	*< 1.5 m*	*Yes*	*30 m*	*0*	*30 m*
S5	*> 3 m*	*No*	*30 m*	*0*	*30 m*
S6	*< 3 m*	*No*	*20 m*	*0*	*20 m*

Table 2.4-2 Wetlands

Riparian Class	*Wetland area*	*RMA (slope distance)*	*RRZ (slope distance)*	*RMZ (slope distance)*
W1	*> 5 ha*	*50 m*	*10 m*	*40 m*

W2	*1 – 5 ha (CWHxm/dm/ds)*	*30 m*	*10 m*	*20 m*
W3	*1 – 5 ha (other)*	*30 m*	*0*	*30 m*
W4	*0.25 - 1 ha (CWHxm/dm/ds); 0.5 – 1 ha (other)*	*30 m*	*0*	*30 m*
W5	*Complex of wetlands > 5ha*	*50 m*	*10 m*	*40 m*

Table 2.4-3 Lakes

Riparian Class	*Lake area*	*RMA (slope distance)*	*RRZ (slope distance)*	*RMZ (slope distance)*
L1-A	*> 1000 ha, or designated*	*0*	*0*	*0*
L1-B	*5 – 1000 ha*	*10 m*	*10 m*	*0*
L2	*1 – 5 ha (CWHxm/dm/ds)*	*30 m*	*10 m*	*20 m*
L3	*1 – 5 ha (other)*	*30 m*	*0*	*30 m*
L4	*0.25 - 1 ha (CWHxm/dm/ds) 0.5 – 1 ha (other)*	*30 m*	*0*	*30 m*

Where wildlife trees and/or wildlife tree retention patches are required to be retained within a cut block, the RMA will be reviewed for wildlife trees and/or wildlife tree retention patch designation prior to considering areas outside the RMA.

Part of the challenge when managing and conserving RMA habitat in the CMNRD is managing the risk of windthrow. In some cases, it may be more beneficial to clear cut immediately up to the riparian feature to avoid having retained timber blow down and negatively impact water quality or the habitat. In other cases, the habitat value may be high enough to warrant prescribing a wider RMZ than the minimum. Strategies for reducing the risk of windthrow will be considered where the windthrow risk in the RRZ is moderate to high. Any windthrow management strategy will consider the non-timber resource values in the RMA. BCTS Skeena has developed a BMP Windthrow Management as an element of the EMS.

Fall and yard away is employed where possible on S5 and S6 streams. Any yarding over fish streams will include full suspension or other measures that protect bank stability and do not introduce deleterious substances into the stream. Safety and windthrow potential will also be considered before prescribing retention of trees that cannot be felled and yarded away since in some cases controlled falling and yarding may have less impact on the stream's habitat than uncontrolled windthrow. Where falling and yarding away is not possible, actions will be taken to limit the impact on stream banks. This may include: falling trees across so that the butt log clears the channel or the stem spans both stream banks; lifting out only those portions of the stem that can be removed without damaging the stream channel; retaining portions of the log on site as large organic debris (as long as the remaining portion of the log does not obstruct stream flow or fish passage). If the stream is within a gully, then the management of the gully system must be assessed on a site-specific basis.

Stream clean-out will be considered where harvesting debris enters the high-water mark of a stream channel and has the potential to negatively impact either:

- stream bank or channel stability, or
- immediate or downstream water quality or fish habitat.

Where introduced harvesting debris is stable and will not negatively impact the riparian resource it will not be required to be removed.

When harvesting and/or debris removal is planned within a gully, a gully assessment can prescribe how to conduct operations within the gully.

RMA use for small streams (S4, S5, and S6) will be considered during the block layout and road design to ensure no spoil sites and debris piles are located with the RMAs for small streams. Where machine free zones (MFZ) have been prescribed no exposed mineral soil, displacement, or compaction will occur within the MFZ. On occasion, log decks may be operationally required to be located within the RMA, however prior to logging being completed all log decks will be removed from the RMA.

2.4.3 Lakeshore Management Zones

In accordance with the Government Actions Regulation (GAR) section 6, the Minister responsible for the Land Act can specify lakeshore management areas and objectives. However, as of March 2022 no lakeshore management zones have been established within the area covered by this FSP.

2.4.4 Community Watersheds

In accordance with GAR section 8, the Minister responsible for the Land Act can designate a community watershed, and the Minister can specify water quality objectives for a community watershed.

There are no designated community watersheds in the Nass FDU.

The following is a list of known community Watersheds in the Kalum South FDU and the North Coast FDU:

Table 2.4-4 Community Watersheds in the Kalum South and North Coast FDU and the community the water is supplied to:

Community Watershed	***Community Supplied***
Clear (Carlotta) Creek	Rosswood
Deep Creek	Terrace
Drake Creek	Thornhill
Eneeksagilaguaw Creek	Kitsumkalum
Gitzyon Creek	New Aiyansh
Hatchery Creek	Lakelse
Kas Miintl Am Hawak Creek	Gitwinksihlkw
Singlehurst Creek	Kleanza/ Usk
Skovens (Usk) Creek	Usk
Spring Creek	Terrace
Virginia Brook	Thornhill
Wathl Creek	Kitamaat Village
Axe Creek	Greenville
Stumaun Creek	Port Simpson
Shawatlan River-Woodworth	Seal Cove, Prince Rupert
Dodge Creek	Digby Island
Wolf Creek	Port Edward
Gabion [Dodge River]	Hartley Bay

2.4.5 Nass South SRMP LUOR ECA Thresholder for Watersheds

The Nass South LUOR Order identifies 32 watersheds as having ECA thresholds.

In addition, the Nass South LUO identifies the headwaters of several watersheds as “Water Management Units”. Streams and waterbodies in these headwaters are to be maintained in a “properly functioning” state.

