CANADIAN FOREST PRODUCTS LTD.

Forest Management Group,
Houston Woodlands Operating Areas

Forest Vegetation Pest Management Plan

2012 – 2017

 # CFP HSTN 2012-2017

Prepared by

Canadian Forest Products Ltd.

April 20th, 2012
Revisions made: June 15, 2012

Table of Contents

SECTION 1: INTRODUCTION

1.1 CANFOR'S PEST MANAGEMENT PLAN FOR SILVICULTURE OBLIGATIONS

This Pest Management Plan (PMP) describes the integrated vegetation management process used by Canadian Forest Products Ltd. (Canfor) in relation to its silviculture obligations. The PMP is consistent with Canfor's Environmental Policy and Environmental Management System. Our Environmental commitments maybe viewed online by accessing the following URL:http://www.canfor.com/docs/news-2010/canfor-environment-policy_2011.pdf?sfvrsn=0 . The PMP is to be used by Canfor staff and contractors when assessing and conducting vegetation management treatments, while considering the obligations of the Forest Stewardship Plan and other applicable forest management plan commitments.

A silviculture regimen that involves the potential use of herbicides considers economic, environmental, and social concerns. Canfor's silviculture goal is to establish healthy, well-stocked stands of ecologically suited commercial tree species that recognize the sites' growth potential. Vegetation management is an integral part of meeting Canfor's legal requirements to produce Free Growing stands on its harvested obligations, and Canfor's vegetation management strategy includes using herbicides where appropriate and as permitted by this PMP.

1.2 GEOGRAPHIC BOUNDARIES OF THIS PEST MANAGEMENT PLAN

This PMP applies to the various licences that Canfor Houston Division has or manages within the Morice and Lakes Timber Supply Area's of the Northern Interior Forest Region and within the Bulkley Nechako Regional District. This area includes any of Canfor's managed openings that are contained within the areas identified on the Houston Division Integrated Vegetation Management Plan Area Map (Appendix 1).

1.3 RESPONSIBILITY FOR VEGETATION MANAGEMENT

Within Canadian Forest Products Ltd., Houston Division, the principal contact for information relating to this Pest Management Plan (PMP) is Walter Tymkow RFT,SP-LL Forestry Supervisor - Silviculture @ (250) 845-5103.

1.4 PEST MANAGEMENT PLAN LEGISLATION

A PMP is a plan that describes:

- A program for managing vegetation populations or reducing damage caused by vegetation, based on integrated vegetation management; and,
- The methods of handling, preparing, mixing, applying and otherwise using herbicides within the program.

The *Integrated Pest Management Act* (IPMA) and the Integrated Pest Management Regulation (IPMR) require pesticides to be used pursuant to the principles of Integrated Pest Management (IPM), which requires the development of a PMP and the use of pesticides in accordance with the terms and conditions of the PMP.

1.5 ROLE AND TERM OF THIS PMP

This PMP shall be in force for a five-year period from the date that the Pesticide Use Notice has been confirmed by the BC Ministry of Environment (MoE).

The PMP ensures the following:

- Legal accountability with the provisions of the IPMA, as well as all applicable federal, provincial and regional legislation;
- The incorporation and use of the principles of IPM; and,
- Public awareness of Canadian Forest Products Ltd., Houston Woodlands Division vegetation management program.

SECTION 2: INTEGRATED VEGETATION MANAGEMENT

2.1 INTRODUCTION

In the context of this document the term Integrated Vegetation Management (IVM) will be used to describe vegetation management using the principles of Integrated Pest Management. Vegetation refers to all plant life including, without limitation, grasses, sedges, forbs, vines, ferns, brush, deciduous trees, and coniferous trees.

2.2 OBJECTIVES OF CANFOR'S INTEGRATED VEGETATION MANAGEMENT PROGRAM

Canfor's integrated vegetation management objective is to prevent competing pest vegetation from causing injury or death, or having an unacceptable negative impact on:

- sites scheduled for planting or fillplanting,
- newly planted seedlings,
- juvenile, commercially valuable coniferous trees, and/or

While meeting the objectives of sustainable forest management by ensuring healthy and vigorous plantations, Canfor will use herbicides:

- appropriately as a vegetation management tool and seek a balance between social, economic, and environmental values; and,
- in a biologically and ecologically appropriate manner, with treatment strategies based on sound science.

2.3 INTEGRATED VEGETATION MANAGEMENT (IVM) PROCESS

The elements of Canfor's IPM program are:

1. Prevention
2. Pest Identification
3. Seedling and Vegetation Monitoring
4. Injury Thresholds and Treatment Decisions
5. Treatment Options and Selection Criteria
6. Post-Treatment Effectiveness Evaluation

Each of the above IPM elements form an integral part of Canfor's vegetation management program and are discussed in detail below.

2.3.1 Prevention

Canfor employs the following preventative measures to avoid competitive vegetation problems. The Post Harvest Assessment Survey is conducted within one season of harvest. This survey is used to confirm the ecology classification of the block, and to identify areas where vegetation is expected to become a concern. Results of the walkthrough will guide planting timing, species and stocktype selection, need for site preparation, and scheduling of future treatments and assessments.

- *Early Identification of Brush Prone Sites* – Biogeoclimatic Ecosystem Classification zones and site series known to have high brush hazards are

identified in the pre-harvest inspections, and appropriate treatment regimes are scheduled.

- *Selection of Appropriate Species* – The selection of species to be grown on a site must be ecologically suited to the site. Pre-harvest and post-harvest ecological classification will provide guidelines for species selection to maximize seedling performance and minimize the need for brushing treatments.
- *Selection of Appropriate Stock Type* – The physiological characteristics that seedlings possess have a significant impact on seedling establishment and capacity to compete against encroaching vegetation. Small stock types may be appropriate for use on sites with a low competition hazard or other limiting factors, while larger stock types may be appropriate on sites with high competition hazard.
- *Site Preparation* – Site preparation will be conducted, where appropriate, to improve microsites for newly established seedlings by reducing or rearranging slash, ameliorating adverse forest floor, soil, above and below ground vegetation structure, or other site biotic factors.

Other strategies that are used as a preventative measures include:

- *Use of Improved Seed* – Seed of the highest genetic worth available for the area is used to grow seedlings for planting and fillplanting activities. Seedlings grown from improved seed show faster growth than those grown from wild seed, providing these seedlings with an improved ability to compete with encroaching vegetation.
- *Minimizing Regeneration Delay* – Seedlings that are quickly established are more likely to compete successfully with problematic vegetation. Especially on brush-prone sites, seedlings should be planted as soon as possible following harvesting.
- *Maximizing Seedling Performance* – Seedlings that are planted in the best microsite possible and that remain undamaged during the planting process are more likely to compete successfully with problematic vegetation. Guidelines on stock handling to avoid seedling damage and optimizing the quality of planting microsites should be followed during planting activities.

2.3.2 Pest Identification

A pest, in the context of this PMP, is an organism that limits or eliminates the ability of a seedling crop tree from establishing and/or reaching free growing status. While this could include many kinds of organisms, the focus of this PMP is on plant species. Target species are outlined in the various senarios described in the "Injury Thresholds" Section 2.3.4.

A fundamental activity in managing competing vegetation is the timely identification of vegetation that has the potential for negatively impacting crop trees. The first step is sound ecosystem classification from which vegetation species can be predicted. This prediction helps plan the most appropriate reforestation strategies that may help to control competing vegetation.

The next step in prompt pest identification is a post harvest site assessment, which is carried out in order to prescribe silviculture treatments. The site is assessed for site limiting factors including frost, drought, aeration, saturation, heavy vegetation competition, soil temperature and stability. Pest identification will also occur in the monitoring program which is described in Section 2.3.3.

The chief references for the identification of vegetation pests commonly found within the PMP area include:

- *Plants of Northern British Columbia* (Mackinnon, Pojar, and Coupe)
- *Plants of Southern Interior British Columbia* (Parish, Coupe, and Lloyd)
- *Trees, Shrubs, Flowers* (Lyons)
- *Autecology of Common Plants in British Columbia: A Literature Review* (Haeussler, Coates, and Mather)

2.3.3 Seedling and Vegetation Monitoring

Canfor monitors and assesses seedling and vegetation performance using a combination of the following methods described in the table below. Treatment decisions will be based on current surveys (completed <18 months from treatment date). In each of the survey types referenced in the following table, information that is collected includes crop tree species, height, density, age and for competing vegetation species, height and distribution. This data is recorded and stored in our Corporate Database (Cengea).

Seedling and Vegetation Monitoring Methods	Frequency
Survey - Regeneration Performance – This more intensive type of survey is used on the more heterogeneous sites where it may be difficult to evaluate the performance of planted and natural stock and recommend brushing treatments. This survey is used to determine stocking levels and performance of planted and natural stock, and to prescribe brushing treatments or fill plants if necessary.	Once - 2 or 3 growing seasons after planting
Walkthrough - Regeneration Performance – Informal walkthroughs on more homogenous sites where seedling performance and competition hazard are easier to evaluate. This survey is used to determine stocking levels and performance of planted and natural stock, and to prescribe brushing treatments or fill plants if necessary.	May be scheduled when more information is required for a treatment decision.
Walkthrough - Free Growing Recce - Walkthrough survey used to confirm that block, or specific strata, will meet standards for Free Growing before a Free Growing Survey is undertaken.	Once – 5-10 growing seasons after planting. Scheduled as needed as survey regime progresses.
Site Visit - A site visit used to assess crop tree height, density and distribution, as well as brush competition and distribution. Also used on Predictive Herbaceous Senario to confirm treatment.	May be scheduled when more information is required for a treatment decision.
Survey - Free Growing - The purpose of the Free Growing Survey is to gather data required to provide confidence and reliance that a free growing stand has been established. Data will be collected to produce a Free Growing report.	Once - 5 to 15 growing seasons after planting.

2.3.4 Injury Thresholds and Treatment Methods and Decisions

Decision Thresholds and Action Levels

With respect to a development and implementation of a *decision protocol* for determining whether or not treatment is required, there are three scenarios to address. These scenarios can be applied to portions of or entire openings where treatment is recommended based on the results of injury thresholds:

Senario 1: Obvious Herbaceous/Shrub – In this scenario, herbaceous vegetation levels are well developed, and crop trees have been established long enough (1-2 growing seasons) that response can be assessed with respect to seedling attributes.

Target Species - Vegetative species in this scenario include Red elderberry, Rubus species (e.g. thimbleberry), Ribes species, Black twinberry, Sorbus species, rododendron, High-bush cranberry, fireweed and grasses.

Treatment objectives are to control competing vegetation long enough that crop trees are able to recover from injury, and that crop trees can generate adequate growth to keep ahead of recovering brush levels. The table below describes the measure of vegetation competition and seedling impact justifying treatment.

Indicators of Injury	How the Thresholds were Chosen	Measure	Threshold Beyond Which Treatment will be Applied
Vegetation Index: Comeau's Index**	A commonly used vegetation index is Comeau's Index, which is a measure of total density of vegetation multiplied by vegetation height divided by crop tree height.	sum (% cover of brush species x height) *divided by* (tree height)	> 80 (recommend treatment)

**Comeau's Index (CI) is a simple index that measures the competition for sunlight with regards to crop trees. CI is calculated as the sum of the products of cover and height for all non-crop species within a 1.26 meter radius around a crop tree, divided by crop-seedling height. CI shows that growth declines with increases in competition index. There is a very rapid decline in growth as CI increases from 0 to 100. At CI=100, growth is approximately 60% of that of a seedling growing free from competition. At a CI=150, seedlings receive 30% of the full sunlight in midsummer and would achieve approximately 45% of potential growth rates (Comeau, 1993).

Scenario 2: Predictive Herbaceous – In this scenario, at the time of assessment, the vegetation levels may or may not be fully expressed. Additionally, crop trees may not be established or have not been established long enough that response can be assessed with respect to seedling attributes. Predictive herbaceous is ecology driven and the **target vegetation** includes the species that are described in Scenario 1.

Treatment objectives focus on maintaining current seedling vigor prior to injury; specifically on sites where (if left untreated) we forecast that vegetation competition will cause injury to crop trees. This is a predictive scenario, whereby treatment decisions are based on brush hazard ratings that are assigned by site ecology. Site classification is based on Biogeoclimatic ecosystem classification system and is completed during the development of the Silvicluture Prescription/Site Plan. See the following links to Land Management Hand books.
http://www.for.gov.bc.ca/hfd/pubs/docs/lmh/lmh26.htm
http://www.for.gov.bc.ca/hfd/pubs/docs/lmh/Lmh54.pdf

As an example: A Field Guide for Site Identification and Interpretation for the Southwest Portion of the Prince George Forest Region - Land Management Handbook #54 cites vegetation potential as "High - Very High" for the SBSwk3 07.

Brush hazard ratings associated with biogeoclimatic ecosystem classification (BEC) applicable to the Houston Division are as follows:

Biogeoclimatic Zone, Subzone and Variant	Site Series									
	01	02	03	04	05	06	07	08	09	10
ESSF mv3	high	low	low-mod	very high	very high	very high	very high			
ESSF mc	low	low	low	low	high	high	very high	mod	mod	high
ESSF mk	low	low	low	high	very high	high	high			
SBS dk	mod	low	low	low	low	high	very high	very high	mod	mod
SBS mc2	low - mod	low	low		very high	high	mod		very high	very high
SBS wk3	high	low	low	mod	high	very high	very high	very high	nil	

Ecology classed as moderate, high, or very high may need treatment based on the predictive herbaceous scenario. Where treatments are prescribed, a follow up S*ite Visit* will be conducted to confirm treatment (conducted the same season, prior to treatment). These proactive treatments may minimize the potential for repetitive silvicultural treatments. The thresholds are described in the following table:

Indicators	Cause	Measure	Threshold
1. Brush Hazard by BEC Association	Based on local knowledge of treatment responses, observed data from surveys, and Biogeoclimatic Ecosystem Classification (BEC), we are able to predict which site types have likelihood of requiring brushing treatments. This is combined with the indicators below to prescribe treatment.	See Table above	Moderate, High to Very High brush hazard rating
2. Vegetation Index (Comeau's)	See Comeau's Index description under Scenario 1. For a site preparation decision where no tree data exists, use 20 cm (target height for Sx 412 2+0).	sum (% cover of brush x height) / (tree height)	> 80 (recommend treatment)

Senario 3: Obvious Deciduous Vegetation Competition – Expressed deciduous competition results in imminent or measurable negative crop tree impact.

Target Species - For the purpose of this scenario, "deciduous vegetation" refers to Trembling aspen, Cottonwood, Alder species, Willow species, Maple and Birch.

Treatment objectives for this scenario is to release crop trees from competition of deciduous species. Decision thresholds are based on densities and distributions of deciduous trees that reduce stocking and impacts the ability to meet *legal silviculture obligations* as specified in the approved Forest Stewardship Plan (see Appendix 2 – Canfor Houston FSP Stocking Standards) or Silviculture Prescription. The following threshold provides guidance:

> Without treatment, Free Growing obligations (i.e. minimum number of free growing stems per hectare)will not be met because the distribution of deciduous species results in a stand > 1.0 contiguous hectare where deciduous species are encroaching on the *effective growing space* of the crop tree. Without treatment, Free Growing obligations will not be met. See Forest and Range Practise Regulations Section 46.11. http://www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/12_14_2004#section46.11

This PMP uses current practices as per the obligations and definitions pertaining to a "Free Growing Tree" as described in the FS 660, Section 18.a. (http://www.for.gov.bc.ca/hfp/silviculture/Surveys/FS660final2011.pdf)

2.3.4.1 Treatment Options and Selection Criteria

2.3.4.1.1 Ground-Based Herbicide Methods

Herbicide - Backpack Methods	
Backpack Discretionary - Non-continuous, discretionary application of herbicide across portions of areas within a cutblock. Equipment includes low-pressure backpack sprayer with adjustable nozzles. Varying glyphosate application rates possible.	
Backpack Broadcast - Continuous application of herbicide across all or a portion of areas within a cut block. Equipment includes low-pressure backpack sprayer with adjustable nozzles. Varying glyphosate application rates possible.	
Benefits	**Limitations**
➢ Effective control over a number of years. ➢ Can treat on blocks with lots of mature standing leave trees. ➢ Can be applied with more precision, and applicator can be more "selective" than a helicopter. ➢ Little or no buffer zone required protecting PFZ.	➢ Stringent application constraints ➢ Intensive preparation and follow up ➢ Effectiveness diminishes as height of brush increases. ➢ Needs a very high level of supervision and layout. ➢ Higher potential of worker exposure to herbicide. ➢ Safety concerns with wearing heavy equipment on rough terrain.
Rationale for Selecting Treatment Method in PMP –This method is a key tool, and is especially useful in areas that have lots of leave trees and herbaceous brush.	

Herbicide - Brushsaw Methods	
Cut Stump - Non-continuous, discretionary application of herbicide onto cut surfaces of target vegetation only. Equipment generally includes a brushsaw with a user-controlled herbicide attachment that applies herbicide beneath the surface of the cutting blade. Varying glyphosate application rates possible but are much lower rates than Aerial and Backpack methods.	
Benefits	**Limitations**
➢ Effective control over a number of years preventing re-sprouting of target vegetation. ➢ Much bigger treatment window versus other herbicide treatment methods. ➢ Little or no buffer zone required protecting PFZ. ➢ Very little herbicide exposure to workers. ➢ Uses less herbicide on a given area (reduced application rate)	➢ Stringent application constraints ➢ Intensive preparation and follow up ➢ Needs a very high level of supervision and layout. ➢ Safety concerns with wearing heavy equipment on rough terrain. ➢ Expensive equipment required.
Rationale for Selecting Treatment Method in PMP –This method is a good tool for blocks that have high numbers of leave trees or numerous water bodies with primarily broadleaf competition, and shows good effectiveness in preventing re-sprouting of aspen.	

2.3.4.1.2 Ground-Based Non-Herbicide Methods – Small Engine

Non-Herbicide – Brushsaw Method	
Manual Brushing – Worker cuts target vegetation with a brushsaw or chainsaw.	
Benefits	**Limitations**
➢ No herbicide use. ➢ Public acceptance ➢ Can be applied selectively ➢ Can be used in riparian areas or pesticide free zones	➢ Re-sprouting of target species, may require re-treatment ➢ Safety hazards associated with saws, exhaust fumes, and repetitive motion injuries. ➢ High treatment cost. Expensive equipment required. ➢ Relative short window for treatment (after leaf out to end of July). ➢ Not effective on herbaceous brush.
Rationale for Selecting Treatment Method in PMP - Can be effective if crop trees are taller and not suppressed (but will not make "Free Growing")	

2.3.4.1.3 Ground-Based Non-Herbicide Methods – Hand Tools

Non-Herbicide – Girdle	
Manual Girdling – Worker uses hand-girdling tool and removes a continuous strip of bark around individual stems, eventually (2-3 years) killing the trees.	
Benefits	**Limitations**
➢ No herbicide use. ➢ Public acceptance. ➢ Can be applied selectively. ➢ Low cost hand tools so workforce can gear up easily.	➢ Re-sprouting, may require multiple treatments. ➢ High treatment cost due to low productivity. ➢ Cannot use for herbaceous. ➢ Repetitive strain injuries common.

Rationale for Selecting Treatment Method in PMP - Can be effective if crop trees are taller and not suppressed (but will not make "Free Growing")

2.3.4.1.4 Ground-Based Non-Herbicide Methods – Livestock

Non-Herbicide – Sheep	
Sheep Grazing – 1-3 shepherds guide a herd of sheep (1,000 – 1,500 head) through areas where they eat target vegetation.	
Benefits	**Limitations**
➢ No herbicide use. ➢ Not constrained by weather conditions.	➢ Moderate to high amounts of damage to crop trees (especially Pli and Fdi and any species in June) ➢ High treatment cost. ➢ Can only use for certain herbaceous species and only provides a couple months of control. ➢ Can only use on good access, flat blocks with low to no slash. ➢ Need a group of blocks in close proximity to make a "program". ➢ Risk of disease spread to wild ungulate populations. ➢ Potential damage to pesticide free zones and riparian areas from herd. ➢ Risk of predation.
Rationale for Selecting Treatment Method in PMP - Only other realistic option to herbaceous treatment if herbicide cannot be used.	