2.5 Fish

2.5.1 General Information

The fisheries resource in the CMNRD District is an important resource in the area. Anadromous salmonids are found in nearly all main river systems. Non-anadromous salmonids are also present in most large creeks and rivers that have a low gradient (<20%). The resource supports a commercial, recreational, and a First Nation’s fishery.

Review of the objectives set by government for fish, as described in section 2.4 (Water, Fish and Biodiversity within Riparian Areas) of the FSP, shows that currently the only objectives are those set-in regulation: there are no objectives enabled by regulation, nor are there any land use objectives for the Kalum South FDU. The Kalum LRMP, while not a higher-level plan, provides some guidance with respect to water:

- Manage resource development activities to minimize negative impacts on surface and ground water quality for flora, fauna, domestic, commercial and industrial users.
- Manage human activities to maintain hydrological stability.
- Protect life and property from hydrological events.
- Manage human activities to maintain or enhance water quality and minimize water pollution.
- Manage lakes for water quality, fisheries, wildlife, recreation, and other resource uses.

Review of the objectives set by government for fish, as described in section 3.4 (Fish) of the FSP shows that there are objectives set-in regulation and land use objectives for the Nass FDU.

The Ministry responsible for the *Fisheries Act* and the federal Department of Fisheries and Oceans (DFO) are the government agencies responsible for managing the fisheries resource. These agencies have the mandate to ensure that the productive capacity of fish bearing waters is maintained. BCTS is committed to maintaining the aquatic biological productivity of all anadromous and resident fish bearing streams within the FDUs. This will be achieved through the identification of fish streams and proper planning designed to avoid damage to fish habitat.

Riparian inventories that provide riparian classifications within BCTS operations have been conducted. These assessments gathered existing information, local knowledge and topography, allowing the determination of riparian classifications. BCTS has erred on the side of caution when assigning classifications and it is likely that we have identified more fish bearing streams than actually exist. This classification strategy ensures a conservative approach to managing the fisheries resources. Block specific riparian assessments are also completed as required as part of the site plan fieldwork. These assessments will confirm overview riparian classifications as well as classify additional riparian features not found at the overview scale.

The authority to work in and about a stream is generally granted with terms and conditions attached which vary from region to region. Regional timing windows are identified at this website for freshwater: Regional Terms & Conditions & Timing Windows - Province of British Columbia (gov.bc.ca) and for Coastal regions: Projects Near Water - Timing windows to conduct projects in or around water (dfo-mpo.gc.ca) These timing windows provide guidance for limiting the risk to damage to fish or eggs in the streambed. In-stream work windows within the BCTS FDUs are highly variable as they are dependent on the species of fish present as well as the conditions specific to the site and the nature of the works. BCTS will work with

the DFO to ensure that appropriate timing windows and measures are followed when working in fish streams.

Road construction, modification, maintenance, deactivation and timber harvesting operations will utilize techniques required to minimize any sediment entering known fish streams or streams that flow directly into known fish streams.

During operations, BCTS will provide contractors with any special practices and measures to ensure stream bank integrity is maintained and fish habitat is protected. Regular road maintenance, repair and cleaning of debris from culverts and streams, and careful logging practices are all ways to ensure that fish habitat is not adversely impacted.

2.5.2 Riparian Management

Riparian areas occur adjacent to streams, lakes and wetlands. These include areas dominated by continuous high moisture content and the adjacent upland vegetation that exerts an influence upon them. Riparian management focuses on the maintenance of riparian zones for fishery, water and wildlife resources. The primary objective is to minimize or prevent impacts to these important resources.

The FSP provides two components for riparian management areas (RMA), i.e., riparian reserve zones (RRZ) and riparian management zones (RMZ) - see tables in section SD2.5 above. Usually, timber harvesting is not permitted in riparian reserve zones; however, harvesting can occur in riparian management zones although constraints may apply.

Riparian management for small stream (S4-S6) is addressed through the riparian assessment identified in Appendix X. The prescribing forester may alter the recommended management strategy for the purpose of conserving water quality, fish habitat, wildlife habitat, or biodiversity associated with riparian areas. Variances will be accompanied by a rationale and will be documented in the Site Plan.

2.5.3 Streams, Wetlands, and Lakes

The critical consideration for streams is maintenance of stream bank integrity. Generally, this is accomplished through the RMA, which is defined in the default criteria for riparian areas (as noted in section 2 and section 3 of the FSP). For streams without an RRZ, BCTS will maintain streambank integrity through careful logging practices (e.g. fall and yard away), location of machine-free zones, or retention of some amount of stems around the stream. This last method is commonly referred to as basal area (BA) retention. The amount of retention will vary for different stream types, but the most important streams that BA retention would apply to are S4 streams, as they are fish-bearing but do not have an RRZ.

For S1, S2, and S3 streams, no harvesting activity will be planned in the riparian reserve zones. A range of basal area retention in riparian management zones may occur depending upon the windthrow hazard. While the limits are defined in BCTS' results, the location of the retention is a site-specific issue and will be determined at the field layout stage. Reserve zones for S4, S5 and S6 streams are not required through *FPRA*, but may be established in order to maintain windfirm trees for streambank stability. This will also be assessed at the field layout phases.

Forest development may occur in proximity or adjacent to all stream classes (S1 - S6). However, S6 streams represent most of the streams encountered throughout the licence area. The basal area retention prescribed at the stand level (e.g., site plan) may vary and is dependent on a multitude of site specific factors, including:

1) Harvest system utilized.
2) Existing topography of adjacent wetted perimeter and upland ground.
3) Windthrow risk.
4) Timber soundness/safety concerns.
5) Stream/reach value.
6) Wildlife habitat value.

7) Erosion/sedimentation/stability risk.

Riparian management for small stream (S4-S6) is addressed through the riparian assessment identified in Appendix X. The prescribing forester may alter the recommended management strategy for the purpose of conserving water quality, fish habitat, wildlife habitat, or biodiversity associated with riparian areas. Variances will be accompanied by a rationale and will be documented in the Site Plan.

For all stream classes, BCTS does not attempt to address the level of basal area retention in riparian management zones in a spatially uniform manner. BCTS accomplishes riparian management zone retention by extending reserve (no harvest) zone boundaries into management zone areas. Extended reserve zones are a common occurrence since site specific factors, such as natural topographic features (e.g., top of gorge/gully) and stand structural changes play a significant role in the location of harvesting boundaries.

To manage and conserve the timber and non-timber resources within RMAs, various management prescriptions will be prescribed, and where timber harvesting is planned a variety of silviculture systems and/or treatments will be prescribed. As a minimum, the widths of RMAs will follow those specified in the FSP. Wider RMAs will be prescribed when required to manage and conserve high valued riparian habitat, e.g., a sensitive fish population, or to protect unstable stream banks. Site specific strategies will be determined during site plan and/or road layout and design preparation.

During the planning stage, streams, and riparian areas within or adjacent to proposed cutblocks and roads will be identified and classified. The location of fish bearing streams will be clearly marked on operational maps, and where necessary, appropriate machine free zones may also be prescribed. The FSP also provides for riparian reserves and riparian management zones.

The same approach to riparian zone boundary determination will be utilized for wetlands and lakes as described above. Stand structural changes and natural topographic features also play a key role in the location of management zone boundaries.

2.5.4 Fisheries Sensitive Watersheds

In accordance with section 14 of GAR, the Minister responsible for the *Wildlife Act* can identify a fisheries sensitive watershed and set objectives for such a watershed. However, as of March 2022, there are no fisheries sensitive watersheds in the area covered by the FSP.

Objectives for fisheries sensitive watersheds in other areas have been reviewed by BCTS Skeena since they are relevant to the appropriate management of numerous watersheds within the FSP area that are known to have high fisheries values. These objectives generally rely on provisions to limit the equivalent clearcut area within subject watersheds and to limit the potential for fine sediment production associated with forest roads that may adversely affect water quality. This FSP includes specific results and strategies that relate to limiting the equivalent clearcut area in applicable watersheds and there are also broadly applicable results and strategies in effect for most of the FSP area related to seral stage distribution that will serve to limit the rate of harvest in a manner similar to ECA thresholds.

2.6 Biodiversity

2.6.1 General Information

Biodiversity (biological diversity) is the diversity of plants, animals, and other living organisms in all their forms and levels of organization, including genes, species, ecosystems, and the evolutionary and functional processes that link them. Two levels of biodiversity are considered: landscape level and stand level. At the landscape level, watershed areas are amalgamated into Landscape Units, which are assigned either a low, medium, or high biodiversity emphasis in which “high” has the greatest importance for managing and conserving biological diversity. Stand level biodiversity is more site specific and includes the requirement to have wildlife tree retention areas across the landscape, but also may include designating old growth management areas (OGMAs).

2.6.2 *Ecosystem Based Management and Sustainable Forest Management*

Ecosystem Based Management (EBM) is an approach to managing human activities in a manner intended to ensure the coexistence of healthy, fully functioning ecosystems and human communities and is directly related to sustainable forest management. Adaptive approaches to managing forest ecosystems are expected to be required to ensure the long-term benefit of present and future generations. In the context of this FSP, EBM approaches are explicitly incorporated where there are applicable FRPA objectives that are described as being ecosystem based, such as those within the GBR Order and specific objectives in the Kalum SRMP (e.g., old forest retention in undeveloped watersheds).

Ecosystem based and sustainable forest management approaches are also integral within all applicable land use plans that have informed the preparation of this FSP. Objectives related to biodiversity (landscape and stand level); riparian habitats, wildlife and cultural heritage resources all contain elements of these approaches. BC Timber Sales has endorsed these approaches at the provincial level and maintains certification to the Sustainable Forest Initiative management standard (SFI Certification). Many requirements of the SFI standard exceed those that are within FRPA objectives and, as such, BCTS has programs and practices in place that are not fully described in this FSP. The BCTS Sustainable Forest Management Plan is available from the BCTS website.

2.6.3 *Landscape-level Biodiversity*

A fundamental component of landscape level biodiversity is the landscape unit, and planning at the landscape level requires the determination of biodiversity emphasis for these LUs. Biodiversity emphasis assignments outline three broad options (low, intermediate, high) that reflect the provision of different levels of natural biodiversity for select landscape units. The Kalum SRMP describes the biodiversity emphasis for LUs within the SRMP area. The *Order Establishing Provincial Non-Spatial Old Growth Objectives*, effective June 30, 2004, established landscape units (LU) and biodiversity emphasis for each LU. The Nass South LUOR Order describes the biodiversity emphasis for LUs within the Nass South SRMP area. These biodiversity emphasis assignments consider management opportunities and objectives for known resources and seek to balance risks to biodiversity against the social and economic objectives of the crown at a provincial level.

2.6.4 *Old Growth*

The *Order Establishing Provincial Non-Spatial Old Growth Objectives*, effective June 30, 2004, establishes LUs and biodiversity emphasis for each LU and retention levels for old growth by NDT. The Order requires an analysis of each LU with respect to the amount of old growth remaining by BEC.