2.3.4.1.5 Mechanical Site Preparation

Non-Herbicide – Mechanical Site Preparation	
Mechanical Site Prep – Creating improved microsites for reforestation where site limiting factors might inhibit seedling performance, for example soil temperature, soil moisture, competing vegetation, or physical barrier (slash loading)	
Benefits	**Limitations**
➢ No herbicide use. ➢ Public acceptance. ➢ Increased soil temperature	➢ Temporary brush control ➢ Expensive ➢ Access limitations ➢ Possible soil compaction and rutting ➢ Potential for surface erosion ➢ High visual impact ➢ Site constraints – slope, slash, duff layer depth
Rationale for Selecting Treatment Method in PMP – Creates favourable microsites and achieves temporary brush control	

2.3.5 Selection of Treatment Method

Treatment method selection takes into consideration a number of factors including physical (see Benefits and Limitations in Treatment Methods tables), legal and political constraints as well as stakeholder concerns. Treatment efficacy and treatment cost are also considerations in selecting an appropriate method of treatment.

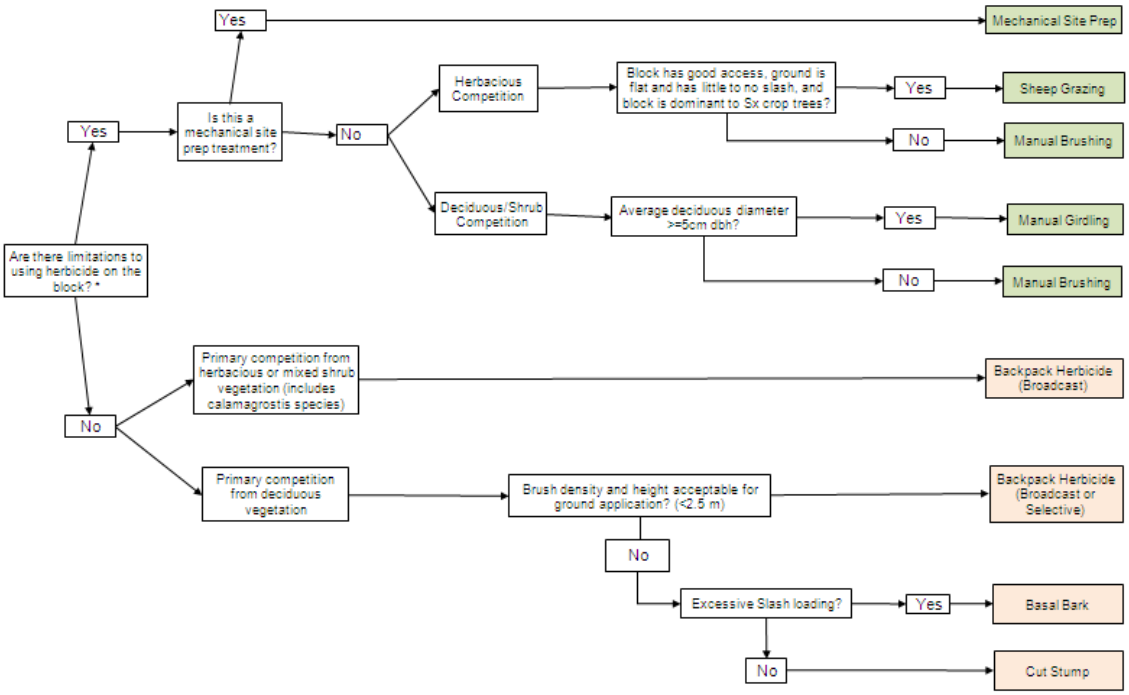
Legal and political constraints will influence treatment selection. Legal constraints must be addressed and accommodated within all strategies. Political constraints may come from a number of sources. These constraints may be identified through a number of avenues, for example public consultation, regulatory agencies, Forest Stewardship Plan processes, and Land and Resource Management Plan processes.

Due to the complexity of issues that may influence a treatment decision, this PMP does not attempt to create a treatment decision matrix that may exclude or that may apply extraneous constraints upon a treatment decision.

The flowchart below describes the process guideline for selecting a brushing method in Canfor Houston. This process is greatly simplified and the actual treatment choice may be different than below with a stated rationale.

Brushing Method Selection Guide

NOTE: This decision flowchart is a guide to help determine brushing treatments; factors such as block location, size of treatment area, terrain issues (i.e. slope, slash levels), and cost will be considered when reaching a final brushing treatment decision.



* Limitations to using herbicide on the block may include: specific SP requirements, wildlife habitats (i.e. nests, dens identified on block), ungulate winter ranges, stakeholder limitations, pesticide free zones, old growth management areas, and other limitations specified in higher level plans.

2.3.6 Post-Treatment Evaluation

For all treatment areas a "Post Treatment Audit" will be conducted within 12 months of treatment. All blocks where treatment has been conducted will be visually assessed for the following :

Efficacy
Coverage of intended treatment area
• absence of striping
• absence of missed areas
Chemical Efficacy
• level of removal of target vegetation
• current level of competition
Seedling Damage
• level of seedling damage due to chemical
• location of damage, if any (terminal bud, needles)
Prescription Evaluation
• treatment meets needs of plantation and schedule follow up monitoring survey. (See Section 2.3.3)
Compliance
Pesticide Free Zones
• no evidence of herbicide compromise into Pesticide Free Zones
Boundaries
• as mapped on final bag maps
• consistent with treatment plan
• no evidence of herbicide outside of marked boundaries

*Non-compliance identified during the Post Treatment Audit will be reported to the Ministry of Environment.

Subsequent surveys as described in Section 2.3.3 may be conducted to further evaluate seedling performance and vegetative response to treatment.

SECTION 3: OPERATIONAL INFORMATION

3.1 PROCEDURES FOR SAFELY TRANSPORTING HERBICIDES

The federal *Transportation of Dangerous Goods Act* (TDGA) and the *Integrated Pest Management Act* regulate the transportation and handling of poisonous substances, which may include some herbicides.

The following procedures will be followed while transporting herbicides for application under this PMP:

- Limited amounts of herbicide concentrate will be carried in any one vehicle. The quantity will be no more than what is necessary for each project.
- Herbicide concentrate will only be carried in a secure lockable, signed compartment.
- Herbicide concentrate will only be transported in original labeled containers.
- Herbicide concentrate will always be carried separately from food and drinking water, safety gear, and people.
- Spill containment and clean up equipment will be carried separately from herbicides but in close proximity to the herbicide on each vehicle during herbicide transport and use.
- Appropriate documents such as operations records and material safety data sheets (MSDS) will be carried in each vehicle during herbicide transport and use.

3.2 PROCEDURES FOR SAFELY STORING HERBICIDES

Herbicides will be stored in accordance with the *Integrated Pest Management Act* and Regulations and the WorksafeBC document "Standard Practices for Pesticide Applicators". In summary, the storage area must:

- be ventilated to the outside atmosphere;
- be locked when left unattended;
- restrict access to authorized persons;
- be placarded on the outside of each door leading into the facility in which the herbicides are stored bearing, in block letters that are clearly visible, the words "WARNING – CHEMICAL STORAGE – AUTHORIZED PERSONS ONLY".

In addition, the person responsible for the storage area shall notify the appropriate fire department of the presence of herbicides on the premises.

Some contractors may store herbicides for extended periods of time in vehicles when performing herbicide treatments for Canfor. The vehicle is considered a mobile storage unit. Persons responsible for the herbicide storage shall ensure that all herbicides are stored in a locked canopy, or similar arrangement, separate from the driver and personal protective equipment.

3.3 PROCEDURES FOR SAFELY MIXING, LOADING, AND APPLYING HERBICIDES

All mixing, loading and application of herbicides shall be carried out by certified pesticide applicators in the appropriate category of certification. General procedures and precautions include:

- Mixing of herbicides must always be conducted in a safe manner.
- Safety spill kits, spill response plans and first aid supplies shall be present on or near the treatment site.
- Eye wash station(s) and protective clothing as recommended on the respective product labels shall be available on or near the treatment site.
- Product labels and Material Safety Data Sheets will be available on or near the treatment site to ensure that quantities of herbicides being mixed and used are consistent with label rates.
- There shall be no mixing or loading of herbicides within 15 metres of sensitive environmental features (i.e. riparian management areas as described in the *Forest and Range Practices Act* and non classified waterbodies).
- Ensure that the application equipment is in good working order and, if required, is calibrated to conform to the application rates on the pesticide label.
- Implement precautions to prevent unprotected human exposure to pesticides.
- Implement precautions to ensure that domestic water sources, agricultural water sources and soil used for agricultural crop production are protected for their intended use.
- Ensure that, to prevent treatment of watercourses, the suction hoses used for herbicide(s) will not be used to pick up water from natural sources such as streams or ponds. The intake of water for mixing will be protected from backflow into the natural source by an "air gap" or "reservoir" between the source and the mixing tank.

3.4 PROCEDURES FOR THE SAFE DISPOSAL OF EMPTY HERBICIDE CONTAINERS AND UNUSED HERBICIDES

Empty containers shall be disposed of in accordance with the manufacturer's instructions as noted on the product label or provincial instructions and recommendations that are detailed in the BC Ministry of Environment document Handbook for Pesticide Applicators and Dispensers (1995). As a minimum, empty herbicide containers shall be:

- returned to the herbicide distributor as part of their recycling program; or,
- triple rinsed or pressure rinsed, then altered so they cannot be reused; and,
- disposed of in a permitted sanitary landfill or other approval disposal site.

Unused herbicides will be stored at the herbicide distributor's warehouse or another approved facility.

3.5 PROCEDURES FOR RESPONDING TO HERBICIDE SPILLS

Spill treatment equipment shall be at or near storage (including mobile storage) mixing and loading sites, and it shall include the at least following:

- Personal protective equipment
- Absorbent material such as sawdust, sand, activated charcoal, vermiculite, dry coarse clay, kitty litter or commercial absorbent
- Neutralizing material such as lime, chlorine bleach or washing soda
- Long handled broom, shovel, and waste-receiving container with lid

A copy of an approved spill response plan shall be at or near each work site. All personnel working on a project involving herbicides should be familiar with its contents. If contractors that work under this PMP have their own spill response plan, it must meet or exceed the requirements as described in Canfor's Emergency Preparedness and Response Plan, generally described below:

- All personnel shall be protected from herbicide exposure by wearing appropriate protective clothing and safety gear;
- Any person exposed to a herbicide shall be moved away from the place of the spill;
- First aid should be administered, if required;
- The source of the spill should be stopped;
- The spilled material should be stopped from spreading by creating a dam or ridge;
- The project supervisor shall ensure operations cease until the spill is contained and the source is repaired;
- Absorbent material shall be spread over the spill, if applicable, to absorb any liquid;
- The absorbent material shall be collected in garbage bags or containers with the contents clearly marked;
- Contaminated soil or other material will be removed from the spill site and placed in garbage bags or containers;
- The person responsible for the project shall contact an approved representative of Canfor for shipping instructions and disposal requirements;
- When more than five kilograms of product of herbicide is spilled on land, or any amount into a waterbody, the person responsible for the project will immediately report it to the Provincial Emergency Program by telephoning 1-800-663-3456 or, where that is impractical, to the local police or nearest detachment of the RCMP and an approved representative of Canfor will be notified of the details related to the spill as soon as is practical by the Contractor project supervisor

SECTION 4 ENVIRONMENTAL PROTECTION STRATEGIES AND PROCEDURES

All vegetation management activities intended for use within this PMP will incorporate measures designed to protect the following:

- Strategies to protect community watersheds, and other domestic water sources
- Strategies to protect fish and wildlife, riparian areas, and wildlife habitat
- Strategies to prevent herbicide treatment of food intended for human consumption
- Pre-treatment inspection procedures for identifying treatment area boundaries
- Procedures for maintaining and calibrating herbicide application equipment
- Procedures for monitoring weather conditions and strategies for modifying herbicide application methods for different weather conditions and

In this PMP, Canfor based the size of its pesticide-free zones (PFZ) and no treatment zones (NTZ) on the standards currently contained in the *Integrated Pest Management Act* and Regulations.

4.1 STRATEGIES TO PROTECT COMMUNITY WATERSHEDS AND OTHER DOMESTIC WATER SOURCES

There are no community watersheds that exist in Canfor Houston's operating areas.

A Pesticide Free Zone (PFZ) will be established around any other established community watersheds that may be developed during the term of this PMP to ensure that the integrity of the watershed is maintained. The area of the PFZ will comply with the standards set at that time.

Due to the location of Canfor's tenure (Crown land located away from private land), there are no known water supply intakes or wells used for domestic or agricultural purposes on Canfor's tenure where there are agreed upon measures that are in excess of requirements outlined in Regulation.

Pursuant to section 71 of the Integrated Pest Management Regulation, a 30 m no-treatment zone will be implemented around any water supply intake or wells used for domestic or agricultural purposes, including water for livestock or for irrigation of crops.

4.2 STRATEGIES TO PROTECT FISH AND WILDLIFE, RIPARIAN AREAS, AND WILDLIFE HABITAT

4.2.1 Pesticide Free Zones (PFZ)

"Pesticide Free Zone" means an area of land that must not be treated with pesticide and must be protected from pesticide moving into it.

Water bodies are identified, pre-harvest, in conjunction with the development of Silviculture Prescriptions, Site/Exemption Plans, or Site Level Plans. Herbicide layout contractors conduct a reconnaissance of the treatment area to identify water bodies post-harvest.

"Pesticide Free Zones" will be established consistent with the Integrated Pest Management Regulation. See IPMR Section 74 and 75.
http://www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/10_604_2004#section74

In order to maintain "Pesticide Free Zones" a 10 meter buffer will be established for back pack herbicide application methods.

4.2.2 Wildlife Habitat Features and Riparian Area

Wildlife Habitat features, Wildlife Habitat Areas and Riparian areas are defined in Regulation and identified pre-harvest and managed through approved Silviculture Prescriptions, Site Plans and Forest Stewardship Plans. The application of herbicides will be consistent with the protection measures stated in those operational plans and/or Regulation. Observation of wildlife habitat features post-harvest will be reported to Canfor representatives, and where necessary, site-specific protection measures will be implemented through the establishment of Pesticide Free Zones.

Wildlife Habitat Features found in the Canfor Houston Woodlands operating area include:

- Wildlife Habitat Areas (WHA) - 4 areas designated for the purpose of Bull Trout Habitat. These are identified in the Government Action Regulation (GAR) Order as WHA Areas #6-283,6-284, 6-285 and 6-286. Use the following link to access information on their locations. http://www.env.gov.bc.ca/cgi-bin/apps/faw/wharesult.cgi?search=wlap_region&wlap=Skeena

  The protection measures related to the WHA Order Schedule 1 - General Wildlife Protection Measures specifies:
  Implement primary forest activities to maintain stream channel integrity, large woody debris inputs, water quality, groundwater flow, substrate composition; and prevent cumulative hydrologic effects.

4.2.3 Species at Risk

Canfor is certified under several forestry certification brands, and the application of herbicides under this PMP will be consistent with the protection measures strategies stated in our Sustainable Forest Management Plan, specifically outlined in Canfor Houston Division - "Fine Filter Species Operational Control". See Appendix 3

Canfor has developed annual training for staff and contractors for assistance in proper identification of at risk species and plant communities found within Canfor's operating areas. Observation of species at risk post-harvest will be reported to Canfor representatives, and where necessary, the observations will be reported to the Ministry of Environment and site-specific protection measures may be implemented. See Appendix 4 – Species At Risk and Sites of Biological Significance Training.

Where species at risk are encountered they will be excluded from treatment area or they will be protected by a "Pesticide Free Zone".

4.3 STRATEGIES TO PREVENT HERBICIDE TREATMENT OF FOOD INTENDED FOR HUMAN CONSUMPTION

Canfor shall attempt to locate areas where there is food grown for human consumption and take the appropriate precautions during vegetation management operations to avoid treatment of these areas. Such precautions may include providing increased buffer zones around these areas during herbicide applications, timing applications, or using non-chemical methods of vegetation management. Signs will be posted at all entrances to the treatment site to meet regulatory requirements (as per Sec 64(1) of the Integrated Pest Management Regulations).

Herbicide will not be stored or transported in the same compartments as human food.

4.4 PRE-TREATMENT INSPECTION PROCEDURES FOR IDENTIFYING TREATMENT AREA BOUNDARIES

A pre-treatment inspection will be completed on all treatment sites by the contractor and/or Canfor supervisor to identify treatment area boundaries and the presence of the general public, grazing wildlife and livestock. During this inspection, sensitive areas such as bodies of water and no treatment zones are noted on maps. The contractor is instructed to follow the bagging/flagging requirements as depicted on the treatment layout map.

During the pre-work discussion, contractor representatives shall be instructed in the bagging/flagging requirements and precautions, and review the methodology and procedures for applications and handling of the herbicide.

No treatment is to proceed until it is confirmed there is no presence of the general public and there is no visible grazing wildlife or livestock in the treatment area.

4.5 WEATHER MONITORING AND STRATEGIES

Measurements will be made to record weather conditions prior to treatment, at the end of treatment and in between treatment if there has been a change in site or weather conditions. The following items will be recorded for foliar treatment methods:

- Wind speed and direction
- Relative Humidity (RH)
- Presence of frost or dew
- Precipitation
- Temperature
- Sky conditions (clear, overcast, cloudy, partly cloudy)

The following table describes strategies for modifying application according to changing weather conditions:

	Temp.	Thick Dew or Frost on Leaves	Wind Speed (km/hour)	Relative Humidity (%)	Rain, Inversion, Fog	Freezing Conditions
Backpack	**>26.5 C No Spray**	**No Spray**	**>8 No Spray**	**<40 No Spray**	**No Spray**	**No Spray**
Cutstump, Hack and Squirt					**No application if raining**	**No Application**
Basal Bark					**No application if stem is wet**	**As long as snow is below treatment height**

4.6 PROCEDURES FOR MAINTAINING AND CALIBRATING HERBICIDE APPLICATION EQUIPMENT

The application contractor shall ensure that the application equipment is in good working order and, if required, is calibrated to conform to the application rates on the pesticide label. Proper calibration is very important to ensure herbicide is not under or over applied.

4.6.1 Ground Herbicide Equipment

The application contractor shall calibrate equipment used for backpack applications. Equipment should be calibrated:

- for each individual applicator using hand-held or backpack equipment,
- at the beginning of each season
- at the start of each treatment job
- any time the application equipment is changed
- for each change in size or type of nozzle
- any time the herbicide or formulation of a herbicide is changed

A maintenance person, designated by the application contractor, must conduct maintenance and repairs. The maintenance person must be knowledgeable in the operation and repair of the equipment. The equipment operation must conform to the manufacturer's specifications.

Records will be kept by contractors for each piece of calibrated equipment for a minimum of 2 years.

SECTION 5: FORESTRY HERBICIDES PROPOSED FOR USE UNDER THIS PMP

Herbicides proposed for use within the scope of this PMP are registered for forestry use under the Pesticide Control Products Act. They have been deemed safe when applied according to the instructions outlined on their labels.

The herbicides listed below are proposed for use within the context of this PMP for vegetation control.

Herbicide Trade Name	Active Ingredient	Application		Pesticide Control Products Act #
		Usage	Ground	
Vision, Vision Max Vantage Forestry, Weed-Master	glyphosate	common	yes	19899, 27736, 26884, 29009

The most common herbicide used in forestry is glyphosate. It is selected for its low toxicity and high efficacy in treating competing forest vegetation. When applied at relatively low rates, it effectively manages competing forest vegetation species without significant damage to coniferous trees.

Appendix 1: Houston Division Pest Management Plan Area Map

Integrated Vegetation Management Plan Areas
Canadian Forest Products Ltd
Houston Operations
CFP HSTN 2012-2017

Mackenzie Forest District

Fort St. James Forest District

Hazelton

Sikeida Stikine Forest District

Garnaby

Kitwanga

Smithers

Telkwa

Granisle

Barrett Lake

Houston

Kalum Forest District

Decker Lake

Nadina Forest District

Burns Lake

Fraser Lake

Kalum Forest District

North Island - Central Coast Forest District

North Island - Central Coast Forest District

1:800,000

LEGEND

- Mapsheet
- Forest_District_Boundary
- Timber_Supply_Area_Boundary
- Town

ROAD CLASS

- highway
- local
- resource
- Lakes
- Rivers
- Registered Water Licence/Wells
- BC_Park
- First Nation Reserve

Forest_Development_Units

IPMP Areas under Plan

- Houston ComFor Licence
- Lakes Licence
- Morice Licence

Appendix 2: Canfor Houston Forest Stewardship Plan Stocking Standards Excerpt of Section 8

8 STOCKING REQUIREMENTS

8.1 General Standards

For the purposes of section 16(1) of the Forest Planning and Practices Regulation, section 44(1) of that regulation will apply to every area where the **applicable agreement holder** of this **FSP** is required to establish a free growing stand.