Within most of the Kalum South FDU the old growth targets in the order have been superseded by Objective 3 of the Kalum SRMP, which establishes the spatial designation of old growth management areas (OGMAs) in the Kalum SRMP. Exceptions to this include the Kowesas Landscape Unit and the Undeveloped Watersheds listed in the Kalum SRMP (Jesse, Emsley, Wathlsto, Hugh, Brim, Wahoo, and Owyacumish). Draft OGMA's have been identified within the Kowesas Landscape Unit and BCTS will manage these in a manner consistent with those that are legally established. Within the Undeveloped Watersheds listed in the Kalum SRMP, OGMA's have not been identified and EBM provisions have been described in the SRMP. These provisions had their origin in the Kalum LRMP, which recommended piloting an EBM approach that would be founded on representation of old forest at the site series level, rather than through discreet OGMA's. Old seral forest in these areas is managed through non-spatial targets and relies on Predictive Ecosystem Mapping (PEM) for identifying the site series present and the subsequent amount of old forest to be retained. The SRMP describes that the risk to biodiversity of this approach is considered low in these areas due to the degree of contribution to the targets from portions of these watersheds that are not considered to be in the timber harvesting land base.

Old growth in the North Coast FDU is managed in a manner similar to the Undeveloped Watersheds and the Great Bear Rainforest Order specifies provisions that rely on the representation of old forest at the site series level (site series groupings are relied on) and these are identified through a combination of Terrestrial Ecosystem Mapping (TEM) and PEM. Within the Nass FDU, the non-spatial old growth order

applies to the landscape units that are not within the Nass South SRMP. Within the Nass South SRMP area, old growth management areas have been delineated in a manner consistent with the applicable targets for old forest retention

With respect to patch size targets[16], these are informed by considering that at the landscape level, natural openings will develop over time. These openings would be of various sizes, depending on how they originated (fire, wind, landslides, and avalanches). A forest management approach taken in this FSP is to provide for a distribution of different sized openings over time: i.e., a temporal and spatial distribution of blocks. Cutblock design, including size, shape, and pattern, will promote a range of small to medium sized, similarly aged forest patches on the landscape. Small scale disturbances will be mimicked through dispersed small clearcutting 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 an historic influence. In areas of dispersed harvesting, the size range of leave areas will approximate that of harvested openings. Landforms, features and site sensitivity to development will be considered in cutblock design.

2.6.5 Cutblocks or Patches Larger than 60 Hectares

BCTS has elected to exempt itself from practice requirement (FPPR s 64(1)) that restricts cutblock size to a maximum size of 60 ha. BCTS has adopted FPPR ss 64(2) (a) (ii) and (2) (b) which ensures that BCTS' harvesting is consistent with the structural characteristics and the temporal and spatial distribution of openings that would result from a natural disturbance.

2.6.6 Coarse Woody Debris

Coarse woody debris (CWD) is important for many types of organisms in order to maintain a presence within the area. The timber stands within the FSP area are predominantly overmature and decadent. These overmature stands exhibit various stages of decay, which contributes to higher amounts of CWD on the site prior to harvesting activities. The nature of these forests means that a high level of non-merchantable material is typically left on site. During harvesting, additional breakage of trees occurs and is often left on a site, as most is unmerchantable.

Thriftier second growth stands will retain less CWD after harvesting compared to the typical over mature hemlock/balsam stands in the CMNRD. Managing the recruitment of CWD is most important within managed second growth stands where CWD may be otherwise limited. Required levels of CWD retention are described in section 68 of the FPPR.

Where site occupancy and fire hazard are not significant concerns, BCTS will attempt to avoid practices such as piling and burning (except for landings) and will not conduct broadcast burning within the FSP area. These actions will provide essential habitat for those organisms that are dependent on coarse woody debris. BCTS Skeena has developed a BMP for CWD management. This is used to guide BCTS staff on appropriate management practices related to the quantity and quality of CWD and consideration of regulatory requirements.

2.6.7 Stand Retention, Wildlife Trees

At the stand level, important stand structural attributes will be preserved through the retention of wildlife tree patches and individual wildlife trees. Snags, culls and veterans provide valuable habitat for cavity nesting birds, raptors and small mammals while contributing to vertical density. Measures that are listed under section 2.3 (wildlife), 2.4 (water), 2.5 (fish) and 2.6 (biodiversity) of the supporting document contribute to the management of biodiversity.

To achieve stand level biodiversity objectives within the Kalum South FDU, wildlife tree retention follows the guidance from Table 6 in the Kalum SRMP, April 2006. In accordance with this table, the amount of individual wildlife trees or groups of trees in WTRAs to be retained within cutblocks and/or adjacent to

[16] As identified in the Kalum SRMP, the Nass South SRMP, and the biodiversity guidebook.

cutblocks is described by LU. The retention amounts in the SRMP were directed by the Kalum LRMP and allow for the retention amount to be calculated over a "harvest unit" – a grouping of blocks that are close to each other. In the Nass FDU, the use of the defaults is consistent with the Nass South SRMP LUOR Order.

WTRAs are planned on a site-specific basis and usually identified first during the reconnaissance phase of block layout. Wherever possible, WTRAs will be located based on the priorities identified in the FSP. These priorities are based on the *Wildlife Tree Retention – Management Guidance* provided by the Ministry of Forests Microsoft Word - WT Guidance May 2006.doc (gov.bc.ca) and identified in Appendix XI.

The following are characteristics and habitat attributes that are looked for when evaluating the wildlife habitat of individual trees:

- internal decay,
- crevices,
- large brooms,
- active or recent use,
- current insect infestation,
- large nests,
- hunting perch,
- bear den,
- largest tree on site,
- locally important tree species.

Areas with a range of tree species and sizes will be prescribed for WTRA designation before areas with a simple stand structure. WTRAs will be designed to protect those trees with valuable wildlife tree attributes. If there are no wildlife trees within or adjacent to a cutblock then WTRAs will be located for long-term recruitment of wildlife trees and/or CWD, or as a minimum be representative of the pre-harvest stand conditions. This may result in the inclusion of both deciduous and coniferous species in the WTRA. Where practicable, WTRAs will be in areas that would contribute to the conservation of rare plant communities and ecosystems.

WTRAs will be located and designed to reduce the risk of windthrow. In high windthrow risk areas, WTRAs will be designated in the most wind firm timber, or WTRAs will be designated in areas of lower habitat value but in a more wind firm location. Timber with a relatively low height to diameter ratio will be identified for WTRA designation wherever practicable. It is expected and biologically acceptable to have some windthrow on the fringe of WTRAs.

WTRAs should be retained for a minimum of one rotation. Minor salvage will generally not occur in WTRA areas, but if there is to be some salvage of a WTRA, it will be replaced with equivalent suitable habitat as close to the original WTRA as possible. Since one of the objectives of retaining WTRAs is to recruit future CWD, WTRAs will not be replaced if they are subject to windthrow and not salvaged.

BCTS Skeena has developed BMPs for Stand Level Retention as a key element of the EMS and this document is readily available from the BCTS Skeena website.

2.6.8 Red- and Blue-listed Ecological Communities

The Nass South SRMP LUOR Order speaks to red- and blue-listed ecological communities management. BCTS references the Nass South SRMP LUOR order schedule E and F as well as the BC Ecosystem Explorer to identify the red- and blue-listed that may overlap our operations.

2.7 Cultural Heritage Resources

2.7.1 BCTS Skeena Cultural Heritage Resource Evaluation Process

Cultural heritage resource (CHR) management is a complex and evolving aspect of forest management in BC, and it relies on an understanding of what these values are and where they are located on the land base. CHR's are defined within the *Forest Act* as "an object, a site or the location of a traditional societal practice that is of historical, cultural or archaeological significance to BC, a community or an aboriginal people." The *FPPR* sets out the following objective: "to conserve, or, if necessary, protect cultural heritage resources that are:

1) The focus of a traditional use, by an aboriginal people, and that are of continuing importance to that people; and
2) not regulated under the *Heritage Conservation Act*."

The *FPPR* also sets out factors (FPPR Schedule 1) that may be considered in determining whether the CHR management strategies will be appropriate. In this forest management context, CHR's have both archaeological and non-archaeological components. The non- archaeological component must be addressed through suitable results and strategies as established within FSPs. The FSPs for the Skeena Business Area have adopted strategies that rely on information sharing with First Nations in support of conducting a CHR Evaluation for proposed developments and developing appropriate management strategies.

CHRs include aboriginal interests and traditional practices, and archaeological sites. Aboriginal interests and traditional practices generally include the use of lands for specific activities integral to the culture of First Nations. Archaeological resources are sites that contain evidence of past human activity. The Forest and Range Evaluation Program (FREP) has made the statement that "Although there are some commonalities, each First Nation in BC has a unique interpretation of what the CHR value represents." Given this broad nature of CHR's, there are no pre-established qualification criteria that can be relied on by the Business Area to fully support all aspects of CHR management. For the archaeological subset of CHR's there are trained archaeologists that can be relied upon to meet this need, but for the non-archaeological CHR subset, there are no readily available or developed standards that would address training and qualification requirements. There is also no comprehensive source of information on the nature and location of CHR features that may be relied upon to support identification in the field, including factors such as the relative importance, abundance, or historical extent of use.

Given these deficiencies and the need for BCTS to satisfactorily deliver on CHR management, the Skeena Business Area involves those individuals that present a significant opportunity to effectively identify and locate these CHR features within proposed development areas – the field workers employed by BCTS. BCTS staff ensures that there is a functional level of knowledge and understanding by the field workers employed by BCTS, with regards to CHR identification for the site(s) to be evaluated. BCTS staff also ensures there is effective information sharing with First Nations to support the CHR Evaluation process and in order to develop effective management strategies for CHR's.

At a minimum, the following information is reviewed and understood by the BCTS Skeena Business Area Planning Foresters, Practices Foresters, Operations Technicians and contract field workers involved in CHR Evaluations and the development of management strategies:

- BC Archaeological Resource Management Handbook for Foresters (March 2007, Archaeology Branch, Ministry of Tourism, Sport and the Arts) http://www.tca.gov.bc.ca/archaeology/docs/handbook_for_foresters.pdf
- Culturally Modified Trees of BC – A Handbook for the Identification and Recording of Culturally Modified Trees (2001, BC Ministry of Forests) http://www.tca.gov.bc.ca/archaeology/archaeology_professionals/cmthandbook.pdf

The Skeena Business Area has developed a Cultural Heritage Resource Evaluation (CHRE) Process that identifies the evaluation procedure to follow for all proposed developments. A summary of the key elements of this process and the BCTS staff responsibilities is as follows:

- An office-based review of all proposed developments is completed against the cultural heritage resource knowledge base maintained by the Business Area. This knowledge base includes Archaeological Inventory Assessments, Traditional Use Studies, Cultural Heritage Resource Inventories, priority botanical plant species, and priority wildlife habitat features, and previous information provided during consultation. The focus of this office-based information review is on the identification of known or indicated / potential CHR's. The results of the information review are described on the CHR Pre-Harvest Evaluation Form within the Block / Road Summary section of the form. This is done to support the communication needs of those involved in the CHR Evaluation process.
- The results of this information review are provided to the Practices Forester / Operations Technician responsible for further development.
- The Practices Forester / Operations Technician oversee the completion of the field-based portion of the CHR Evaluation. This is typically completed by the block and / or road layout and development contractor in the normal course of their field duties, but it may be conducted by BCTS personnel.

2.7.2 Traditional Uses and Activities

2.7.2.1 BOTANICAL PLANTS

If specific areas can be identified that have a cultural value as plant gathering sites (e.g., berry picking), there is the potential to address them through a result or strategy – therefore it is important to discuss and determine the expectations for management of the sites. Alternatively, if plant gathering is determined to be a landscape level value, then there may not be a site-specific result necessary, but a seral stage requirement instead to ensure that opportunities for plant gathering continue over the long-term. Where specific plants can be identified that have a cultural value, information on the cover and vigor within the blocks is collected and provided through the CHRE process.