For the purposes of section 16(3) of the Forest Planning and Practices Regulation, for each area where a holder of this **FSP** is required to establish a free growing stand

(a) The applicable stocking standards and applicable regeneration date referred to in section 44(1)(a) of the Forest Planning and Practices Regulation, and
(b) The applicable stocking standards and applicable free growing height referred to in section 44(1)(b) of the Forest Planning and Practices Regulation

Are subject to the Variations from General Standards in paragraph 8.2, as set out in Appendix A opposite the Biogeoclimatic Site Series that applies to the Standard Unit.

The holders of this **FSP** do not propose to carry out, on an area; timber harvesting that is restricted to

(a) Commercial thinning, removal of individual trees or a similar type of intermediate cutting, or
(b) Harvesting of special forest products

And, as such, section 44(4) of the Forest Planning and Practices Regulation has no application to this plan.

8.2 Variations from General Standards

Despite Paragraph 8.1, an **applicable agreement holder** of this **FSP** will apply the following stocking standards in the following circumstances:

(a) The Regeneration Date applicable to a Standard Unit will be
    (i) Four years;
    (ii) Seven years if natural regeneration is used in the whole of the Standard Unit.

(b) That aspen, cottonwood, and birch as well as willow and alder within, 10 meters of a classified riparian feature are not considered deleterious brush competition when conducting a free growing survey.

(c) In a Standard Unit consisting of a site series complex;
    (i) The Target Stocking Standards, Minimum Preferred and Acceptable, Minimum Preferred, Minimum Inter-tree distance and Minimum Height will be those of the dominant site series, and
    (ii) The preferred species for the Standard Unit will include all of the preferred species for all the site series comprising that unit, however potential crop trees will only be preferred or acceptable where they are ecologically suited within the Standard Unit.

(d) The maximum countable coniferous stems per hectare in all site series is:
    (i) 10,000 stems per hectare for stands comprised of less than 80 percent Lodgepole Pine based on the inventory, or
    (ii) 20,000 stems per hectare for stands comprised of greater than or equal to 80 percent Lodgepole Pine based on the inventory.

APPENDIX A: REGENERATION AND FREE GROWING STOCKING STANDARDS

Single Storied Stocking Standards[8, 9, 10]

	BGC Classification			Regeneration Guide					*Free Growing Guide*		
				Species		Stocking				Min. Height	
Stocking Standard ID	Zone, Subzone and Variant	Site Series	Association	Preferred (p)	Acceptable (a)	Target	Minimum preferred and acceptable	Minimum preferred	Minimum inter-tree distance MITD (metres)	Species	Ht (metres)[3]
						Well-Spaced Stems/Ha					
	ESSFmc	02, 03	Bl/Pl - Juniper - Cladonia Bl-Huckleberry-crowberry								
	ESSFmv3	02	Bl/Pl - Crowberry - Cladina	Pl[11]	Sx Bl[4]	1000	500	400	2.0	Pl/Other	1.2/ 0.6
	ESSFmc	01, 05, 06	Bl-Huckleberry Leafy Liverwort Bl-Huckleberry-Thimbleberry Bl - Oak fern - Heron's bill								
	ESSFmv3	01, 04, 06	Bl - Rhododendron - Feathermoss Bl - Oak fern - Knight's plume Sxw - Huckleberry - Highbush Cranberry	Bl Sx	Pl	1200	700	600	2.0	Pl/Other	1.6/ 0.8
	ESSFmc	04	Bl - Huckleberry - Heron's Bill	Pl Sx Bl		1200	700	700	2.0	Pl/Other	1.6/ 0.8
	SBSmc2	01,05,06	Sxw - Huckleberry Sxw - Twinberry - Coltsfoot Sxw - Oakfern	Pl Sx	Bl[4]	1200	700	600	2.0	Pl/Other	1.6/ 0.8
	ESSFmc	07	Bl - Devils Club-Lady fern	Bl Sx	Pl	1200	700	600	1.6	Pl/Other	1.6/ 0.8

Single Storied Stocking Standards[8, 9, 10]

	ESSFmv3	05	Bl - Devils Club - Rhododendron								
	ESSFmc	08,09,10	Bl - Valerian - Sickle moss Bl- Horsetail-Glow moss Bl - Horsetail- Leafy moss	Bl Sx		1000	500	500	1.6	All	0.60
	ESSFmk	01, 04	Bl/Hm - Twistedstalk Bl/Hm - Oak fern	Bl Sx	Hm Pl	1200	700	600	2.0	Pl/Other	1.6/ 0.8
	ESSFmk	02	Bl/Pa - Cladonia	Pa Pl	Bl[4] Hm Sx	1000	500	400	2.0	Pl/Other	1.2/ 0.6
	ESSFmk	03	Bl/Hm - Cladonia	Pa Pl	Bl[4] Hm Sx	1200	700	600	2.0	Pl/Other	1.6/ 0.8
	ESSFmk	05	Bl/Hm - Devils Club - Lady Fern	Bl Sx	Hm Pl	1200	700	600	1.6	Pl/Other	1.6/ 0.8
	ESSFmk	06	Bl - Horsetail - Leafy moss	Bl Sx	Hm Ba	1000	500	400	2.0	All	0.80
	ESSFmk	07	Bl - Ladyfern - Horsetail	Bl Sx	Ba	1000	500	400	1.6	All	0.80
	ESSFmv3	03	Bl/Sb - Labrador tea	Bl Sx	Pl Sb	1000	500	400	2.0	Pl/Other	1.2/ 0.6
	ESSFmv3	07	Bl - Horsetail - Feathermoss	Bl Sx	Pl	1000	500	400	1.6	Pl/Other	1.2/ 0.6
	SBSdk	01,05, 06	Sxw - Spirea - Purple peavine Sxw - Spirea - Feathermoss Sxw - Twinberry - Coltsfoot	Pl Sx	Fd	1200	700	600	2.0	Fd/Pl/Other	1.4/2.0/1.0
	SBSwk3	03	Sxw/Fd - Purple peavine	Fd Pl Sx		1200	700	700	2.0	Fd/Pl/Other	1.4/2.0/1.0
	SBSdk	02	Pl - Juniper - Ricegrass	Pl[11]	Sx	1000	500	400	2.0	Pl/others	1.4/0.8
	SBSdk	03	Pl - Feathermoss - Cladina								
	SBSwk3	05	Sb - Labrador tea	Pl[11]	Sx Sb	1200	700	600	2.0	Pl/others	2.0/ 1.0
	SBSdk	04	Fd - Soopolallie - Feathermoss	Fd Pl Sx		1200	700	700	2.0	Fd/Pl/Other	1.4/2.0/1.0

Single Storied Stocking Standards[8, 9, 10]

	SB Sdk	07	Sxw - Horsetail	Sx[11]	Pl	1000	500	400	1.6	Pl/others	1.4/0.8
	SB Sdk	08	Act - Dogwood - Prickly rose	Sx[11]	Pl	1200	700	600	1.6	Pl/others	2.0/ 1.0
	SB Sdk	09	Sb - Creeping-snowberry -	Pl Sb	Sx	400	200	200	1.6	Pl/others	1.4/0.8
	SB Sdk	10	Sphagnum Sb - Soft-leaved sedge - Sphagnum	Pl Sb Sx		400	200	200	1.6	Pl/others	1.4/0.8
	SB Smc2	02	Pl - Huckleberry - Cladonia	Pl[11]	Bl[4] Sx	1000	500	400	2.0	Pl/Other	1.2/ 0.6
	SB Smc2	03	SbPl - Feathermoss	Pl Sx	Bl[4] Sb	1200	700	600	2.0	Pl/Other	1.6/ 0.8
	SB Smc2	07	Sxw - Scrub birch - Feathermoss	Pl Sb Sx	Bl[4]	1000	500	400	1.6	Pl/Other	1.2/ 0.6
	SB Smc2	12	SbSxw - Scrub Birch - Sedge	Sb Sx	Pl Bl[4]	400	200	200	1.6	Pl/Other	1.2/ 0.6
	SB Smc2	09	Sxw - Devil's club	Sx Bl	Pl[13]	1200	700	700	1.6	Pl/Other	1.6/ 0.8
	SB Smc2	10	Sxw - Horsetail	Sx Bl	Pl[4, 13]	1000	500	500	1.6	Pl/Other	1.2/ 0.6
	SB Swk3	01,04,06	Sxw - Oak fern Sxw - Huckleberry - Highbush Cranberry Sxw - Twinberry - Coltsfoot	Pl Sx	Bl[4]	1200	700	600	2.0	Pl/Other	2.0/1.0
	SB Swk3	02	Pl - Huckleberry - Cladina	Pl[11]	Bl[4] Sx	1000	500	400	2.0	Pl/Other	1.4/0.8
	SB Swk3	07	Sxw - Devil's club	Sx[11]	Pl Bl[4]	1200	700	600	1.6	Pl/Other	2.0/1.0
	SB Swk3	08	Sxw - Horsetail	Sx[11]	Pl Bl[4]	1000	500	400	1.6	Pl/Other	1.4/0.8

Footnote 2 Pl will be considered preferred where it is more likely than not that 20 years after the applicable commencement date, the stand
(i) will not conform to the applicable stocking standards, or
(ii) will be impeded in its growth because of adverse effects on the area
because of the effect of frost on the Spruce. Where this situation occurs and Pl is the only acceptable species MIN p = MIN pa

Footnote 3 Bl is preferred in riparian management areas, patch cut, shelterwood, and group selection silviculture systems. Where this situation occurs and Bl is the only acceptable species MIN p = MIN pa

Footnote 8 Within the Bulkley **FDU**, for all openings less than 2 hectares in NAR that are within a Core Ecosystem, the minimum height is 0.

Footnote 9 For all openings less than 1 hectare in NAR that are part of a "**minor salvage operation**" the following standards apply
- There are no preferred or acceptable species.
- The target, minimum preferred and acceptable, and minimum preferred number of well-spaced stems is 0.
- The MITD is 0.
- The minimum height is 0

When one of these openings is combined with other "**minor salvage operation**" openings to form a contiguous combined opening of greater than 1 hectare then this footnote no longer applies and the stocking standards in the table above will apply.

Footnote 10 Where the procedures outlined in the Stocking and Free Growing Survey Procedures Manual are used to determine compliance with these standards, then the maximum number of countable tress (M-Value) at any one plot is TSS/Plot Multiplier.

Footnote 11 Acceptable species will be considered preferred where it is more likely than not that 20 years after the applicable commencement date, the stand
(i) will not conform to the applicable stocking standards, or
(ii) will be impeded in its growth because of adverse effects on the area
because of the effect on the area of forest health factors that are affecting the preferred species. Where this situation occurs MIN p = MIN pa

Footnote 13 Pl will be considered Preferred where Pine makes up more than 25% of the preharvest stand composition of the Standard Unit. Where this situation occurs MIN p = MIN pa.

Multi Storied Stocking Standards[9,5,10]

	BGC Classification			Regeneration Guide: Species		Stocking Mature Layer **			Stocking Pole Layer **			Stocking Sapling Layer **			Stocking Regeneration Layer **			Free Growing Guide: Min. Height		
Standards ID	Zone/SZ	Series	Association	Preferred (p)	Acceptable (a)	Target	Minimum preferred and acceptable	Minimum preferred	Target	Minimum preferred and acceptable	Minimum preferred	Target	Minimum preferred and acceptable	Minimum preferred	Target	Minimum preferred and acceptable	Minimum preferred	MITD [4]	Species	Ht (metres)[8]
						Well-Spaced Stems/Ha			Well-Spaced Stems/Ha			Well-Spaced Stems/Ha			Well-Spaced Stems/Ha					
	ESSFmc	02, 03	Bl-Pl - Juniper - Cladonia Bl-Huckleberry-crowberry																	
	ESSFmv3	02	Bl-Pl - Crowberry - Cladina	Pl[11]	Sx Bl[4]	400	200	200	600	300	250	800	400	300	1000	500	400	2.0	Pl/Other	1.2/ 0.6
	ESSFmc	01, 05, 06	Bl-Huckleberry Leafy Liverwort Bl-Huckleberry-Thimbleberry Bl - Oak fern - Heron's bill																	
	ESSFmv3	01, 04, 06	Bl - Rhododendron - Feathermoss Bl - Oak fern - Knight's plume Sxw - Huckleberry -Highbush Cranberry	Bl Sx	Pl	600	300	250	800	400	300	1000	500	400	1200	700	600	2.0	Pl/Other	1.6/ 0.8
	ESSFmc	04	Bl - Huckleberry - Heron's Bill	Pl Sx Bl		600	300	300	800	400	400	1000	500	500	1200	700	700	2.0	Pl/Other	1.6/ 0.8
	SBSmc2	01,05,06	Sxw - Huckleberry Sxw - Twinberry - Coltsfoot Sxw - Oakfern	Pl Sx	Bl[4]	600	300	250	800	400	300	1000	500	400	1200	700	600	2.0	Pl/Other	1.6/ 0.8
	ESSFmc	07	Bl - Devils Club- Lady fern																	
	ESSFmv3	05	Bl - Devils Club - Rhododendron	Bl Sx	Pl	600	300	250	800	400	300	1000	500	400	1200	700	600	1.6	Pl/Other	1.6/ 0.8
	ESSFmc	08,09,10	Bl - Valerian - Sickle moss Bl- Horsetail-Glow moss Bl - Horsetail- Leafy moss	Bl Sx		400	200	200	600	300	300	800	400	400	1000	500	500	1.6	All	0.60
	ESSFmk	01, 04	BlHm - Twistedstalk BlHm - Oak fern	Bl Sx	Hm Pl	600	300	250	800	400	300	1000	500	400	1200	700	600	2.0	Pl/Other	1.6/ 0.8
	ESSFmk	02	BlPa - Cladonia	Pa Pl	Bl[3] Hm Sx	400	200	200	600	300	250	800	400	300	1000	500	400	2.0	Pl/Other	1.2/ 0.6
	ESSFmk	03	BlHm - Cladonia	Pa Pl	Bl[3] Hm Sx	600	300	250	800	400	300	1000	500	400	1200	700	600	2.0	Pl/Other	1.6/ 0.8
	ESSFmk	05	BlHm - Devils Club - Lady Fern	Bl Sx	Hm Pl	600	300	250	800	400	300	1000	500	400	1200	700	600	1.6	Pl/Other	1.6/ 0.8
	ESSFmk	06	Bl - Horsetail - Leafy moss	Bl Sx	Hm Ba	400	200	200	600	300	250	800	400	300	1000	500	400	2.0	All	0.80
	ESSFmk	07	Bl - Ladyfern - Horsetail	Bl Sx	Ba	400	200	200	600	300	250	800	400	300	1000	500	400	1.6	All	0.80
	ESSFmv3	03	BlSb - Labrador tea	Bl Sx	Pl Sb	400	200	200	600	300	250	800	400	300	1000	500	400	2.0	Pl/Other	1.2/ 0.6
	ESSFmv3	07	Bl - Horsetail - Feathermoss	Bl Sx	Pl	400	200	200	600	300	250	800	400	300	1000	500	400	1.6	Pl/Other	1.2/ 0.6
	SBSdk	01, 05, 06	Sxw - Spirea - Purple peavine Sxw - Spirea - Feathermoss Sxw - Twinberry - Coltsfoot	Pl Sx	Fd	600	300	250	800	400	300	1000	500	400	1200	700	600	2.0	Fd/Pl/Other	1.4/2.0/1.0
	SBSwk3	03	SxwFd - Purple peavine	Fd Pl Sx		600	300	300	800	400	400	1000	500	500	1200	700	700	2.0	Fd/Pl/Other	1.4/2.0/1.0
	SBSdk	02	Pl - Juniper - Ricegrass	Pl[11]	Sx	400	200	200	600	300	250	800	400	300	1000	500	400	2.0	Pl/others	1.4/0.8
	SBSdk	03	Pl - Feathermoss - Cladina																	
	SBSwk3	05	Sb - Labrador tea	Pl[11]	Sx Sb	600	300	250	800	400	300	1000	500	400	1200	700	600	2.0	Pl/others	2.0/ 1.0
	SBSdk	04	Fd - Soopolallie - Feathermoss	Fd Pl Sx		600	300	300	800	400	400	1000	500	500	1200	700	700	2.0	Fd/Pl/Other	1.4/2.0/1.0
	SBSdk	07	Sxw - Horsetail	Sx[11]	Pl	400	200	200	600	300	250	800	400	300	1000	500	400	1.6	Pl/others	1.4/0.8
	SBSdk	08	Act - Dogwood - Prickly rose	Sx[11]	Pl	600	300	250	800	400	300	1000	500	400	1200	700	600	1.6	Pl/others	2.0/ 1.0
	SBSdk	09	Sb - Creeping-snowberry - Sphagnum	Pl Sb	Sx	200	100	100	300	125	125	300	150	150	400	200	200	1.6	Pl/others	1.4/0.8
	SBSdk	10	Sb - Soft-leaved sedge - Sphagnum	Pl Sb Sx		200	100	100	300	125	125	300	150	150	400	200	200	1.6	Pl/others	1.4/0.8
	SBSmc2	02	Pl - Huckleberry - Cladonia	Pl[11]	Bl[3] Sx	400	200	200	600	300	250	800	400	300	1000	500	400	2.0	Pl/Other	1.2/ 0.6
	SBSmc2	03	SbPl - Feathermoss	Pl Sx	Bl[3] Sb	600	300	250	800	400	300	1000	500	400	1200	700	600	2.0	Pl/Other	1.6/ 0.8
	SBSmc2	07	Sxw - Scrub birch - Feathermoss	Pl Sb Sx	Bl[3]	400	200	200	600	300	250	800	400	300	1000	500	400	1.6	Pl/Other	1.2/ 0.6
	SBSmc2	12	SbSxw - Scrub Birch - Sedge	Sb Sx	Pl Bl[3]	200	100	100	300	125	125	300	150	150	400	200	200	1.6	Pl/Other	1.2/ 0.6
	SBSmc2	09	Sxw - Devil's club	Sx Bl	Pl[12]	600	300	300	800	400	400	1000	500	500	1200	700	700	1.6	Pl/Other	1.6/ 0.8
	SBSmc2	10	Sxw - Horsetail	Sx Bl	Pl[2, 12]	400	200	200	600	300	300	800	400	400	1000	500	500	1.6	Pl/Other	1.2/ 0.6
	SBSwk3	01,04,06	Sxw - Oak fern Sxw - Huckleberry - Highbush Cranberry Sxw - Twinberry - Coltsfoot	Pl Sx	Bl[3]	600	300	250	800	400	300	1000	500	400	1200	700	600	2.0	Pl/Other	2.0/1.0
	SBSwk3	02	Pl - Huckleberry - Cladina	Pl[11]	Bl[3] Sx	400	200	200	600	300	250	800	400	300	1000	500	400	2.0	Pl/Other	1.4/0.8

	SB Swk3	07	Sxw - Devil's club	Sx[11]	Pl Bl[2]	600	300	250	800	400	300	1000	500	400	1200	700	600	1.6	Pl/Other	2.0/1.0
	SB Swk3	08	Sxw - Horsetail	Sx[11]	Pl Bl[2]	400	200	200	600	300	250	800	400	300	1000	500	400	1.6	Pl/Other	1.4/0.8

Footnote 2 Pl will be considered preferred where it is more likely than not that 20 years after the applicable commencement date, the stand
(i) will not conform to the applicable stocking standards, or
(ii) will be impeded in its growth because of adverse effects on the area
because of the effect of frost on the Spruce. Where this situation occurs and Pl is the only acceptable species MIN p = MIN pa

Footnote 3 Bl is preferred in riparian management areas, patch cut, shelterwood, and group selection silviculture systems. Where this situation occurs and Bl is the only acceptable species MIN p = MIN pa

Footnote 8 Within the Bulkley **FDU**, for all openings less than 2 hectares in NAR that are within a Core Ecosystem, the minimum height is 0.