Gathering of Cedar bark falls within this category, and is a significant activity carried out by First Nations that often resulted in CMTs.

2.7.2.2 CEDAR

All of the First Nations within the CMNRD have identified cedar (Western Red Cedar) as a tree species of continuing cultural importance. The primary desire has been to ensure that cedar is maintained on First Nation traditional territories in amounts and of the proper attributes to allow ongoing cultural use.

Cedar provides a valuable resource for traditional cultural activities: bark provides textiles, and the logs provide building materials (canoes, planks) and spiritual materials (totem poles). The stocking standards in this FSP prescribe cedar where ecologically appropriate, so a continued supply of trees for bark stripping purposes is ensured, as is the supply of lumber (the modern form of planks). However, to ensure the supply of larger logs for canoes, planks, or poles, an FSP result has been prepared to ensure that in forest stands that have cedar retention in WTRAs and RMZs, removal of some of these stems for cultural purposes is an acceptable activity. This provides a method for ensuring that a supply of raw materials for traditional cultural heritage activities will be maintained.

The CMNRD has a range of parks and protected areas, and has spatially identified old growth areas. These areas will allow First Nations sustenance and traditional and cultural uses to occur on a substantial land base. This ensures that Cedar is represented across the landscape.

2.7.3 Culturally Modified Trees (CMTs)

Culturally Modified Trees (CMTs) can include any tree that has been modified through human activity. However, for the purposes of the FSP, a CMT is considered to be a tree modified through a cultural activity of a First Nation. These trees are split into two classes: pre-contact (i.e., before 1846) and post- contact (after 1846). There is limited discussion of pre-contact CMTs in the FSP as they are archaeological features and are protected and managed by the *HCA*. Post- contact CMTs, however, have no formal protection or designation unless otherwise addressed by an established objective i.e.: GBR Order. Several First Nations have internal policies on post-contact CMTs, most including some level of protection and buffering.

2.8 Recreation Resources

2.8.1 General Information

According to the FRPA, the FSP must still provide strategies and results to be consistent with the higher-level plan objectives that have been established on recreation sites and trails. Therefore, responsibility for approving the strategies or results still rests with the DDM of the Ministry responsible for recreation sites and trails.

BCTS operations will not negatively affect identified recreation resource values within our operating areas. We will maintain the recreation resource by complying with the higher-level plans established for the network of recreation sites and trails in the CMNRD. We will minimize the impact BCTS timber harvesting operations may have on high value recreation areas by assessing the potential impacts and prescribe mitigating measures where necessary and practical. Where BCTS operations are within proximity to established recreation sites and trails, the Recreation Officer is contacted to develop a plan with BCTS that is consistent with the management objectives. If necessary, measures to protect specific recreation features and resources will be identified in the site plan. BCTS operations proposed within or adjacent to established sites and trails with legally established objectives will be consistent with the management objectives (Higher Level Plans) for these features. Generally, this means no harvesting activities will occur within 10 metres of the feature. If additional measures are required to conserve the value of the recreation feature, and where practical, partial cutting or additional buffering may be used adjacent to the 10-metre reserve. These activities will be developed in communication with the DDM (e.g. Recreation Officer) for the Ministry responsible for the trail.

2.8.2 Recreation Sites and Trails with Higher Level Plan Objectives

Under GAR two orders were implemented, in 1995 and 1996, to establish legal management objectives for certain recreation sites and trails. BCTS operations will follow the management objectives and measures to protect the recreation resource. These activities will be developed in communication with the DDM (e.g. Recreation Officer) for the Ministry responsible for the trail

2.9 Resource Features

2.9.1 General Information

Section 5 of the Government Actions Regulation allows the identification of the following as resource features:

- surface or subsurface elements of a karst system;
- a range development;
- Crown land that is being used for research or experimental purposes;
- permanent sample sites used as snow courses by the Federal or Provincial government for the purpose of measuring the water content of the snow pack on a given area;

- a cultural heritage resource that is the focus of a traditional use by an aboriginal people and that is not regulated by the Heritage Conservation Act;
- an interpretative forest site, recreation site or recreation trail;
- a trail or other recreation facility referred to in section 56 [interpretive forest sites, recreation sites and recreation trails] of the Act that is authorized by the minister or under another enactment;
- a recreation feature that the minister considers to be of significant recreational value.

Cultural heritage features are covered under SD section 2.7.

Interpretative forest sites, recreation sites, and recreation trails, including a trail or other recreation facility referred to in section 56 of the FRPA, or a recreation feature that the minister considers to be of significant recreational value, are covered under section 2.8 of this document.

Strategies or results are not necessary or required to provide strategic management of the remaining resource features.

As of March 2022, for the area covered by this FSP, no resource features have been identified under GAR s.5 with respect to:

- surface or subsurface elements of a karst system;
- a range development;
- Crown land that is being used for research or experimental purposes; or
- permanent sample sites used as snow courses.

2.10 Visual Quality

2.10.1 Preamble

In some cases, VQOs appear to have been assigned to areas outside of Known Scenic Areas (KSA); however, it is important to recognize that a Visual Impact Assessment (VIA) is only required for operations within the area with an established VQO. There are areas within the CMNRD without established VQOs; however, a VIA is not legally required for those areas. There are situations where a VIA may not be legally required; however, BCTS may voluntarily conduct a VIA in order to be good stewards of the landbase.

Refer to the Visual Impact Assessment Guidebook for guidance, although it is no longer cited in regulation.