Footnote 9 For all openings less than 1 hectare in NAR that are part of a "**minor salvage operation**" the following standards apply
- There are no preferred or acceptable species.
- The target, minimum preferred and acceptable, and minimum preferred number of well-spaced stems is 0.
- The MITD is 0.
- The minimum height is 0
When one of these openings is combined with other "**minor salvage operation**" openings to form a contiguous combined opening of greater than 1 hectare then this footnote no longer applies and the stocking standards in the table above will apply.

Footnote 10 Where the procedures outlined in the Stocking and Free Growing Survey Procedures Manual are used to determine compliance with these standards, then the maximum number of countable tress (M-Value) at any one plot is TSS/Plot Multiplier.

Footnote 11 Acceptable species will be considered preferred where it is more likely than not that 20 years after the applicable commencement date, the stand
(i) will not conform to the applicable stocking standards, or
(ii) will be impeded in its growth because of adverse effects on the area
because of the effect on the area of forest health factors that are affecting the preferred species. Where this situation occurs MIN p = MIN pa

Footnote 12 Minimum Intertree Distance (MITD) applies only to the Pole, Sapling and Regeneration Layers.

Footnote 13 Pl will be considered Preferred where Pine makes up more than 25% of the preharvest stand composition of the Standard Unit. Where this situation occurs MIN p = MIN pa.

****Stand Layer Definition**

Mature trees >= 12.5 cm dbh
Pole trees 7.5 cm to 12.4 cm dbh
Sapling trees >= 1.3 m height to 7.4 cm dbh
Regeneration trees < 1.3 m height

Appendix 3: Houston Division - Fine Filter Species and Site of Biological Significance Operational Control

Fine Filter Species and Site of Biological Significance Operational Controls

Species	Species Type	Habitat	Forest District	Data Listing Source	Distribution	Operational Controls	SFMP Indicators	Management Strategies
Bull Trout	Fish	Lacustrine Riverine	DJA, DND, DSS_B	COSEWIC: None BC List Status: Blue	Potential to be found in all operating areas but critical habitat is generally cool, clear mountain streams, typically with an abundance of cobbles, stones, and coarse woody debris, and high elevation lakes. In the Morice TSA westernmost edge of the TSA (Gosnell Watershed, Nanika River, Upper Morice River Mainstem)	- Preworks - Inspections/ Supervision - Work Instructions - Approved Contractors - Field Marking Standards - Site Plan/ Prescription - A Field Guide to Species at Risk in Canfor's Planning Areas in Central Interior British Columbia - Road Layout and Design - Road Construction Standards - In-stream Work Window and Measures - Management Guidelines for Species and Plant Communities At Risk: Prince George Timber Supply Area (March 31, 2006)	FSJ: I10	Habitat for this species will be adequately managed through the use of: - Riparian Reserve Zones (RRZ) - Riparian Management Zones (RMZ) - Machine Free Zones (MFZ) - Pesticide Free Zones (PFZ) - Cutblock boundary layout - Road Construction Standards - In-stream Work Windows and Measures **In addition, avoid creating new permanent access within 500 meters of Bull Trout staging areas.**
Cutthroat Trout (clarkii subspecies)	Fish	Estuarine Lacustrine Marine Riverine	DND DSS_B	COSEWIC: None BC List Status: Blue	All operating areas within the Morice, Lakes and Bulkley Timber Supply Areas.	- Preworks - Inspections/ Supervision - Work Instructions - Approved Contractors - Field Marking Standards - Site Plan/ Prescription - A Field Guide to Species at Risk in Canfor's Planning Areas in Central Interior British Columbia - Road Layout and Design - Road Construction Standards - In-stream Work Window and Measures		Habitat for this species will be adequately managed through the use of: - Riparian Reserve Zones (RRZ) - Riparian Management Zones (RMZ) - Machine Free Zones (MFZ) - Pesticide Free Zones (PFZ) - Cutblock boundary layout - Road Construction Standards - In-stream Work Windows and Measures
Dolly Varden	Fish	Estuarine Lacustrine	DJA, DND,	COSEWIC: None	All operating areas. Critical habitat elements	- Preworks - Inspections/ Supervision	DJA: I10	Habitat for this species will be adequately managed through the use of:

Species	Species Type	Habitat	Forest District	Data Listing Source	Distribution	Operational Controls	SFMP Indicators	Management Strategies
		Marine Riverine	DSS_B DJA	BC List Status: Blue	include clear mountain streams, typically with an abundance of cobbles, stones and coarse woody debris.	- Work Instructions - Approved Contractors - Field Marking Standards - Site Plan/ Prescription - A Field Guide to Species at Risk in Canfor's Planning Areas in Central Interior British Columbia - Road Layout and Design - Road Construction Standards - In-stream Work Window and Measures - Management Guidelines for Species and Plant Communities At Risk: Prince George Timber Supply Area (March 31, 2006)		- Riparian Reserve Zones (RRZ) - Riparian Management Zones (RMZ) - Machine Free Zones (MFZ) - Pesticide Free Zones (PFZ) - Cutblock boundary layout - Road Construction Standards - In-stream Work Windows and Measures
White Sturgeon (Nechako River Population)	Fish	Estuarine Lacustrine Marine Riverine	DJA	COSEWIC: Endangered BC List Status: Red	Fort St James District Middle River, Takla Lake. Critical habitat elements include large cool rivers or steams, and large lakes.	- Preworks - Inspections/ Supervision - Work Instructions - Approved Contractors - Field Marking Standards - Site Plan/ Prescription - A Field Guide to Species at Risk in Canfor's Planning Areas in Central Interior British Columbia - Road Layout and Design - Road Construction Standards - In-stream Work Window and Measures - Management Guidelines for Species and Plant Communities At Risk: Prince George Timber	DJA: I10	Habitat for this species will be adequately managed through the use of: - Riparian Reserve Zones (RRZ) - Riparian Management Zones (RMZ) - Machine Free Zones (MFZ) - Pesticide Free Zones (PFZ) - Cutblock boundary layout - Road Construction Standards - In-stream Work Windows and Measures

Species	Species Type	Habitat	Forest District	Data Listing Source	Distribution	Operational Controls	SFMP Indicators	Management Strategies
						Supply Area (March 31, 2006)		
American Bittern	Bird	Estuarine Palustrine	DND, DSS_B DJA	COSEWIC: None BC List Status: Blue	All operating areas within the Fort St James, Morice, Lakes and Bulkley Timber Supply Areas. Wetlands with tall, emergent vegetation, and lakes and rivers bordered by wet alder and willow thickets	- Preworks - Inspections/ Supervision - Work Instructions - Approved Contractors - Field Marking Standards - Site Plan/ Prescription - A Field Guide to Species at Risk in Canfor's Planning Areas in Central Interior British Columbia	N/A	Habitat for this species will be adequately managed through the use of: - Riparian Reserve Zones (RRZ) - Riparian Management Zones (RMZ) - cutblock boundary layout
Olive-Sided Flycatcher	Bird	Palustrine Terrestrial	DND, DSS_B DJA	COSEWIC: Threatened BC List Status: Blue	All operating areas within the Fort St James, Morice, Lakes and Bulkley Timber Supply Areas. Breeds in forest and woodland, especially in burned-over areas with standing dead trees and in subalpine coniferous forest and mixedwood forests. Non-breeding includes a variety of forest, woodland, and open situations with scattered trees. Primary habitat is mature, evergreen montane forest.	- Preworks - Inspections/ Supervision - Work Instructions - Approved Contractors - Field Marking Standards - Site Plan/ Prescription - A Field Guide to Species at Risk in Canfor's Planning Areas in Central Interior British Columbia	N/A	- Application of coarse woody debris best management practices - Riparian management strategies - Retention strategies including single stem retention, non-merchantable retention, group rentetion, and partial cutting. - Cutblock boundary layout
Rusty Blackbird	Bird	Palustrine Terrestrial	DJA DSS_B	COSEWIC: Special Concern BC List Status: Blue	Operating areas within the Fort St James and Bulkley Timber Supply Areas. During breeding moist woodland, bushy bogs, wooded edges of water courses. Nest in tree or shrub, usually in or near water. Non-breeding in	- Preworks - Inspections/ Supervision - Work Instructions - Approved Contractors - Field Marking Standards - Site Plan/ Prescription - A Field Guide to Species at Risk in Canfor's Planning Areas in Central Interior	N/A	Habitat for this species during breeding phase will be adequately managed through the use and application of: - Riparian Reserve Zones (RRZ) - Riparian Management Zones (RMZ) - Cutblock boundary layout

Species	Species Type	Habitat	Forest District	Data Listing Source	Distribution	Operational Controls	SFMP Indicators	Management Strategies
					open woodland, scrub, pastures and cultivated lands less common for forestry operations.	British Columbia		
Great Blue Heron (*herodias* subspecies)	Bird	Lacustrine Palustrine Riverine Terrestrial	DND, DSS_B	COSEWIC: None BC List Status: Blue	Potential to be found in the Bulkley, Morice and Lakes Timber Supply Areas. Critical habitat elements include forested habitats close to food-rich wetlands, riparian sites, and agricultural fields.	- Preworks - Inspections/ Supervision - Work Instructions - Approved Contractors - Field Marking Standards - Site Plan/ Prescription - A Field Guide to Species at Risk in Canfor's Planning Areas in Central Interior British Columbia	N/A	Habitat for this species will be adequately managed through the use of: - Riparian Reserve Zones (RRZ) - Riparian Management Zones (RMZ) - Cutblock boundary layout
Sandhill Crane	Bird	Lacustrine Palustrine Riverine Terrestrial	DND, DSS_B DJA	COSEWIC: Not At Risk BC List Status: Blue	All operating areas within the Morice, Lakes, Fort St James and Bulkley Timber Supply Areas. Critical habitat elements include isolated and undisturbed wetlands (> 1ha) with abundant emergent vegetation surrounded by forest cover.	- Preworks - Inspections/ Supervision - Work Instructions - Approved Contractors - Field Marking Standards - Site Plan/ Prescription - A Field Guide to Species at Risk in Canfor's Planning Areas in Central Interior British Columbia - Management Guidelines for Species and Plant Communities At Risk: Prince George Timber Supply Area (March 31, 2006)	DJA: I10	Habitat for this species will be adequately managed through the use of: - Riparian Reserve Zones (RRZ) - Riparian Management Zones (RMZ) - Cutblock boundary layout

Fine Filter Species and Site of Biological Significance Operational Controls

Species	Species Type	Habitat	Forest District	Data Listing Source	Distribution	Operational Controls	SFMP Indicators	Management Strategies
Swainsons Hawk	Bird	Palustrine Terrestrial	DND DSS_B	COSEWIC: None BC List Status: Red	All operating areas within the Morice, Lakes and Bulkley Timber Supply Areas. Habitata includes open woodlands with mixed forests and groves adjacent to grasslands, farmlands, and wetlands	- Preworks - Inspections/ Supervision - Work Instructions - Approved Contractors - Field Marking Standards - Site Plan/ Prescription - A Field Guide to Species at Risk in Canfor's Planning Areas in Central Interior British Columbia	N/A	As these species are primarily open country (farmland, grasslands, wetlands etc) foragers, management of nesting habitat will be through the standard practices of using WTP's, RRZ near open country habitat and by protection of nests when they are encountered in the field.
Peregrine Falcon (anatum subspecies)	Bird	Estuarine Terrestrial	DND DSS_B	COSEWIC: Special Concern BC List Status: Red	All operating areas within the Morice, Lakes and Bulkley Timber Supply Areas. Anatum Peregrine Falcons typically nest on rock cliffs above lakes or river valleys where abundant prey is nearby. Interior populations are typically associated with wetland habitats that support a sufficient prey base.	- Preworks - Inspections/ Supervision - Work Instructions - Approved Contractors - Field Marking Standards - Site Plan/ Prescription - A Field Guide to Species at Risk in Canfor's Planning Areas in Central Interior British Columbia	N/A	
Short-Eared Owl	Bird	Estuarine Terrestrial Palustrine	DSS_B DND DJA	COSEWIC: Special Concern BC List Status: Blue	All operating areas within the Bulkley Timber Supply Area. Critical elements include open country such as fields, grassland, grassy or bushy meadows, marshlands sloughs, and previously forested areas that have been cleared.	- Preworks - Inspections/ Supervision - Work Instructions - Approved Contractors - Field Marking Standards - Site Plan/ Prescription - A Field Guide to Species at Risk in Canfor's Planning Areas in Central Interior British Columbia	N/A	

Fine Filter Species and Site of Biological Significance Operational Controls

Species	Species Type	Habitat	Forest District	Data Listing Source	Distribution	Operational Controls	SFMP Indicators	Management Strategies
Rough-legged Hawk	Bird	Terrestrial Palustrine	DSS_B DND DJA	COSEWIC: None BC List Status: Blue	All operating areas. Nonbreeding: grasslands, field, marshes, sagebrush flats, and open cultivated areas. Nests on cliffs (typically), mountain sides, forests with plenty of open ground. Sometimes nests on the ground or on man-made structures. Nests more commonly along coasts and on marine islands. Based on range maps bird primarily migatory in our operating areas.	- Preworks - Inspections/ Supervision - Work Instructions - Approved Contractors - Field Marking Standards - Site Plan/ Prescription - A Field Guide to Species at Risk in Canfor's Planning Areas in Central Interior British Columbia	N/A	
Barn Swallow	Bird	Terrestrial Palustrine	DJA, DND, DSS_B	COSEWIC: None BC List Status: Blue	All operating areas. Open situations, less frequently in partly open habitats, frequently near water (AOU 1983). Nests in barns or other buildings, under bridges, in caves or cliff crevices, usually on vertical surface close to ceiling. Commonly reuses old nests. Usually returns to same nesting area in successive years; yearlings often return to within 30 km or closer to natal site (Turner and Rose 1989, Shields 1984).	- Preworks - Inspections/ Supervision - Work Instructions - Approved Contractors - Field Marking Standards - Site Plan/ Prescription - A Field Guide to Species at Risk in Canfor's Planning Areas in Central Interior British Columbia - Sustainable Forest Management Plan - Management Guidelines for Species and Plant Communities At Risk: Prince George Timber Supply Area (March 31, 2006)	DJA: I10	As these species are primarily open country (farmland, grasslands, wetlands etc) foragers, management of nesting habitat will be through the standard practices of using WTP's, RRZ near open country habitat and by protection of nests when they are encountered in the field.

Fine Filter Species and Site of Biological Significance Operational Controls

Species	Species Type	Habitat	Forest District	Data Listing Source	Distribution	Operational Controls	SFMP Indicators	Management Strategies
Sharp-tailed Grouse (columbianus subspecies)	Bird	Palustrine Terrestrial	DND	COSEWIC: None BC List Status: Blue	All Operating Areas within the Morice and Lakes TSA. Native bunchgrass and shrub-steppe communities. In general prefer habitats with moderate vegetative cover, high plant species diversity, and high structural diversity; in general selected vegetative communities that were least modified by livestock grazing (Saab and Marks 1992). Deciduous shrubs are critical for winter food and escape cover (see Saab and Marks 1992). Bunchgrasses and perennial forbs are important components of nesting and brood-rearing habitat (Saab and Marks 1992).	- Preworks - Inspections/ Supervision - Work Instructions - Approved Contractors - Field Marking Standards - Site Plan/ Prescription - A Field Guide to Species at Risk in Canfor's Planning Areas in Central Interior British Columbia - Sustainable Forest Management Plan	N/A	

Fine Filter Species and Site of Biological Significance Operational Controls

Species	Species Type	Habitat	Forest District	Data Listing Source	Distribution	Operational Controls	SFMP Indicators	Management Strategies
Double-crested Cormorant	Bird	Estuarine Lacustrine Marine Palustrine Riverine Terrestrial	DND	COSEWIC: Not At Risk BC List Status: Blue	Lakes, ponds, rivers, lagoons, swamps, coastal bays, marine islands, and seacoasts; usually within sight of land. Nests on the ground or in trees in freshwater situations, and on coastal cliffs (usually high sloping areas with good visibility). See Spendelow and Patton (1988) for further details on nesting sites in different geographic areas.	- Preworks - Inspections/ Supervision - Work Instructions - Approved Contractors - Field Marking Standards - Site Plan/ Prescription - A Field Guide to Species at Risk in Canfor's Planning Areas in Central Interior British Columbia - Sustainable Forest Management Plan	N/A	Very low likelihood of this species occurring within our areas of operation. Species tend to frequent coastal environments.
Black-footed Tightcoil (Snail)	Invertebrate	Terrestrial	DSS_B	COSEWIC: None BC List Status: Blue	Found in bulkley operating areas within the SBS and ESSF biogeoclimatic zones. In the Babine Range, Hazelton Mountains, near Smithers, this species has been found under rocks, dead wood and moss, at and below the tree line at altitudes of 1158-1524 m, in old slide areas, melt-water run-off areas and spruce forests. One documented occurrence is along Driftwood Creek in the Babine Mountains (Forsyth 2003a).	- Preworks - Inspections/ Supervision - Work Instructions - Site Plan/ Prescription - Approved Contractors - Coarse Woody Debris Best Management Practices - Field Marking Standards - Site Plan/ Prescription - A Field Guide to Species at Risk in Canfor's Planning Areas in Central Interior British Columbia - Sustainable Forest Management Plan	N/A	The known distribution of species is limited in range and scope of operations within known occurances is also limited. When operating in possible habitat areas in sub-alpine forests it is critical that moist micro-climates are maintained and possibility of dessication at the forest floor is limited. Management strategies to maintain habitat attributes will include: - Application of coarse woody debris best management practices - Riparian management strategies - Retention strategies including single stem retention, non-merchantable retention, group rentetion, and partial cutting.

Fine Filter Species and Site of Biological Significance Operational Controls

Species	Species Type	Habitat	Forest District	Data Listing Source	Distribution	Operational Controls	SFMP Indicators	Management Strategies
Northern Tightcoil (Snail)	Invertebrate	Palustrine Terrestrial	DND DSS	COSEWIC: None BC List Status: Blue	Found in operating areas within the ESSF and ICH biogeoclimatic zones. Found on leaf litter of deciduous trees, on the underside of woody debris, and in moist meadows at higher elevations (up to 1200 m). Large and small woody debris, grasses, sedges, forbs, and shrubs are important habitat components within these sites. Areas of habitat are generally small and occur at relatively high elevations.			The known distribution of species is limited in range and scope of operations within known occurances is also limited. When operating in possible habitat areas in sub-alpine forests it is critical that moist micro-climates are maintained and possibility of dessication at the forest floor is limited. Management strategies to maintain habitat attributes will include: - Application of coarse woody debris best management practices - Riparian management strategies - Retention strategies including single stem retention, non-merchantable retention, group rentetion, and partial cutting.
Fisher	Mammal	Palustrine Terrestrial	DJA, DND, DSS_B	COSEWIC: None BC List Status: Blue	All operating areas. Generally around large cottonwood sites. Critical habitat attributes include late-sucessional (80 year-old) coniferous and mixed coniferous-deciduous forests, with an advanced structural stage (>6), a 30-60% canopy closure, and >20m2/ha basal area in mature trees. (Morice/Bulkley river floodplains, etc)	- Preworks - Inspections/ Supervision - Work Instructions - Approved Contractors - Field Marking Standards - Site Plan/ Prescription - A Field Guide to Species at Risk in Canfor's Planning Areas in Central Interior British Columbia - Sustainable Forest Management Plan - Management Guidelines for Species and Plant Communities At Risk: Prince George Timber Supply Area (March 31, 2006)	DJA: I10	Management strategy will be to avoid harvesting on key habitat areas such as the active floodplain areas of the Morice/Bulkley River systems (large cottonwood sites) Also related to SBSdk/08 ecosystems (see below). Important habitat features include large coarse woody debris, witches brooms, decrepit large deciduous trees and shrub cover. As such application of coarse woody debris best management practices crtical in high value habitat areas.
Rocky Mountain	Invertebrate	Lacustrine	DND DSS_B	COSEWIC: Not At	All operating areas within the Bulkley TSA. Habitat	- Preworks - Inspections/ Supervision	N/A	Habitat for this species will be adequately managed through the use of:

Fine Filter Species and Site of Biological Significance Operational Controls

Species	Species Type	Habitat	Forest District	Data Listing Source	Distribution	Operational Controls	SFMP Indicators	Management Strategies
Capshell (Freshwater Limpit)				Risk BC List Status: Blue	is high altitude lakes and ponds. Rocky substrates, small drainage basins (< 250 ha), and macrophytic vegetation are often (but not always) associated (Riebesell et al., 2001).	- Work Instructions - Approved Contractors - Field Marking Standards - Site Plan/ Prescription - A Field Guide to Species at Risk in Canfor's Planning Areas in Central Interior British Columbia - Sustainable Forest Management Plan		- Riparian Reserve Zones (RRZ) - Riparian Management Zones (RMZ) - Machine Free Zones (MFZ) - Pesticide Free Zones (PFZ) - Cutblock boundary layout - Road Construction Standards
Wolverine (luscus subspecies)	Mammal	Terrestrial	DJA, DND, DSS_B	COSEWIC: Special Concern BC List Status: Blue	All operating areas. Females tend to inhabit higher elevations with early sucessional (alpine-type) and late sucessional (coniferous forests) stands in summer, during rearing season; females in winter and males all year-round, tend to use lower elevations with late sucessional stands.	- Preworks - Inspections/ Supervision - Work Instructions - Approved Contractors - Field Marking Standards - Site Plan/ Prescription - A Field Guide to Species at Risk in Canfor's Planning Areas in Central Interior British Columbia - Management Guidelines for Species and Plant Communities At Risk: Prince George Timber Supply Area (March 31, 2006)	DJA: I10	The use of coarse filter, landscape level biodiversity objectives (patch, seral, RDI, etc) will adequately manage for wolverine habitat. For important habitat features such as rock piles and avalanche chuts exclude from harvest. For den identification for wolverine refer to the "Carnivore Ground Dens Indetification Guide" located on the FMS site. When dens are identified exlcude from harvest area and buffer appropriatelt to maintain integrity of feature.
Grizzly Bear	Mammal	Palustrine Riverine Terrestrial	DJA, DND, DSS_B	COSEWIC: Special Concern BC List Status: Blue	All operating areas. Critical habitat elements include mosaic of non-forested sites, immature, young and late sucessional stands. Bears frequent avalanche chutes, salmon streams, riparian sites rich in succulent vegetation. Have mapping of habitat areas for Morice (LRMP) \\Hnsmfs01\HN_GIS\strat	- Preworks - Inspections/ Supervision - Work Instructions - Approved Contractors - Field Marking Standards - FDP Strategies - Site Plan/ Prescription - A Field Guide to Species at Risk in Canfor's Planning Areas in Central Interior British Columbia - Sustainable Forest	DJA: I10 DND: M37, M39, M46	Until the LRMP Best Management Practices are developed the management strategy will be to use coarse filter, landscape level biodiversity objectives (patch, seral, RDI, etc) to manage for Grizzly Bear habitat. Once the LRMP Best Management Practices (Objective 4 - Grizzly Bear) are developed, these practices will be followed. For den identification for grizzly bear refer to the "Carnivore Ground Dens Indetification Guide" located on the FMS site.

Species	Species Type	Habitat	Forest District	Data Listing Source	Distribution	Operational Controls	SFMP Indicators	Management Strategies
					egic_data\SFM_IFPA\Morice_IMS_data_download\LRMP Grizzly Bear Management Areas (Morice) - Tag 650	Management Plan - Management Guidelines for Species and Plant Communities At Risk: Prince George Timber Supply Area (March 31, 2006)		
Caribou (Northern Mountain Population)	Mammal	Palustrine Terrestrial	DJA, DND, DSS_B	COSEWIC: Threatened/ Special Concern BC List Status: Blue	Takla Herd Tweedsmuir Herd Telkwa Herd In mid and late winter they inhabit either low-elevation forested winter ranges, or high elevation alpine/subalpine winter ranges to feed on terrestrial lichens. In spring, they are found between late winter and high elevation summer ranges, where forage is abundant. We have mapping of the critical habitat areas in the Morice TSA \\Hnsmfs01\HN_GIS\strategic_data\SFM_IFPA\Morice_IMS_data_download\LRMP Comprehensive Caribou (Morice) - Tag 648	- Preworks - Inspections/ Supervision - Work Instructions - Approved Contractors - Field Marking Standards - Site Plan/ Prescription - A Field Guide to Species at Risk in Canfor's Planning Areas in Central Interior British Columbia - Sustainable Forest Management Plan - FSP results and strategies - Management Guidelines for Species and Plant Communities At Risk: Prince George Timber Supply Area (March 31, 2006)	DJA: I10 DND: M31, M37, M39, M46	When development is planned in any of the identified Caribou habitat areas, the following management strategies will be applied: - **Telkwa Caribou Herd:** Follow the interim guidelines in the Telkwa Caribou Herd Recovery Plan until such time as the Species at Risk Recovery Plan is completed for the Telkwa herd. Once the Species at Risk Recovery Plan is completed follow those guidelines. **- Takla Herd:** The General Wildlife Measures specified in Order – Ungulate Winter Range #U7-003 will be followed. **- Tweedsmuir Herd:** Guidelines from the recovery action plan for the Tweedsmuir herd will be followed once the recovery action plan has been completed.
Mountain Goat	Mammal	Terrestrial	DND, DSS_B DJA	COSEWIC: None BC List Status: Yellow	All operating areas within the Bulkley, Morice and Lakes Timber Supply Areas.Alpine and	- Preworks - Inspections/ Supervision - Work Instructions - Approved Contractors - Field Marking Standards-FSP Results and Strategies	DND: M31, M46	Check for the presence of mountain goats, trails, hair, or in key habitat areas (e.g. consult with local resource users and/or Guide Outfitters) prior to development. Where the presence of mountain goats is confirmed: - Where feasible incorporate Old Growth Areas in

Species	Species Type	Habitat	Forest District	Data Listing Source	Distribution	Operational Controls	SFMP Indicators	Management Strategies
					subalpine habitat; steep grassy talus slopes, grassy ledges of cliffs, or alpine meadows. Usually at timberline or above. May seek shelter and food in stands of spruce or hemlock in winter. Young are born on rock ledges or steep cliffs. We have extensive mapping of actual and potential habitat areas \\Hnsmfs01\HN_GIS\strategic_data\SFM_IFPA\Morice_IMS_data_download\LRMP Goat Habitat (Morice) - Tag 649	- Site Plan/ Prescription - Sustainable Forest Management Plan		and/or around occupied goat habitat areas. - Maintaining a minimum of 70% of the forested area in goat habitat areas in suitable thermal cover where the habitat use has been confirmed. - Increasing yarding distance and modifying road locations to reduce road density - Use low impact, winter, or temporary roads to minimize access. - Use deactivation, access control or road rehabilitation to achieve the road density target.
Western Meadow Fritillary Boloria epithore sigridae (Butterfly)	Invertebrate	Terrestrial	DJA	COSEWIC: None BC List Status: Blue	Found in the ESSF biogeoclimatice zone. Is the most abundant lesser fritillary in southern British Columbia; it becomes increasingly less common northwards. This is mainly a mountain and foothill species in Canada. It is most often found in sunny openings in mixed deciduous-evergreen forests, but strays out into meadows and roadsides.	- Preworks - Inspections/ Supervision - Work Instructions - Approved Contractors - Field Marking Standards - Site Plan/ Prescription - A Field Guide to Species at Risk in Canfor's Planning Areas in Central Interior British Columbia - Management Guidelines for Species and Plant Communities At Risk: Prince George Timber Supply Area (March 31, 2006)	DJA: I10	

Fine Filter Species and Site of Biological Significance Operational Controls

Species	Species Type	Habitat	Forest District	Data Listing Source	Distribution	Operational Controls	SFMP Indicators	Management Strategies
Bourgeau's milk-vetch	Vascular Plant	Palustrine Terrestrial	DJA	COSEWIC: None BC List Status: Blue	Found in the AT biogeoclimatice zone.	- Preworks - Inspections/ Supervision - Work Instructions - Approved Contractors - Field Marking Standards - Site Plan/ Prescription - A Field Guide to Species at Risk in Canfor's Planning Areas in Central Interior British Columbia - Management Guidelines for Species and Plant Communities At Risk: Prince George Timber Supply Area (March 31, 2006)	DJA: I10	**Pre-harvest:** Management strategy is to avoid harvesting or road construction within areas containing vascular plants at risk. They will be identified by field staff/contractors and removed from harvesting by modifying the layout, putting the area in a WTP, etc. Verification that no rare ecosystems are planned for harvesting will be conducted during the development of the site plan and additionally during the peer review. If it is necessary to modify a site containing vascular plants at risk bring to the attention of supervisor for development of management strategy options. When considering alteration of a site comprised of listed vascualr plants consider legal versus non-legal designation, professional relaionce, relative scarcity of occurance, quality and size of occurance, and known threats to occurance that reduce its viability. **Post-harvest:** Where areas containing vascular plants at risk are identified post harvest establish MFZ around extent of occurrence and exclude from brushing, site preparation and any other treatments that may alter the dynamics of the ecosystem that the plants occur in. The following hyperlink identifies the steps to follow when a species at risk is identified for a
Northern Jacob's-ladder	Vascular Plant	Terrestrial	DJA	COSEWIC: None BC List Status: Blue	Found in the ESSFmv and AT biogeoclimatic subzones.		DJA: I10	
Elegant Jacob's-ladder	Vascular Plant	Terrestrial	DJA DSS_B	COSEWIC: None BC List Status: Blue	Found in the ESSFmv, AT and SBSdw biogeoclimatic subzones. None of the subzomes it occurs in are within the DSS_B.		DJA: I10	
Holboell's rockcress (var. pinetorum)	Vascular Plant	Terrestrial	DND	COSEWIC: None BC List Status: Blue	Found in the SBSdk biogeoclimatic subzone.		N/A	
Back's sedge	Vascular Plant	Terrestrial	DND DSS_B	COSEWIC: None BC List Status: Blue	Found in the SBSdk biogeoclimatic subzone.		N/A	

Fine Filter Species and Site of Biological Significance Operational Controls

Species	Species Type	Habitat	Forest District	Data Listing Source	Distribution	Operational Controls	SFMP Indicators	Management Strategies
Alp lily (var fava)	Vascular Plant	Terrestrial	DND	COSEWIC: None BC List Status: Blue	Found in the AT biogeoclimatice zone.		N/A	
Western Jacob's-ladder	Vascular Plant	Palustrine Terrestrial	DND	COSEWIC: None BC List Status: Blue	Found in the ESSFmv and SBSmc biogeoclimatic subzones.		N/A	
Purple oniongrass	Vascular Plant	Palustrine Terrestrial Riverine	DND	COSEWIC: None BC List Status: Blue	Found in the SBSdk and AT biogeoclimatic subzone.		N/A	
Kruckeberg 's Holly Fern	Vascular Plant	Terrestrial	DJA	COSEWIC: None BC List Status: Blue	Found in the SBSwk3 biogeoclimatic subzone. Subalpine cliffs and talus slopes. The species should be looked for on ultrafamic (alkaline igneous rocks) rocks		N/A	
Alpine, Baffin Bay, Lance-Fruited, and Coast Mountain Draba	Vascular Plants	Terrestrial (Riverine – Baffin Bay Draba only)	DSS_B	COSEWIC: None BC List Status: Blue	Found in the BAFA biogeoclimatice zone. Dry meadows, cliffs, rocky slopes and scree slopes in the subalpine and alpine zones.		N/A	

Fine Filter Species and Site of Biological Significance Operational Controls

Species	Species Type	Habitat	Forest District	Data Listing Source	Distribution	Operational Controls	SFMP Indicators	Management Strategies
Cryptic Paw	Lichen	Terrestrial	DSS_B	COSEWIC: Special Concern BC List Status: Blue	Found in the ICH and CWH biogeolclimatice zones.		N/A	
Whitebark Pine	Vascular Plant	Terrestrial	DND DSS DJA	COSEWIC: None BC List Status: Blue	Found in the BAFAun, ESSFmc, ESSFmcp, ESSFmk, ESSFmkp, ESSFmv, ESSFmvp, SBSmc, SBSwk		N/A	
Diverse-leaved cinquefoil (var perdissecta)	Vascular Plant	Terrestrial	DND	COSEWIC: None BC List Status: Blue	Found in the AT biogeoclimatice zone.		N/A	
Small-fruited willowherb	Vascular Plant	Palustrine Terrestrial Riverine	DSS_B	COSEWIC: None BC List Status: Blue	Found in the BAFA biogeoclimatic zone.		N/A	
Snow pearlwort	Vascular Plant	Palustrine Terrestrial	DSS_B	COSEWIC: None BC List Status: Blue	Found in the BAFA, SBSmc and AT biogeoclimatic subzones.		N/A	
CWH ws2/04 - amabilis fir - western redcedar / oak fern	Plant Community	Forest	DND DSS	BC List Status: Blue	Westernmost edge of the Morice TSA (Morice Lake/Gosnell) Very low likelyhood that we will be harvesting in these areas. Increased	- Preworks - Inspections/ Supervision - Work Instructions - Approved Contractors - Field Marking Standards - Site Plan/ Prescription	DND: M31, M46 DJA: I10	The preferred management strategy is to avoid harvesting or road construction within these ecosystems. They will be identified by field staff/contractors and removed from harvesting by modifying the layout, putting the area in a WTP, etc. Verification that no rare ecosystems are

Species	Species Type	Habitat	Forest District	Data Listing Source	Distribution	Operational Controls	SFMP Indicators	Management Strategies
CWHws2/07 - Sitka spruce / salmonberry Wet Submaritime 2	Plant Community	Riparian, Forest	DND DSS	BC List Status: Blue	dilligence should be exercised when conducting fieldwork in areas transitional into the CWHws2.	- Site Plan Peer Review Form - A Field Guide to Species at Risk in Canfor's Planning Areas in Central Interior British Columbia - Sustainable Forest Management Plan - Management Guidelines for Species and Plant Communities At Risk: Prince George Timber Supply Area (March 31, 2006) - Riparian Reserve Zones (RRZ) - Riparian Management Zones (RMZ) - Machine Free Zones (MFZ) - Pesticide Free Zones (PFZ) - Cutblock boundary layout - Road Construction Standards		planned for harvesting in new Road Permits or Cutting Permits will be conducted during the development of the site plan and additionally during the peer review. In situations where it is necessary to harvest and/or modify an area containing a species at risk bring to the attention of supervisor for development of management strategy options. Factos to consider when assessing possible harvest of a plant community should include legal versus non-legal designation, professional relaionce, relative scarcity of occurance, quality and size of occurance, and known threats to occurance that reduce its viability. For previously approved Road Permits and Cutting Permits that did not need to consider species at risk a peer review should be completed to assess if any species at risk are located within the area of interest and if so what management options are available. The following hyperlink identifies the steps to follow when a species at risk is identified for a given area: vascualr plants_plant community_management_strategies.jpg
CWHws2/02 - lodgepole pine / kinnikinnick	Plant Community	Woodland, Forrest	DND DSS	BC List Status: Red				
CWHws2/03 – Western Hemlock – Lodgepole pine /red-stemmed feathermoss	Plant Community	Forrest	DND	BC List Status: Blue				
CWHws2/08 - black cottonwood / red-alder / salmonberry	Plant Community	Riparian, Forest	DND DSS	BC List Status: Blue				
CWHws2/Wf51 – Sitka sedge / peat-mosses	Plant Community	Wetland, Herbaceous	DND	BC List Status: Red				
SBSdk/81 - saskatoon / slender wheatgrass	Plant Community	Shrub, Herbaceous, Grassland	DND	BC List Status: Red	Steep south facing grassy slopes with little or no tree cover. According to BEC Mapping no SBSdk in operating areas within the DJA and DSS.			

Fine Filter Species and Site of Biological Significance Operational Controls

Species	Species Type	Habitat	Forest District	Data Listing Source	Distribution	Operational Controls	SFMP Indicators	Management Strategies
SBSdk/02 - lodgepole pine / common juniper / rough-leaved ricegrass	Plant Community	Woodland, Forest	DND	BC List Status: Blue	Poorer growing Pl sites on upper or crests of slopes on shallow dry soils. According to BEC Mapping no SBSdk in operating areas within the DJA and DSS.			
SBSdk/82 - Sandberg's bluegrass - slender wheatgrass	Plant Community	Grassland, Herbaceous	DND	BC List Status: Red	Steep south facing grassy slopes with little or no tree cover. According to BEC Mapping no SBSdk in operating areas within the DJA and DSS.			
SBSdk/08 - (balsam poplar, black cottonwood) - spruces / red-osier dogwood	Plant Community	Riparian, Forest	DND	BC List Status: Red	Found on active floodplains near large river systems (Morice/Bulkley river floodplains). According to BEC Mapping no SBSdk in operating areas within the DJA and DSS.			
SBSdk/04 - Douglas-fir / red-stemmed feathermoss - step moss	Plant Community	Forest	DND	BC List Status: Blue	Site dominated by Douglas Fir (Fd). (Could be encountered in the Lakes TSA but not likely to be encountered within our operating areas). According to BEC Mapping no SBSdk in operating areas within the DJA and DSS.			
SBSdk/Wf05 - slender sedge / common hook-moss	Plant Community	Wetland, Herbaceous	DND DSS	BC List Status: Blue	Non-forested wetland (Fen). According to BEC Mapping no SBSdk in operating areas within the DJA and DSS.			

Fine Filter Species and Site of Biological Significance Operational Controls

Species	Species Type	Habitat	Forest District	Data Listing Source	Distribution	Operational Controls	SFMP Indicators	Management Strategies
SBSdk/FI02 – Mountain alder / red-osier dogwood / lady fern	Plant Community	Riparian, Shrub, Wetland	DND	BC List Status: Blue	Predominatly non-forested plant communities or in the case of the SBSdk09/Wb01 non-merchantable treed plant communities. According to BEC Mapping no SBSdk in operating areas within the DJA and DSS districts.			
SBSdk/Wm 04 – Common Spike-rush	Plant Community	Wetland, Herbaceous	DND	BC List Status: Blue				
SBSdk/Wm 02 – Swamp Horsetail – beaked sedge	Plant Community	Wetland, Herbaceous	DND	BC List Status: Blue				
SBSdk/Wf0 6 – Buckbean – Slender Sedge	Plant Community	Wetland Herbaceous	DND	BC List Status: Blue				
SBSdk/09 and SBSdkWb0 1 – Black spruce / buckbean / peat-mosses	Plant Community	Wetland, Forest	DND	BC List Status: Blue				
SBSdk/Ws0 3 – Bebb's willow / bluejoint reedgrass	Plant Community	Wetland, Shrub	DND	BC List Status: Blue				
SBSdk/FI05 – Drummond's willow / bluejoint reedgrass	Plant Community	Wetland, Shrub	DND	BC List Status: Blue				

Fine Filter Species and Site of Biological Significance Operational Controls

Species	Species Type	Habitat	Forest District	Data Listing Source	Distribution	Operational Controls	SFMP Indicators	Management Strategies
SBSdk/Ws05 – MacCalla's willow / beaked sedge	Plant Community	Wetland, Shrub, Herbaceous	DND	BC List Status: Blue				
SBSmc2/Wf10 – Hudson Bay clubrush / rusty hook-moss	Plant Community	Wetland, Herbaceous	DND, DSS_B	BC List Status: Red				
SBSmc2/Wb12 – scheuchzeria / peat-mosses	Plant Community	Wetland, herbaceous	DND, DSS_B	BC List Status: Blue				
SBSdk/Wf11 – Tufted clurush / golden star-moss	Plant Community	Wetland, Herbaceous	DND	BC List Status: Blue				
SBSmc2/Wf05 - slender sedge / common hook-moss	Plant Community	Wetland, Herbaceous	DJA, DND, DSS_B	BC List Status: Blue	Non-forested wetland (Fen).			
SBSmc2/Wf08 – shore sedge – buckbean / hook-mosses	Plant Community	Wetland, Herbaceous	DJA, DND, DSS_B	BC List Status: Blue	Non-forested wetland (Fen).			