2.10.2 Definitions

Altered forest landscape categories – are defined in this FSP according to the FPPR s.1.1 as:

1) *Preservation* means consisting of an altered forest landscape in which the alteration, when assessed from a significant public viewpoint, is very small in scale, and not easily distinguishable from the pre-harvest landscape;
2) *Retention* means consisting of an altered forest landscape in which the alteration, when assessed from a significant public viewpoint, is difficult to see, small in scale, and natural in appearance;
3) *Partial Retention* means consisting of an altered forest landscape in which the alteration, when assessed from a significant viewpoint, is easy to see, small to medium in scale, and natural and not rectilinear or geometric in shape;
4) *Modification* means consisting of an altered forest landscape in which the alteration, when assessed from a significant public viewpoint, is very easy to see, is large in scale and natural in its appearance, or small to medium in scale but with some angular characteristics; and,

5) *Maximum Modification* means consisting of an altered forest landscape in which the alteration, when assessed from a significant public viewpoint, is very easy to see, and is either very large in scale, rectilinear and geometric in shape, or both.

Cutblock – means a specific area of land within which timber is to be or has been harvested

Damaged timber – means timber damaged by naturally occurring abiotic and biotic processes, including windthrow, fire, insects and disease.

Visual Impact Assessment (VIA) – means a process, the result of which will indicate whether or not a proposed alteration:

1) meets the basic definition of the Visual Quality Objective or visual quality class category as described in section 1.1 of the FPPR,
2) has been assessed from a significant public view point, and
3) considers the design and scale from the perspective view.

Visual Quality Objective (VQO) – means:

1) an objective continued, in respect of a scenic area, under section 181 of the FRPA;
2) an objective established for a scenic area under the Government Actions Regulation; or
3) a visual quality class (VQC) continued, for a scenic area, under section 17 of the Government Actions Regulation.

Visual Sensitivity Class – means a visual sensitivity class established on or before October 24, 2002, particulars of which are publicly available in the BC – Data Catalogue maintained by the minister responsible for the Land Act.

2.10.3 General Information

The Ministry of FLNRORD has completed a landscape inventory for the majority of the District. Visual quality objectives (VQOs) are objectives defining an acceptable level of alteration to a specific visual landscape unit based on the physical characteristics and public concerns.

On May 18, 2006, the District Manager confirmed the establishment of Scenic Areas and Visual Quality Objectives throughout the North Coast FDU. Prior to any development in a known scenic area, the planned development is reviewed to assess the potential impacts on the visual resource:

- Zone 1: Inside Passage
- Zone 2: Skeena River Corridor
- Zone 3: Portland/ Work Channel
- Zone 4: Douglas/ Gribbell

One portion of the Zone 3 scenic area does not have a VQO or a VSC, but has been identified as an area of visual importance by the Nisga'a Lisims Government, as it is directly visible from the village of Gingolx.

If future scenic areas are established that do not have visual quality objectives, visual sensitivity classes which will be used as a surrogate, as follows:

Visual Sensitivity Class	***Managed to a Visual Quality Objective of:***
1	Retention

2	Partial Retention
3	Modification
4	Modification
5	Maximum Modification

The North Coast LRMP recommended a completely different method for managing visual resources. However, there have been several issues identified with this recommendation. Until a legal decision is made on this recommendation, the currently accepted procedures for visual management will be followed.

VIAs will be completed where BCTS development is proposed within visual polygons in known scenic areas. VIAs will be used to illustrate that the VQO will be met for BCTS operations. To maximize timber development in scenic areas, BCTS will use visual landscape design techniques when designing cut blocks in highly sensitive areas. Properly designed blocks will blend development into the natural landscape. Where visual landscapes are highly sensitive, a variety of silviculture systems will be prescribed to minimize the visual impact. It is worth noting that the definition of a viewpoint as used in the FSP makes mention of the "posted/ normal" speed. This is easily measured on a highway, but on a marine waterway, this is not so easily determined. As a general guideline for the normal speed and location of boat traffic, BCTS will use 15 knots at mid-channel for marine waterways. The 15-knot speed was arbitrarily chosen to represent a reasonable average speed. Regardless of this guideline, selection of the viewpoint(s) is left to BCTS, and it is expected that marine viewpoints will reflect logical choices (e.g. a known anchorage as opposed to a rarely used site). In evaluating the effectiveness of this strategy, it is not the selection of viewpoints that is of concern, but the achievement of the VQO.

The following are definitions for the individual VQO classes from the FRPA and the guidelines from the Visual Impact Assessment Guidebook (2nd Edition, January 2001) for the allowable percent alteration in perspective view for each VQO. The goal is to meet the definition of the VQO, whereas the percent alteration guideline is only provided to help determine the relative scale of alteration on a visual landscape from clear cut or seed tree silviculture systems. It is important to remember that these percentages are just guidelines and have no legal standing. Partial cutting systems have no alteration guideline as the impact will vary with the uniformity of harvesting and the percent of basal area removal rather than the size of the activity area. Refer to the Visual Impact Assessment Guidebook for specific details.

VQO	***VQO definition*** *(FPPR section 1.1)*	***% alteration guideline*** *(Visual Impact Assessment Guidebook)*
Preservation	Consisting of an altered forest landscape in which the alteration, when assessed from a significant public viewpoint, is (i) very small in scale, and (ii) not easily distinguishable from the pre-harvest landscape.	0
Retention	Consisting of an altered forest landscape in which the alteration, when assessed from a significant public viewpoint, is (i) difficult to see, (ii) small in scale, and (iii) natural in appearance.	0 - 1.5
Partial Retention	Consisting of an altered forest landscape in which the alteration, when assessed from a significant viewpoint, is (i) easy to see, (ii) small to medium in scale, and (iii) natural and not rectilinear or geometric in shape.	1.6 – 7.0

Modification	Consisting of an altered forest landscape in which the alteration, when assessed from a significant public viewpoint, (i) is very easy to see, and (ii) is (A) large in scale and natural in its appearance, or (B) small to medium in scale but with some angular characteristics.	7.1 – 18.0
Maximum Modification	Consisting of an altered forest landscape in which the alteration, when assessed from a significant public viewpoint, (i) is very easy to see, and (ii) is (A) very large in scale, (B) rectilinear and geometric in shape, or (C) both.	18.1 - 30.0

The Ministry of Forests has completed a landscape inventory for the Kalum and Nass TSAs. Visual quality objectives (VQOs) are objectives defining an acceptable level of alteration to a specific visual landscape unit based on the physical characteristics and public concerns.