Fine Filter Species and Site of Biological Significance Operational Controls

Species	Species Type	Habitat	Forest District	Data Listing Source	Distribution	Operational Controls	SFMP Indicators	Management Strategies
ESSFmv3 – timber oatgrass / reindeer lichen	Plant Community	Herbaceous, Alpine, Grassland	DJA, DND DSS_B	BC List Status: Red	Non-treed grassland			
ESSFmc/Wf13 – narrow-leaved cotton-grass – shore sedge	Plant Community	Wetland, Herbaceous	DJA, DND, DSS_B	BC List Status: Blue	Non-forested wetland (Fen).			
SBSmc2/Wf09 & ESSFmc/Wf09 – few-flowered spike-rush / hook mosses	Plant Community	Wetland, Herbaceous	DJA, DND, DSS_B	BC List Status: Red	Non-forested wetland (Fen).			
SBSwk3/02 - lodgepole pine / black huckleberry / reindeer lichens	Plant Community	Woodland, Forest	DJA, DND	BC List Status: Blue	East side of Morice TSA across Babine lake/FSJ district. Poorer growing Pl sites on upper or crests of slopes on shallow dry soils.			
SBSwk3/03 - Douglas-fir - hybrid white spruce / thimbleberry	Plant Community	Forest	DJA, DND	BC List Status: Blue	East side of Morice TSA across Babine lake/FSJ district. Site dominated by Douglas Fir Fd (Low likelihood of being encountered within our operating areas)			

Fine Filter Species and Site of Biological Significance Operational Controls

Species	Species Type	Habitat	Forest District	Data Listing Source	Distribution	Operational Controls	SFMP Indicators	Management Strategies
ESSF mc/11 & ESSFmc/Wb10 & SBSmc2/15 & SBSmc2/Wb10 – Lodgepole pine / few-flowered sedge / peat-mosses	Plant Community	Wetland, Forest, Woodland	DJA, DND, DSS_B	BC List Status: Blue	Treed Wetland.			
ESSFmk/02 & ESSFmk/03 – Whitebark pine / clad lichens – curly heron's bill moss	Plant Community	Forest Woodland	DND	BC List Status: Blue	Dry forested plant community.			
SBSmc2/16 & SBSmc2/Wb11 – Black spruce / buckbean / peat-mosses	Plant Community	Wetland, Forest	DJA, DND, DSS_B	BC List Status: Blue	Treed Wetland.			

Fine Filter Species and Site of Biological Significance Operational Controls

Species	Species Type	Habitat	Forest District	Data Listing Source	Distribution	Operational Controls	SFMP Indicators	Management Strategies
Sites of Biological Significance – refer to list under Distribution	Sites of Biological Significance	N/A	DJA	Fort St James SFMP V3.5	Applicable to the Fort St James Area Under the Plan. Sites of Biological Significance can Include but is Not Limited to the Following: Large Stick Nests, Snags, Overstory Trees, CWD, Witches Broom, Mineral Licks, Rock Features, Denning Sites, Avalanche Shoots, Ecological Reserves, Other Sites of Significance identified by the PAG from Time to Time.	- Site Plan/ Prescription - Site Plan Peer Review Form - A Field Guide to Species at Risk in Canfor's Planning Areas in Central Interior British Columbia - Sustainable Forest Management Plan - Management Guidelines for Species and Plant Communities At Risk: Prince George Timber Supply Area (March 31, 2006) - CWD Best Management Practices - CWD Operators' guide to coarse woody debris retention - Ground den identification guide Dec-05	FSJ – I10	Sites of Biological Significance will be managed through the application of the following: - Adherence to FSP results and strategies where applicable - Adherence to FRPA and associated regulations - Following applicable Canfor Houston operational controls - Following best management practices (i.e snags, overstory trees, CWD) - No harvesting through avoidance and/or incorporation into retention areas (i.e ecological reserves, avalanche chutes, mineral licks, denning sites)

* Not listed in the *Field Guide to Species at Risk in Canfor's Planning Areas in Central Interior British Columbia* but listed in the Conservation Data Center (CDC) as either blue or red listed.

Appendix 4: Fine Filter Species and Sites of Biological Significance Training

SPECIES AT RISK and SITES OF BIOLOGICAL SIGNIFICANCE TRAINING

Canadian Forest Products Ltd.

Forest Management Group – East

2010

Species at Risk Act (SARA)

- **What is it?**
  - The purpose of SARA is to prevent wildlife species in Canada from disappearing, to provide for the recovery of wildlife species that are extirpated (no longer exist in the wild in Canada), endangered, or threatened as a result of human activity, and to manage species of special concern to prevent them from becoming endangered or threatened.
  - The adoption of the *Species at Risk Act* in 2002 completed the National Strategy for the Protection of Species at Risk. Two other components preceded this Act: the Accord for the Protection of Species at Risk signed in 1996, and the Habitat Stewardship Program established in 2000.

Why is it important to Canfor?

- **Legislation: Federal**
  - **Species at Risk Act (SARA)**
    - Applies directly to Federal land and migratory birds at risk
    - Protects Residence and Critical Habitat
    - Safety Net
    - Due Diligence
  - **Migratory Bird Convention Act**
    - Migratory Birds Regulation Section 6a
      - *No person shall (a) **disturb, destroy** or take a nest, egg, nest shelter, eider duck shelter or duck box of **a migratory bird**.*

Why is it important to Canfor?

Legislation: Provincial

- Parks and Protected Areas Act
- Land Act
  - Old Growth Management Areas and Wildlife Tree Patch Targets
- Wildlife Act (amendment pending to apply SAR management to other industries)
- Forest and Range Practices Act
  - WTP/CWD defaults
  - Ungulate Winter Range
  - Category of Species at Risk: Identified Wildlife Management Strategy
  - Wildlife Habitat Features
  - Regionally Important Wildlife

Why is it important to Canfor?

Certification

- CAN/CSA-Z809-02

  Element 1.2: *Conserve species diversity by ensuring that habitats for the native species found on the DFA are maintained through time.*

- Canfor's Management Guidelines meets or exceeds the requirements of CSA

Species at Risk Overview

- What is a Species at Risk? (Legal)
  - Schedule 1 Species at Risk Act (SARA) species (Federal)
    - http://www.sararegistry.gc.ca/species/schedules_e.cfm?id=1
  - Species on the Category of Species at Risk List under FRPA ((s.11(1) GAR)
    - http://www.env.gov.bc.ca/wld/frpa/species.html
  - Species listed as Endangered or Threatened under s. 13 of Designation and Exemption Reg (168/90) of the *Wildlife Act*
    - http://www.bclaws.ca/EPLibraries/bclaws_new/document/LOC/freeside/-- W --/Wildlife Act RSBC 1996 c. 488/05_Regulations/13_168_90.xml
    - Sea otter (T), American white pelican (E), Vancouver Island marmot (E), burrowing owl (E)

Species at Risk Overview

- BC Conservation Data Center (CDC) ranks species and ecological communities in BC.
- Provincial Red and Blue lists (mostly Not legal)
  - Red List:
    - ❖ indigenous species, subspecies and natural plant communities that are extirpated, endangered or threatened in British Columbia
    - ❖ species and sub-species that have, or are candidates for, official Extirpated, Endangered or Threatened Status in BC. (legal list)
  - Blue List:
    - ❖ indigenous species, subspecies and natural plant communities of special concern (formerly vulnerable) in BC.

Species at Risk: ANIMALS

CANFOR CORPORATION

Current Status

- PGTSA
  - 8 red-listed animals
  - 32 blue-listed animals

Legal Species at Risk

- SARA Schedule 1
  - Woodland caribou
  - Grizzly bear
  - Wolverine
  - Short-eared owl
  - Long-billed curlew
  - Western toad

- Category of Species at Risk (Jun 06)
  - Great blue heron
  - Sandhill crane
  - Sharp-tailed grouse
  - Bull trout
  - Bighorn sheep
  - Fisher

Species Likely NOT to be Encountered

- Invertebrates
  - Beaverpond baskettail
  - Quebec emerald
  - Mead's sulphur
- Birds
  - American white pelican
  - American bittern
  - Long-billed curlew
  - Short-eared owl

Species Likely NOT to be Encountered

- Birds
  - Bobolink
- Mammals
  - Common Pika
  - Bighorn Sheep

Species More Likely to be Encountered

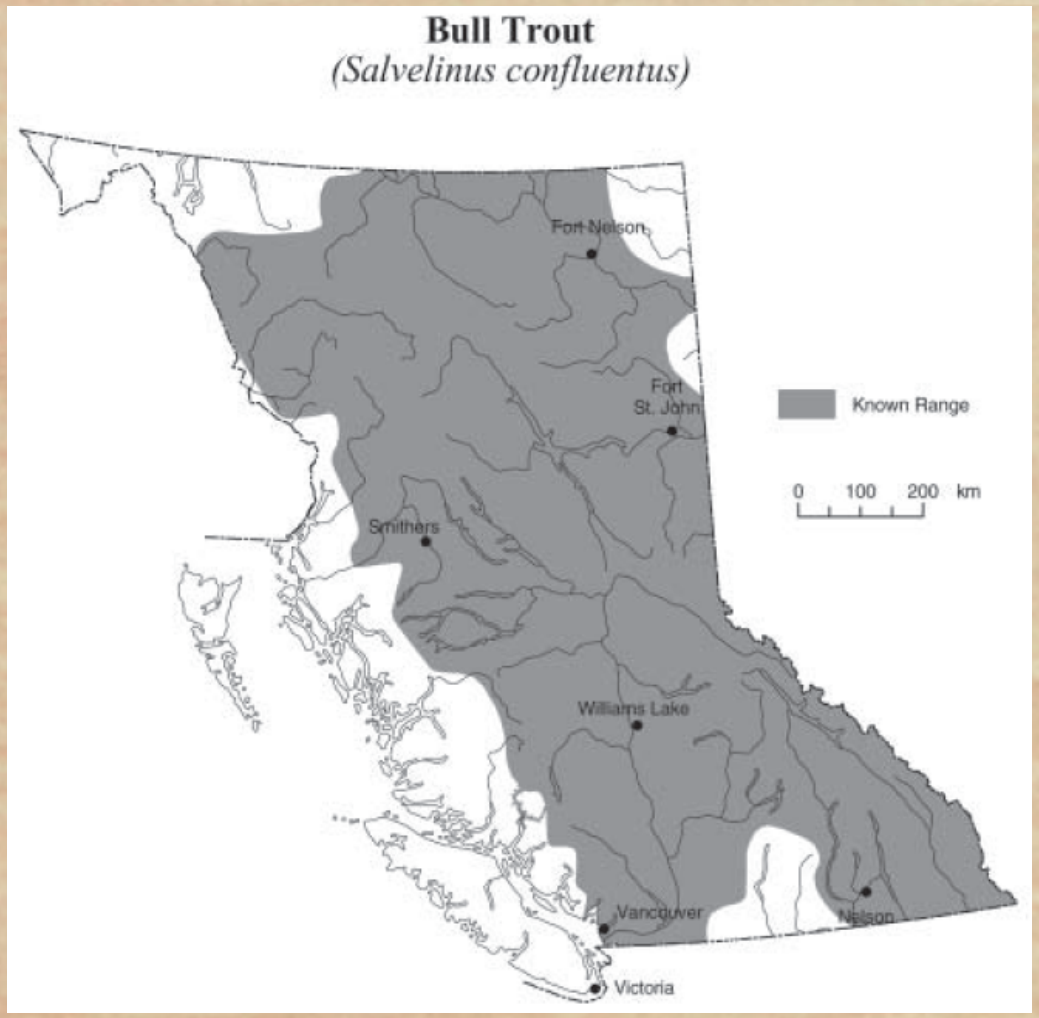
- Fish
  - Bull trout
- Amphibians
  - Western toad
- Birds
  - Great blue heron
  - Sandhill crane
  - Broad-winged hawk
  - "Columbian" sharp-tailed grouse
- Mammals
  - Northern long-eared bat
  - Townsend's Big-eared Bat
  - Fisher
  - Wolverine
  - Grizzly bear
  - Woodland Caribou

Species Identification

Bull Trout

- Listing:
  - COSEWIC: Not Assessed
  - CDC: Blue-listed
- Description:
  - Large head and jaws in relation to their long, slender bodies
- Description:
  - Colouration varies from green to greyish-blue, with lake resident fish often displaying silvery sides
  - The dorsum and flanks are spotted with pale yellowish-orange spots.

Bull Trout: Range



CANFOR CORPORATION

Bull Trout: Habitat

- Optimal water temperature: ≤ 12-13°C
- Instream and overstream cover objects for creation of sheltered pools (ie. thermally buffered and security/hiding cover)
  - ➢ These include cutbanks, logjams, or other large woody debris, and overhanging trees and shrubs
- Large deep stream/river pools and lake for shelter
- Stable channel and flows
- Spawn in smaller, slow moving streams/rivers with proximity to cover (cutbanks, overhanging bush); small gravel (<20mm) and cobbles where water temperatures rarely reach 9 °C. Usually close to pools

Bull Trout: Habitat

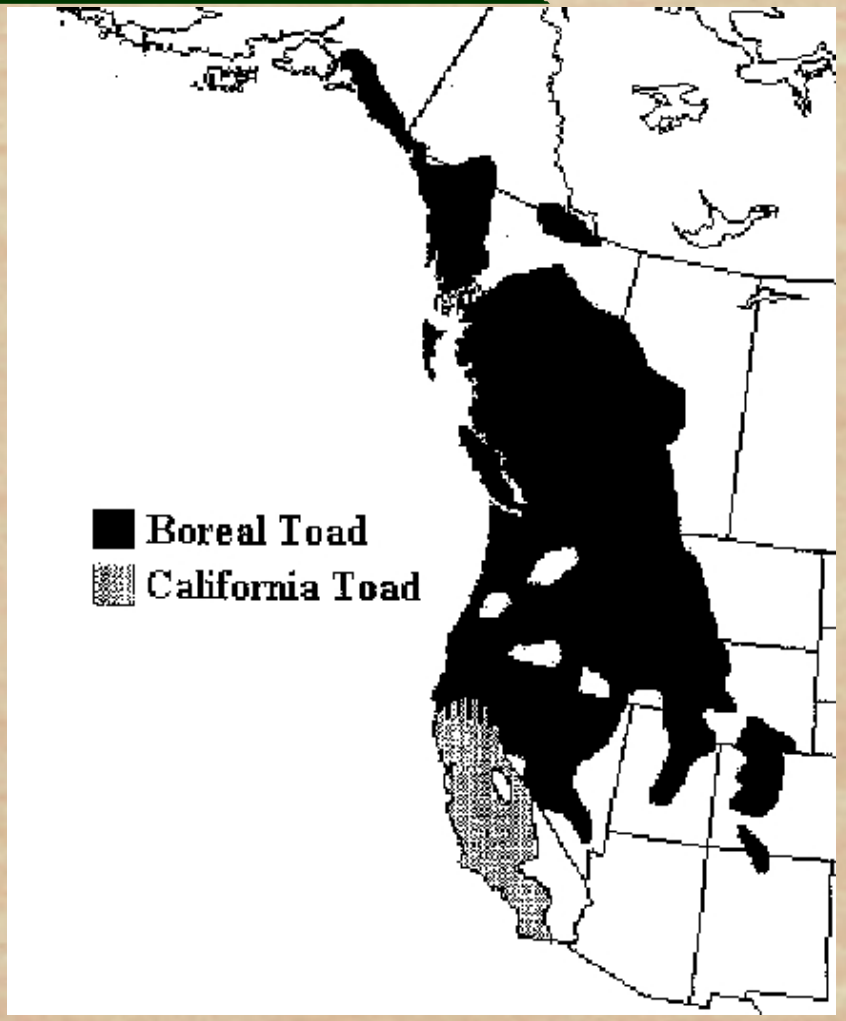
- Migration: both resident and migratory populations
  - Residents, by definition, typically migrate only short distances for spawning, rearing and over-wintering habitats
  - Migratory adults travel extensive distances (up to 250 km) to their spawning grounds

Western Toad (Boreal subspecies)

- Listing:
  - COSEWIC: Special Concern (2002)
  - CDC: Yellow List
- BC's largest toad
- Color: varies from reddish-brown to grey to olive-green
- Body: dry, bumpy with conspicuous oval-shaped glands, horizontal pupils and cream-coloured or white dorsal stripe
  - Adults range from 5.5 to 12.5 cm

Western Toad: Range

- Range: Found throughout most of BC mainly in boreal forest, subalpine and alpine environments (elevations up to 2,300 m)



Western Toad: Habitat

- Habitat:
  - Breeding: permanent or temporary water bodies with shallow sandy bottoms (April to June)
  - Summer: after breeding dispersal into forests and grasslands
    - ❖Often travel far from water source (400-600 m; up to 7.2 km)
    - ❖Ranges are distinct: usually three to seven hectares in size
  - Winter: underground - burrows beneath fallen logs into loose soils (up to 1.3m) or within rock crevices (November to April)

Great Blue Heron

- Districts: PG, FSJ(?)
- Listing:
  - COSEWIC: Not Assessed
  - CDC: Blue-listed
- Largest wading bird in North America – 105-130 cm tall
- Color: grayish-blue
- Wings: long and rounded
- Bill: Long; Tail: short
- Flight: necks folded into an ‘S’

Great Blue Heron: Range

CANFOR CORPORATION

Great Blue Heron

- Breeding Season – initiates in late March
- Some colonies are dynamic – can move around
- Nests <8 km from feeding sites

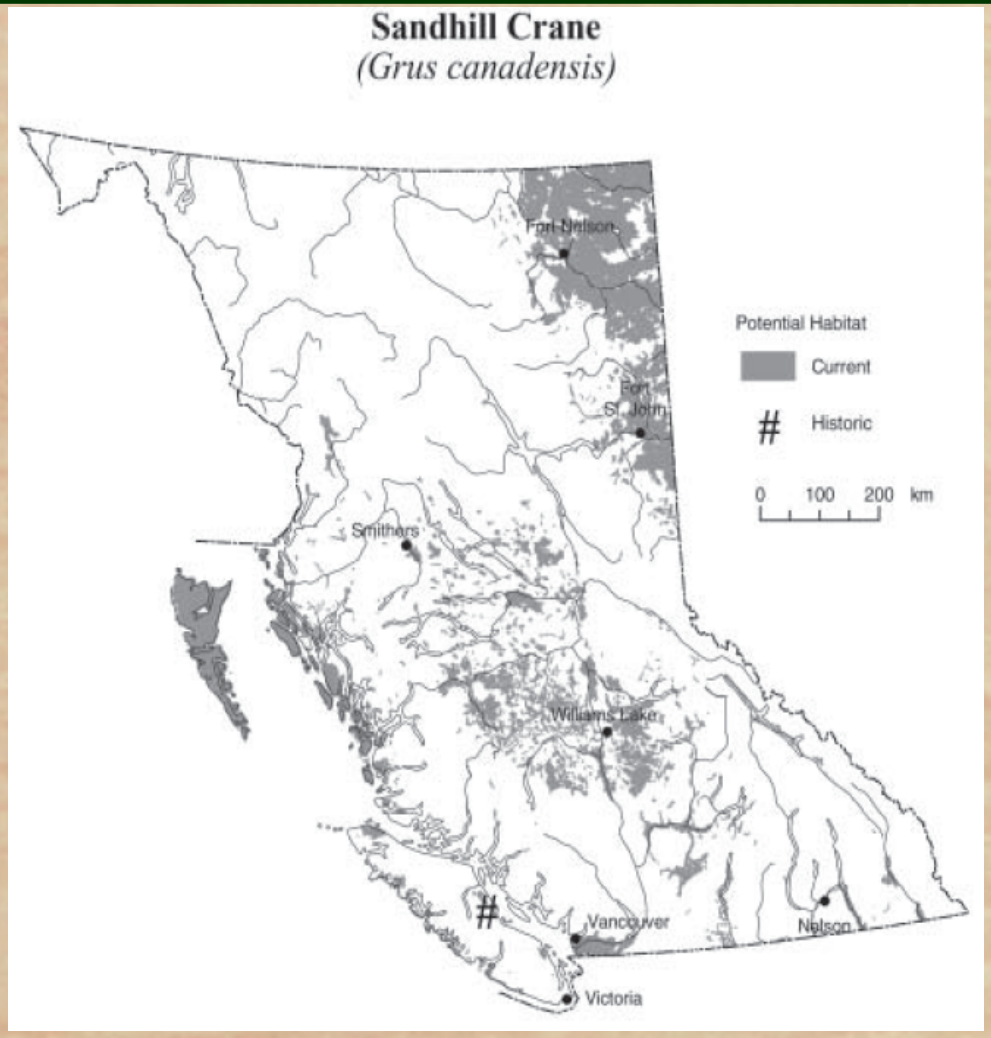
Great Blue Heron

- Nests in Colonies
  - ➢ Multiple nest per tree or multiple trees with single nest
- Nests are generally close together.
- May nest in contiguous forest, fragmented forest or solitary trees
- Most nests in the Interior are in cottonwood, but will use Douglas-fir, white pine, and white/Engelmann spruce