The District Manager has "made known" established Scenic Areas with established Visual Quality Objectives throughout the Coast Mountains Forest District, including the Cascadia TSA, the Pacific TSA, TFL 1 and TFL 41. Prior to any development in a known scenic area, the planned development is reviewed to assess the potential impacts on the visual resource.

As of March 2022, VQOs are in place for these scenic areas within the area covered by this FSP:

- Highway 16 through the CMNRD District – Kalum South FDU
- Kitsumkalum Mountain – Kalum South FDU
- Highway 113 (Nisga'a Highway) - Kalum South FDU
- Highway 37 South, Terrace to Kitimat – Kalum South FDU
- Highway 37 North, Sideslip Lake to the Northern boundary of the CMNRD – Nass FDU
- Brown Bear Lake, View from the lake – Nass FDU

The following scenic areas do not have visual quality objectives, but have established visual sensitivity classes:

- Highway 113 (Nisga'a Highway), TFL 1 lands from Terrace to Cedar River – Kalum South FDU
- Douglas Channel, Sue Channel – North Coast FDU
- Barrie Reach – Kalum South FDU

For scenic areas without established VQOs, visual sensitivity class will be used as a surrogate, as follows:

Visual Sensitivity Class	***Managed to a Visual Quality Objective of:***
1	Retention
2	Partial Retention
3	Modification
4	Modification
5	Maximum Modification

The Swan Lake Wilderness Plan identified that views from Swan Lake are to be managed to a retention VQO with the maximum visible alteration being five percent. The Ministry of Forests has since established scenic areas for Highway 37, and it assumed that these scenic areas have captured the appropriate parts of the Swan Lake viewscape.

The FSP defines viewpoint criteria and includes a minimum viewing time that is based on the Visual Landscape Inventory: Procedures and Standards Manual (May 1997). If there is no area

that meets the criteria for a viewpoint, a VIA will still be done: the lack of a viewpoint will just be factored into the assessment of how consistent the block design is with the VQO.

The Kalum SRMP provides for a 100 m preservation corridor on each side of for the Upper Copper River. Should a VIA be carried out to meet the requirements of this result, then the viewpoint should be taken from the opposite bank of the Copper River at water level.

2.11 Forage

2.11.1 General Information

Forage in the context of this FSP is related to food required for livestock (i.e., for range activities). There are three range holders within the FSP area. There are no objectives for forage and subsequently, there are no strategies or results required. Nonetheless, some of the strategies or results within the FSP may have an impact on forage for wild species.

Forage for wild species occurs naturally; however, forage for grizzly bear is managed within this FSP through reduced stocking requirements and minimum inter-tree distance when activities occur on certain plant associations. Wildlife movement through low elevation passes is maintained, allowing species to forage over their normal range. Forage for moose is managed within this FSP through additional strategies to promote important moose forage species growth by limiting brushing of important species.

2.12 Productive Pine Mushroom Management within the Nass FDU

2.12.1 General Information

The management of pine mushrooms within the Nass FDU is focused at the stand level through the identification and mapping of productive pine mushroom sites during operational planning. A primary driver for this strategy is the lack of an operationally reliable landscape level productive pine mushroom spatial coverage for the entire FDU. In the event that a reliable landscape level productive pine mushroom coverage is made available, BCTS will consider amending Strategies 3.10.1.1 and 3.10.1.2 to transition the management focus from the stand to the landscape level.

3 ADVERTISEMENT, REFERRALS, REVIEW, AND COMMENTS

3.1 Public Advertisement and Referrals

3.1.1 Public Review and Comment

This Forest Stewardship Plan was made available to interested parties and to the general public for review and comment. The public was made aware that the FSP was available for review through advertisements that are placed in local newspapers: the Terrace Standard: April 11th and May 12th 2022; the Prince Rupert Northern View: April 14th and May 12th 2022 and the Kitimat Connector: April 14th and May 12th 2022. Hard copies of the FSP, Supporting Document and FSP maps were available for review at the Prince Rupert library, the Terrace library and the Ministry of Forests office in Terrace during the public review and comment period. In addition, a hyperlink to the FSP, Supporting Document and FSP maps on the BCTS website was provided in the published newspaper displays ads. Copies of these display ads have been attached to the Supporting Document

3.1.2 Stakeholder Referrals

Stakeholder referrals letters were mailed/emailed out in April 2022. Crown tenure holders, water licensees, trapline holders and guide outfitters whose tenures overlapped an FDU were contacted. Multiple letters, emails, phone calls and office drop-ins and BCTS responses resulted from these letters including responses from the Kalum Planning Implementation Committee, the City of Terrace, the Dodge Cove Improvement District and the Lower Skeena BC Fly Fishing Federation.

3.1.3 Public and Stakeholder Communication Log

Specific details regarding public review and comment and stakeholder referrals are provided to the CMNRD via the Provincial Consultation and Record Tracking System record for this FSP.

3.2 First Nations

BC Timber Sales has corresponded, and in some cases met, with the First Nations and Nisga'a Lisims Government (NLG) regarding this plan. Letters and emails were sent to FNs and NLG in April 2021, September 2021, March 2022 and May 2022.

3.2.1 First Nations and NLG Communication Log

Specific details regarding FN meetings, comments and concerns and responses are provided to the CMNRD via the Provincial Consultation and Record Tracking System record for this FSP.