Sandhill Crane

- Districts: PG, FSJ
- Listing:
  - COSEWIC: Not At Risk
  - CDC: Blue-listed
- ~100 cm tall
- Color:
  - A: gray with bare red forehead
  - J: brownish w/o red forehead
- Feather tuff over tail

Sandhill Crane: Range



Sandhill Crane

- Flight: necks extended, quick wing strokes
- Eggs: April 15-June 25
- Nests:
  - ground (8%) or water on thick shrubs or emergent vegetation (isolated wetlands >1ha with forest cover for escape)
  - 1-3 eggs

Photo: A. Deans

Broad-winged Hawk

- Districts: PG (2002); FSJ?
- Range expanding
- Listing:
  - COSEWIC: Not At Risk
  - CDC: Blue-listed
- Small, stocky forest dwelling hawk
- Size:
  - 34-44 cm (crow size)

Broad-winged Hawk

- Description
  - Broad white and black tail bands
  - Wings broad, pale and with a prominent dark band along trailing edge
  - Breast is reddish with cinnamon or chestnut barring along flanks
  - Brown back and dark face

Broad-winged Hawk

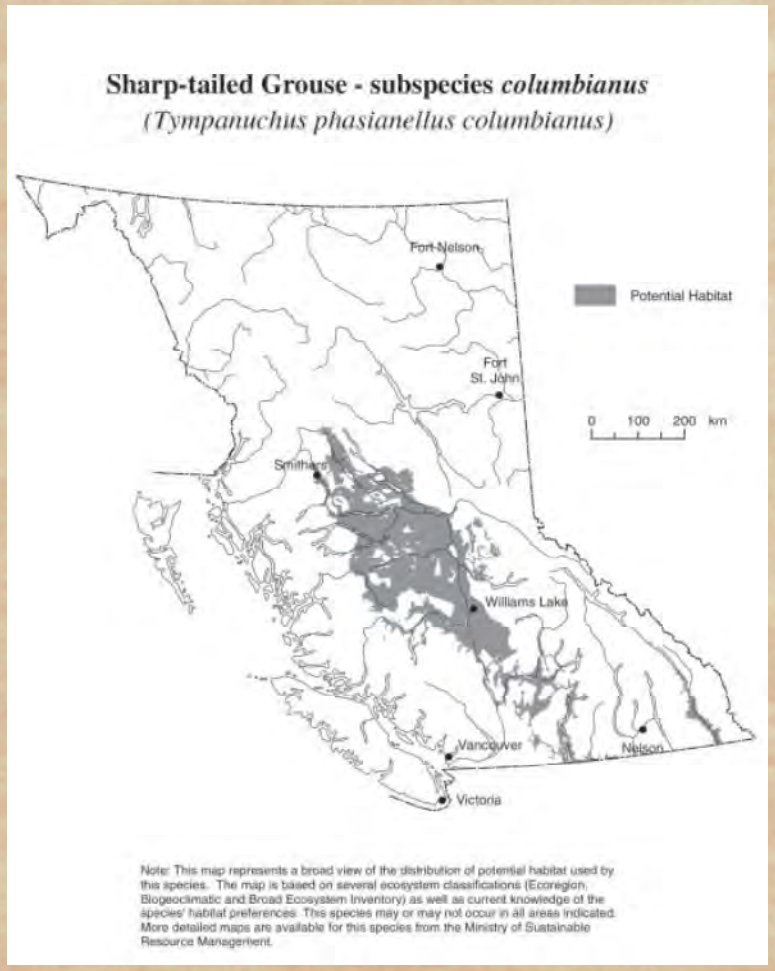
- Habitat
  - Deciduous/mixed wood
- Nests
  - Quite small (30 cm), poorly built, often decorated
  - Located in main crotch or on branch adjacent to tree trunk
  - Trees: Conifer or Deciduous

Sharp-tailed Grouse

- Districts: DPG, DVA
- Listing:
  - COSEWIC: Not Assessed
  - CDC: Blue-listed (*columbianus* ssp)
- Size:
  - 41-47 cm
  - 595 – 1,031 g (just over 2.2 pounds)

Source: Photo CD 6029 1621 1721, Image # 042

Sharp-tailed Grouse: Range



Sharp-tailed Grouse

- Description
  - Short crest
  - Elongated tail feathers with white edges
  - Male has purple air sac exposed on neck during breeding display
  - Cryptic coloration with “v”-shaped markings

Sharp-tailed Grouse

- Habitat:
  - ➢Relatively dense herbaceous cover and shrubs
  - ➢Leks in meadows, recent burns, clearcuts, natural openings, or other areas with low, sparse vegetation
  - ➢Winter in riparian areas, roadsides, hedgerows, or other areas supporting deciduous trees and shrubs

Source: Photo CD 6029 1621 1721, Image # 042

Sharp-tailed Grouse

- Nests:
  - Avg 10-12 eggs
  - ground nest under or near shrubs or trees
  - Made of moss, grass, herbaceous plants, leaves, and feathers

Northern Long-eared Bat

- Districts: PG, FSJ
- Listing:
  - COSEWIC: Not Assessed
  - CDC: Blue-listed
- Size:
  - Medium sized bat
  - 8-10 cm
  - Wingspan: 24cm
  - 5-10 g

Northern Long-eared Bat

- Color: dark brown on upper parts, lighter belly fur
- Ears: extends past the nose by >3mm and are pointed
- Has been captured in the SBS subzones of PG, likely in the ICH as well.
- Maternal sites: Cracks in cottonwood
- Hibernacula: Large hollow trees and caves/mines

Northern Long-eared Bat

Known maternal site

Photo: J. Psyllakis

Potential day roost

Photo: J. Psyllakis

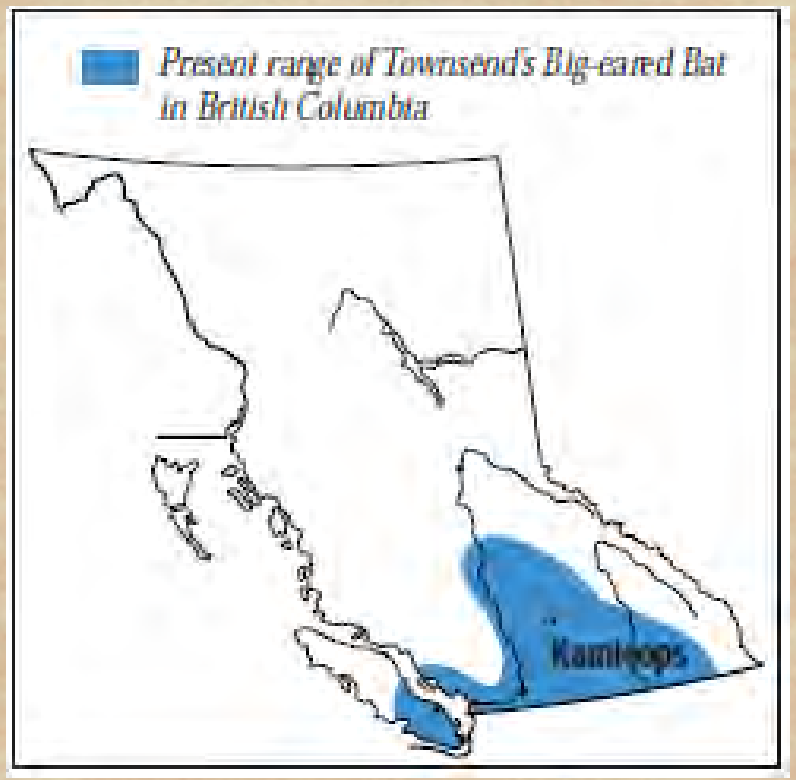
CANFOR CORPORATION

Townsend's Big-eared Bat

- District: Quesnel
- Listing:
  - COSEWIC: Not Assessed
  - CDC: Blue-listed
- Size:
  - Medium sized bat
  - 10 cm
  - Wingspan: 29cm
  - 9 g
  - Color: Long dorsal fur varies from pale brown to blackish-grey; underfur is paler

Townsend's Big-eared Bat

- Ears: 3-4 cm long (about one half of the body length!)
- Two prominent glandular swellings on its nose.
- In the interior, most records of this bat are from the Okanagan, Shuswap, Kamloops, Williams Lake and Kootenay areas. Bunchgrass, Ponderosa Pine and Interior Douglas Fir zones
- Maternal sites: usually at hibernation sites
- Hibernacula: caves, old mines and buildings

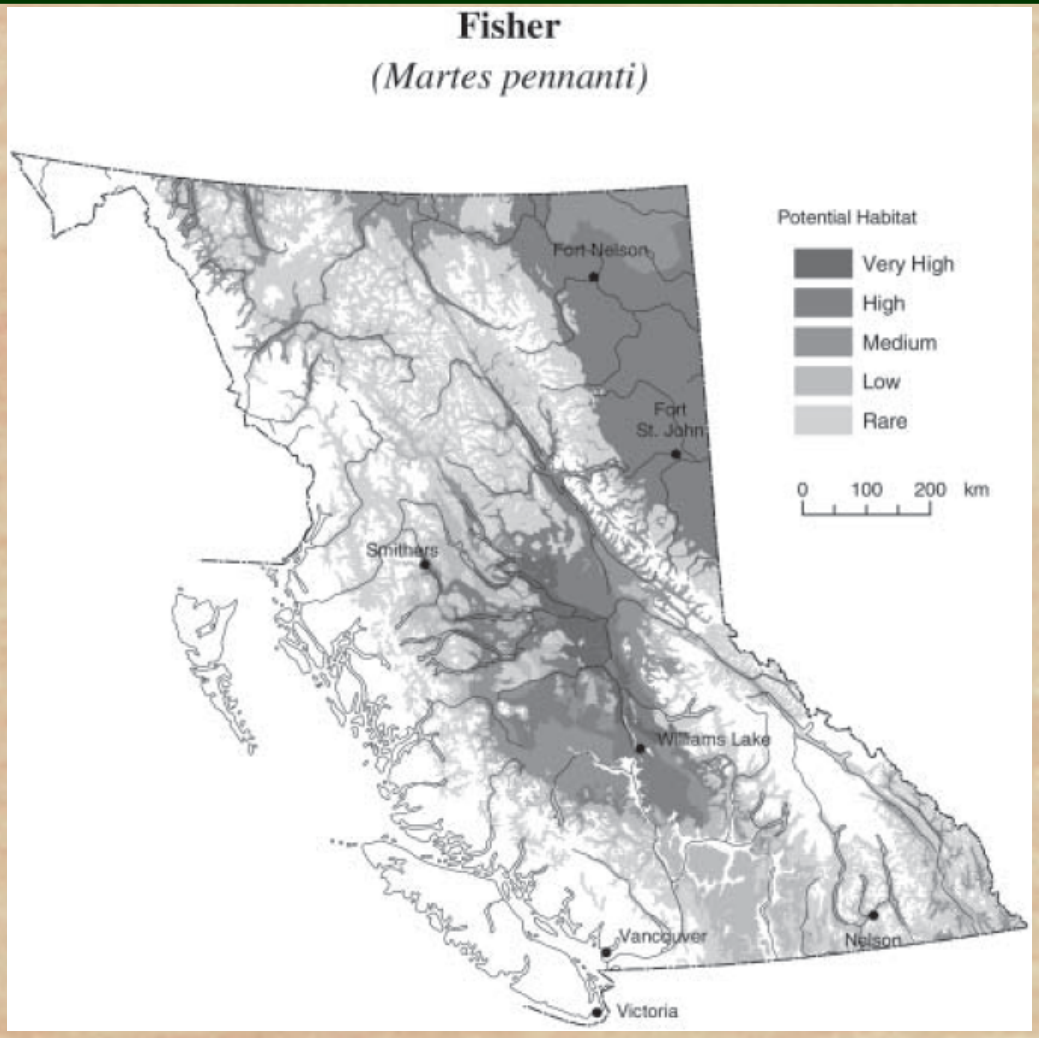


Fisher

- Districts: PG, FSJ
- Listing:
  - COSEWIC : Not Assessed
  - CDC: Blue-listed
- Size:
  - *Head and Body*: 51-63 cm
  - *Tail*: 33-39 cm
  - *Weight*: Male – 2.7-5.4 kg; Female – 1.4-3.2 kg

Photo: G. Proulx

Fisher: Range



Fisher

- Color: dark brown to black
- Habitat:
  - Mosaic of young and mature interspersed with early seral
  - Late successional forest: >30% canopy closure and >20m^2/ha
  - Habitat feature: ≥28cm CWD, witches broom, >50 cm snags, >80cm deciduous for denning
- Similar spp: marten, mink

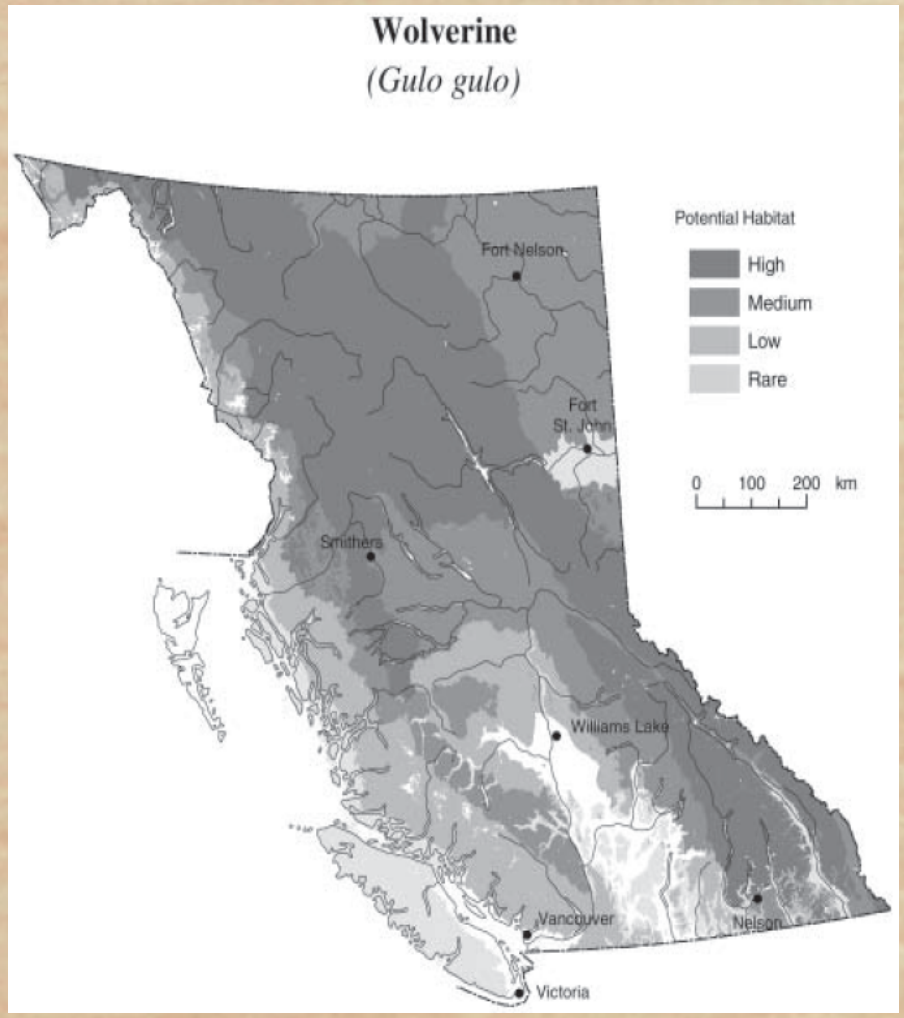
Photo: G. Proulx

Marten

Wolverine

- Districts: PG, FSJ
- Listing:
  - COSEWIC: Special Concern
  - CDC: Blue-listed
- Size:
  - Largest in weasel family
  - *Head and Body*: 65-107 cm
  - *Tail*: 17-26 cm
  - *Weight*: Male – 11-16 kg; Female – 6.5-15 kg

Wolverine: Range



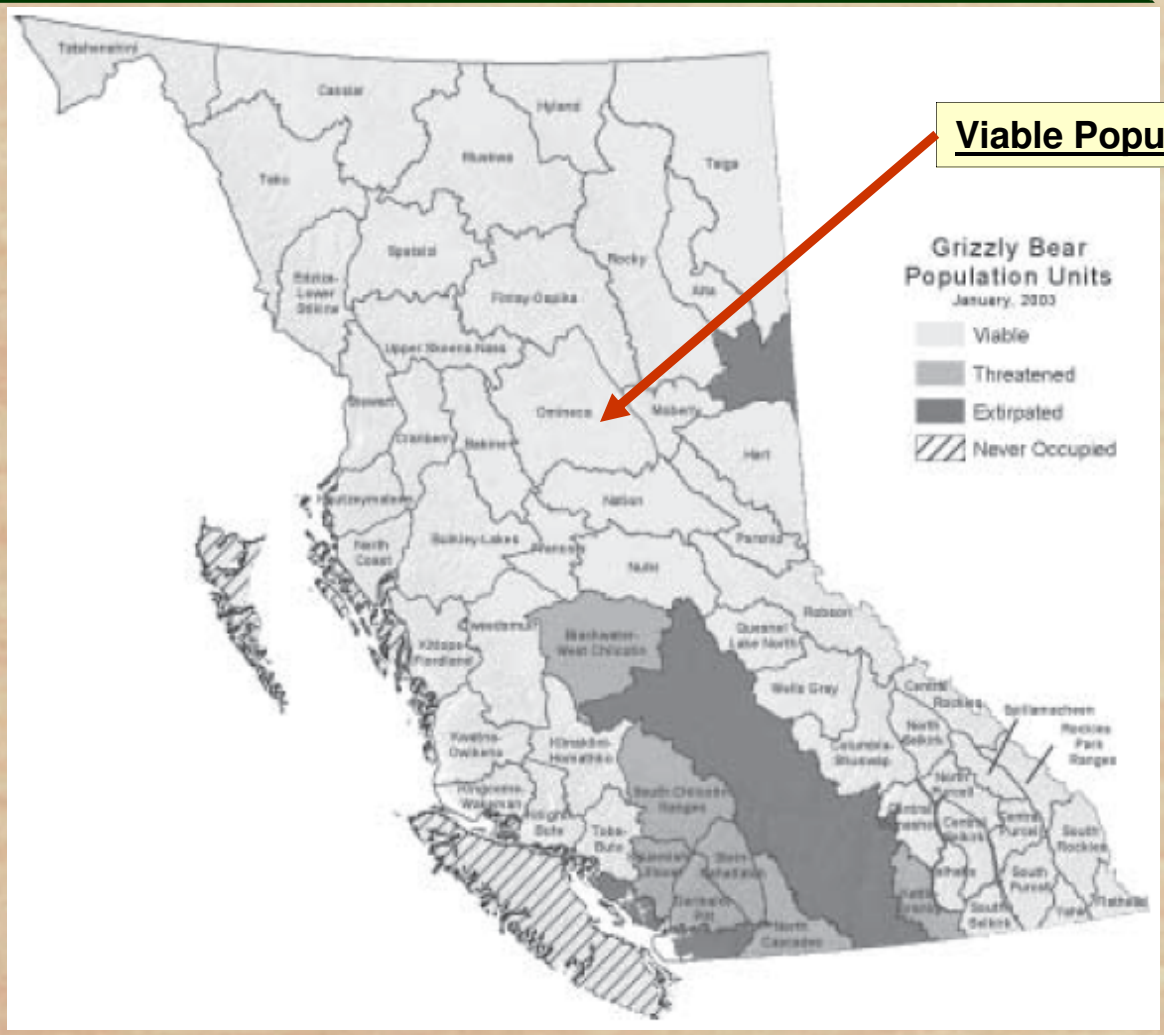
Wolverine

- Color:
  - dark brown with light facial mask and throat patch
  - 2 yellowish stripes from shoulder to the rump
- Home Range: males 135K ha
- Habitat:
  - Valley bottom to alpine meadows
  - Dens: Blowdowns, large cwd, large boulders and rock outcrops
  - Females: generally alpine and high elevation older coniferous forest in summer
  - Males: lower elevation

Grizzly Bear

- Districts: PG, FSJ
- Listing:
  - COSEWIC: Special Concern
  - CDC: Blue-listed
- Size:
  - *Weight*: Male – 250-350 kg; Female – 100-175 kg
- Description:
  - Prominent shoulder hump

Grizzly Bear: Range



Grizzly Bear

- Description:
  - Massive head
  - Upturned muzzle
  - Short round ears
  - Shaggy coat
  - Very long claws
- Color:
  - Pale yellowish brown, to dark brown
  - Silvery white tips on hairs

Photo: G. Proulx

Grizzly Bear: Habitat

- Denning Habitat: Typically 2,100-2,300 m in elevation; steep slopes ranging from 30% to 80%; dominantly north- and east-facing aspects
- Late spring/early summer: wet streamsides in mature spruce forest, gully bottoms, groundwater
- Mid-summer: toes of avalanche slopes, moist east- and north-facing slopes near tree line, moist gully bottoms, regenerating burns and clear-cuts are favoured as these sites
- Late July / early August: berry feeding under open canopies, well-drained and early succession forests and low shrublands

Grizzly Bear

- Similar Species: Black Bear
  - No hump
  - Straight facial profile
  - Dog-like nose muzzle
  - No face ruff
  - Smooth coat
  - Short claws

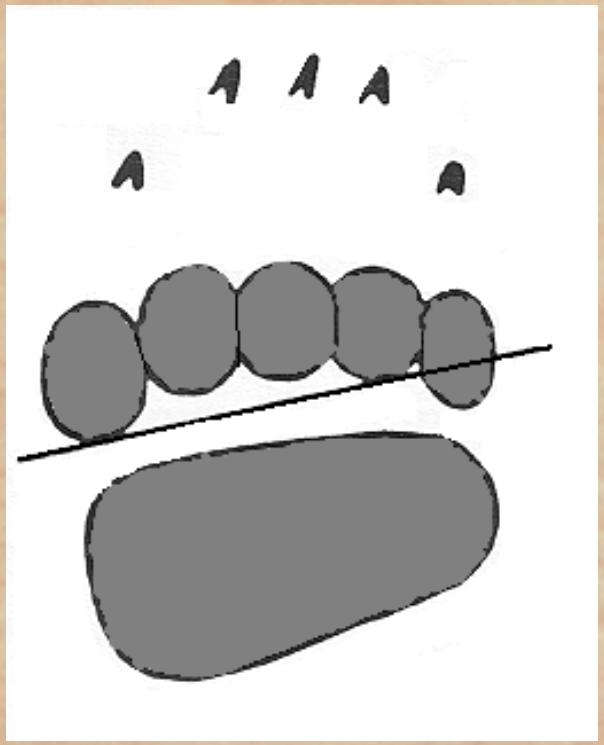
Tracks: Griz vs Black bears

Grizzly

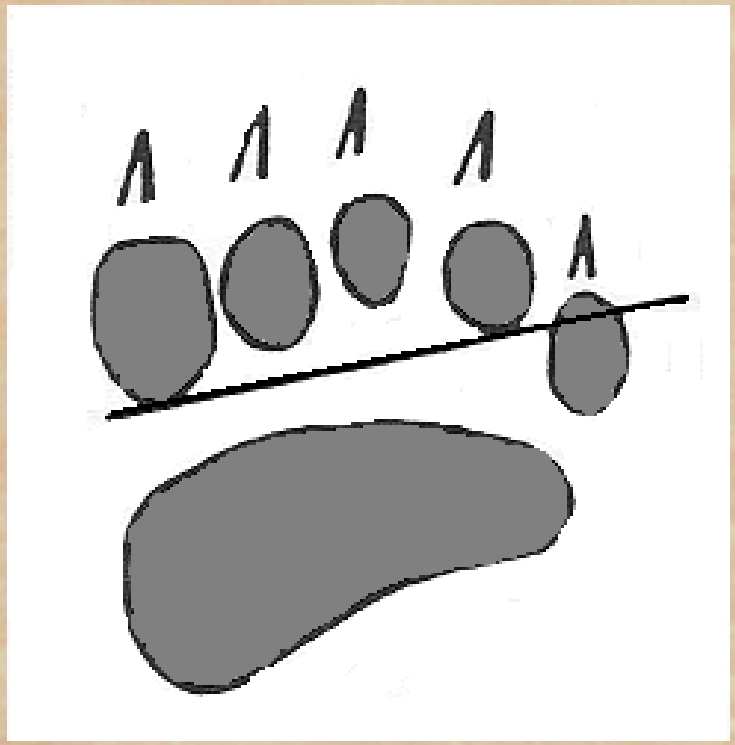
Front pad: can be >15cm

Claws are difficult to see and well ahead of toe marks

Toes are more aligned and toe imprint joined



Black



Front pad: <13cm

Claws are sharply incised and close to toe marks

Toes arched more and toe imprint separate

Woodland Caribou: Southern Mountain National Ecological Area

- Districts: PG, FSJ
- Listing:
  - COSEWIC: Threatened
  - 2 ecotypes: Mountain (PG); Northern (FSJ)
  - CDC: Mountain: Red-listed; Northern: Blue-listed.
- Size:
  - Medium sized ungulate
  - Males: 112-275 kg; females 67-158 kg

Caribou: Southern Mountain NEA

- Description:
  - Long legs
  - Broad blunt muzzle
  - Both sexes have antlers
  - Male antlers are “C” shaped, with vertical palmated brow tines
- Color:
  - Chocolate-brown in summer to light-gray in winter
  - Neck, rump and underside of short tail is lightly colored

Caribou: Southern Mountain NEA

- Habitat (Mountain ecotype):
  - Early winter: ICH/SBS, mid ESSF
  - Late Winter: open stands – ESSF parkland
  - Spring: exposed sites ESSF, AT, ICH/SBS
  - Summer: Upper ESSF and AT

Caribou: Southern Mountain NEA

- Habitat (Northern ecotype):
  - Early winter: low elevation pine
  - Winter: high elevation, wind swept slopes
  - Spring: AT, ESSF
  - Summer: AT, ESSF

An animal species is identified

- What should YOU do?

Document sighting by taking a photo or writing a detailed description.

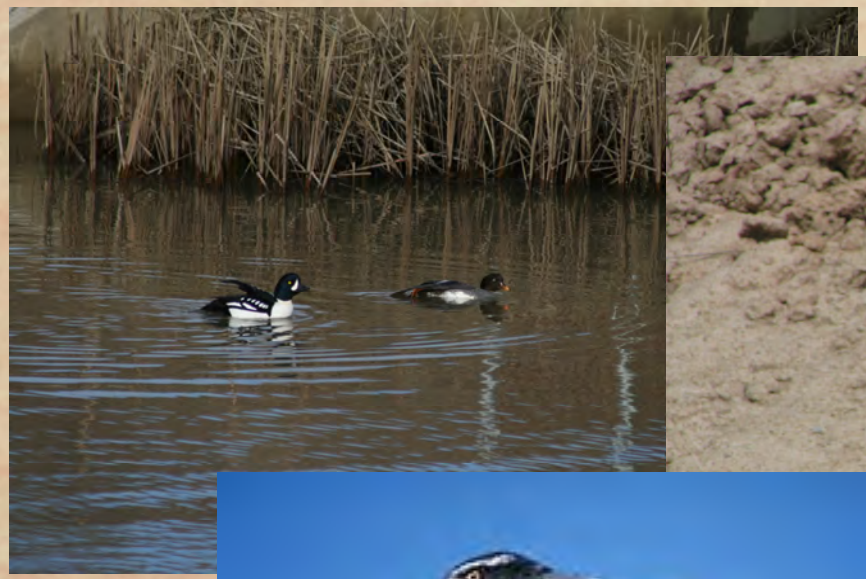
Document location by taking a GPS point or noting the location on a map.

Confirm sighting using Canfor field guide or training supplement.

Complete field card.

Notify Permitting Forestry Supervisor responsible for the block.

Regionally Important Wildlife



Regionally Important Wildlife

•GAR s. 13(2): The minister responsible for the *Wildlife Act* by order may establish one more categories identifying species of wildlife as regionally important wildlife if satisfied that the species:

a) are important to a region of British Columbia

b) rely on habitat that requires special management that is not otherwise provided for in this regulation or another enactment, and

c) may be adversely impacted by forest practices or range practices.

Regionally Important Wildlife

- Criteria for new list currently being developed
- Intent will be to capture "special" yellow-listed species

Sites of Biological Significance

Wildlife Habitat Features

- Government Actions Regulation Section 11(1):
  - a fisheries sensitive feature;
  - a marine sensitive feature;
  - a significant mineral lick or wallow;
  - a nest of (i) a bald eagle (ii) an osprey (iii) a great blue heron (iv) a category of species at risk that is limited to birds;
  - any other localized feature that the minister responsible for the *Wildlife Act* considers to be a wildlife habitat feature
- Forest Planning and Practices Regulation 70(2): "*An authorized person who carries out a primary forest activity must ensure that the primary forest activity does not damage or render ineffective a wildlife habitat feature*"

Wildlife Habitat Features

- WHFs not determined yet
- Linked to residence for Species at Risk
- Possibilities:
  - Mineral licks
  - Grizzly bear ground dens
  - Northern long-eared myotis hibernacula and maternity roosts
  - Hot springs associated with species at risk

Mineral Licks

- Natural salt deposits
- Base of hills or bluffs bordering streams
- Wet licks and dry licks
- Wet Licks: Typically Deer, Elk and Moose (Pelican)
- Dry Licks: Typically Mountain Goats and Sheep
- Goats will dig out under tree roots. Spring: peak use - Get minerals and clay for binding.

Photo: G. Proulx

Photo: J. Deal

CANFOR CORPORATION

Bald Eagle Nests

- Interwoven sticks filled with grass, moss, fine woody material, and feathers
- 20-60 m above ground, usually in top ¼ of tree, just below crown
- Nest used for many years, even decades
- Avg. 1.5-1.8 m diameter, and 0.7 – 1.2 m tall
- Largest may weigh up to 2 metric tons!

Osprey Nests

- Uses a wide variety of strata including trees, utility poles, and platforms
- Interwoven sticks with finer materials, such as bark, grass, sometimes paper/plastic bags
- Nest re-used year after year
- Platform nests often smaller than tree or ground nests, but nests up to 1-2 m diameter and 3-4 m deep

Dens

- Hole in the ground, a cave, hollow tree or log
- Grizzly Bear: found on North to East aspects, high elevation, 30-80% slopes
- Black Bear: Under root cavities or blowdown where natural cover or in hillside. Aeolian (wind-deposited) soils. Possible tree dens in Cw or Act
- See Canfor Den ID Guide

Photo: V Banci

Special Habitat Features

Special Habitat Features: Large Stick Nests

Photo: F. Doyle

Special Habitat Features

Avalanche Track

Photo: G. Proulx

Witch's Broom

Photo: G. Proulx

Special Habitat Features

Snag with nest cavity

Photo: G. Proulx

Coarse Woody Debris

Photo: G. Proulx

Special Wildlife Habitat Features: Management Recommendations

- Interim Strategy until WHFs are legally established
  - ➢ Anchor WTPs on a feature, if possible due to layout and safety constraints
- Special Habitat Features
  - ➢ Anchor WTPs on a feature, if possible due to layout and safety constraints

A Site of Biological Significance is identified

- What should YOU do?

If the site is a large stick nest, mineral lick, rock feature, large den or avalanche track attempt to exclude it from harvest area providing a wind firm buffer around the feature.

Document location by taking a GPS point or noting the location on a map.

Complete field card.

Notify Permitting Forestry Supervisor responsible for the block.

Species at Risk: PLANTS

Current Status

- COSEWIC ranked plants
  - 187 in Canada
  - 55 in BC
- BC CDC ranked plants
  - 295 red-listed provincially
  - 335 blue-listed provincially

Current Status

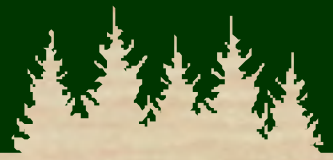
- PGTSA
  - 5 red-listed plants
  - 33 blue-listed
  - 1 COSEWIC Special Concern (Cryptic Paw)
- 2 “documented” locations of red-listed plants in PGTSA
    - reported to CDC in 1954
    - Not in Canfor’s operating area

BC Conservation Data Centre

- BC authority on Species At Risk
- Collect and distribute information
  - Element occurrence maps
- Assign conservation ranks
- Maintain BC red and blue lists

- http://www.env.gov.bc.ca/cdc

Red-Listed Vascular Plants



- Dark Lamb's-Quarters
- Rivergrass
- Fernald's False Manna
- Riverbank Anemone
- Sprengels Sedge

Dark Lamb's-Quarters

- Weedy looking species in SBSdw3
- Primarily known to occur in Fort St James District
- Dry, disturbed areas

M. Charters

Rivergrass

- Wetland / riparian areas in SBSdk
- Note ascending panicle

H. Arkkio

Fernald's False Manna

- SBSmh
- Semi-aquatic
- Bordering wetlands, occasionally in meadows and bogs
- Up to 1m tall

R. Freckmann

Riverbank Anemone

- SBSmh
- gravelly areas near streams and rivers
- Up to 1m tall
- Flowers creamy-greenish

J. Abbas

CANFOR CORPORATION

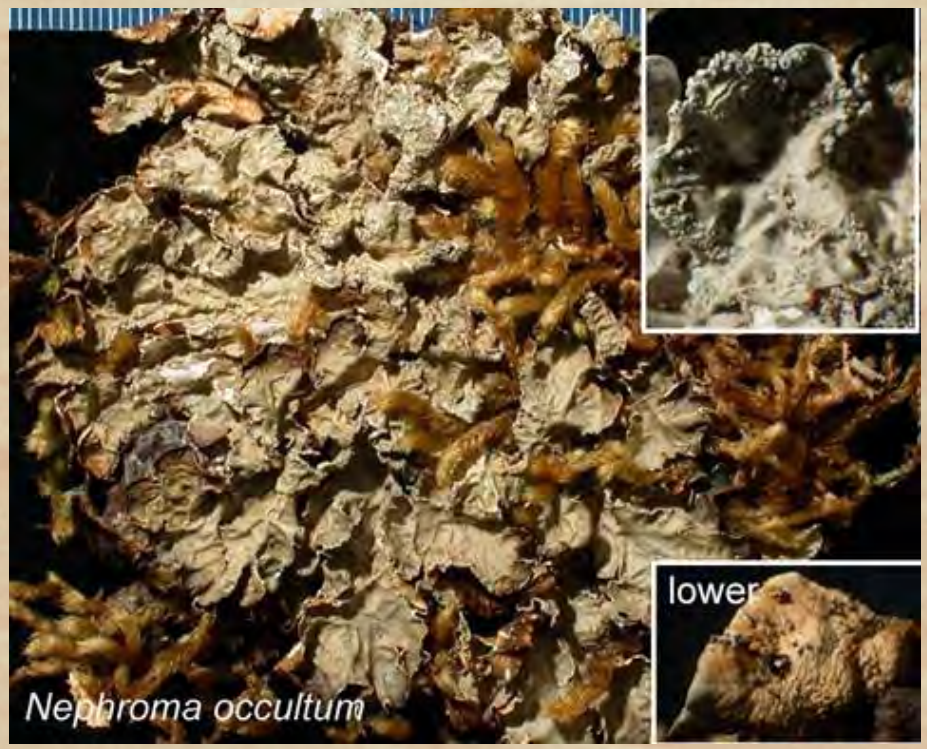
Sprengel's Sedge

- SBSmh
- Moist to wet slopes near rivers
- Forested and open areas

M. Wetter

Cryptic Paw

- Paw Lichen
- COSEWIC – Special Concern
- On trees, logs and mossy rocks
- ICH species



Oregon State U.

Other Rare Plants

- Numerous other plants at risk
- Important to be aware when working in uncommon ecosystems
  - Riparian / Wetlands
  - Rocky Outcrops
  - Open forests
  - Springs
  - Avalanche tracks
- If unsure, treat as at risk plant population

A rare Plant is identified

- What should YOU do?

Document the occurrence by taking a GPS point and photograph of the plant(s).

Is there >20 Individual plants present?

yes

Remove a full specimen including roots and reproductive structures.

no

If feasible, exclude from the harvest area or roads leaving a 30 to 50m buffer.

Notify Permitting Forestry Supervisor responsible for the block.

Species at Risk: PLANT COMMUNITIES

Current Field Guides

- Southeast PG: 2003
- Southwest PG: 1993
- Northeast PG: 1990
- North Central NIFR: 2004
- Northern Rockies: 1994
- Rocky Mtn. Trench: 1996 (draft insert)
- Cariboo: 1997
    - **Supplement 1 – ESSFxv2: 2001**
    - **Supplement 2 – SBSmw: 2002**
- Prince Rupert: 1993

Background

- Community termed at risk if:
  - **Rare**: sites capable of supporting community are uncommon
  - **Endemic**: somewhat uncommon and only found in BC
  - **Cumulative Impact**: human influence resulted in community at risk

Why Manage Plant Communities At Risk?

- Some legally designated under Identified Wildlife Management Strategies (IWMS)
- Commitments in SFM Plans
- Maintain a functioning, resilient landscape

Current Status

- COSEWIC does not currently rank plant communities
  - Likely will in near future
- IWMS
  - Temporarily stopped ranking communities in 2004
  - Resumed in 2006
- BC Conservation Data Centre
  - 159 red-listed in BC
  - 156 blue-listed in BC

Current Status - PGTSA

- 74 communities at risk
- 20 red, 54 blue-listed
    - 5 forested floodplains
    - 27 forested uplands
    - 9 forested wetlands
    - 5 non-forested floodplains
    - 4 non-forested upland
    - 23 non-forested wetlands
- 7 globally ranked G1 or G2:
    - endemic to BC

Community Descriptions

- Focus on Forested communities that will be encountered most often
- Refer to 2005 field guide for other descriptions
- Remember - Plant Communities not directly correlated to BEC units
  - Specific site and floristic composition

Forested Communities

- Be aware of unusual site conditions
  - Moderate to steep slopes / aspects
  - Rocky outcrops
  - Floodplains
  - Wetlands

Slopes / Aspects

- Moderate to steep slopes
- Crests and upper slopes often have uncommon communities
- Cool and warm aspects

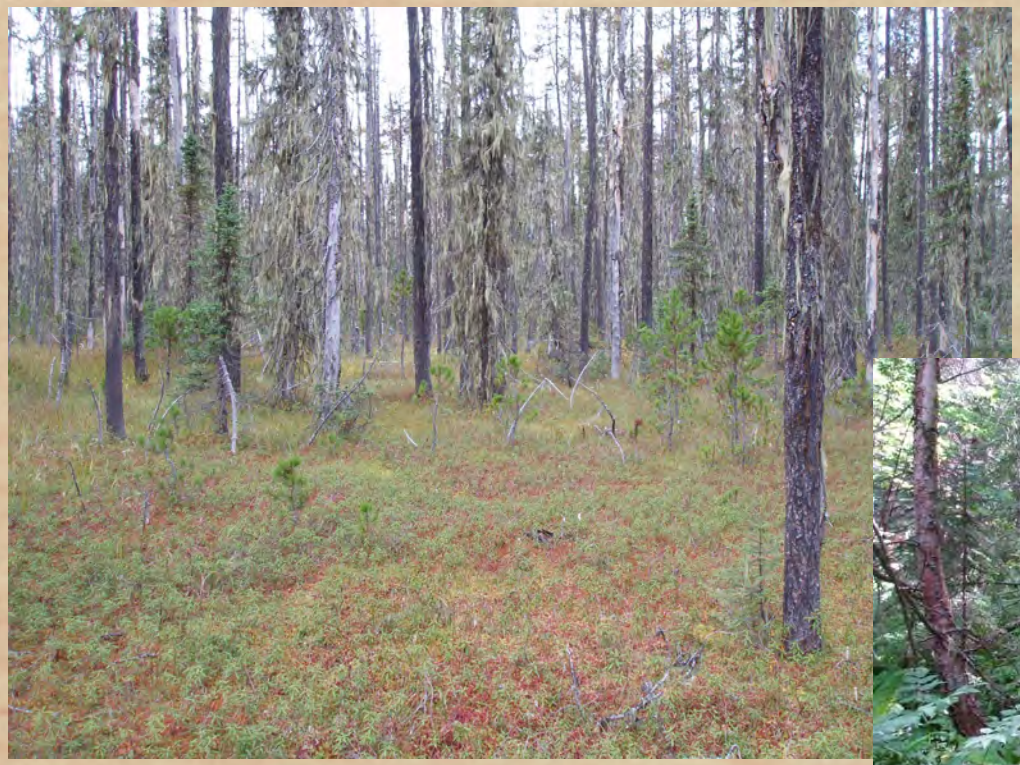
Rocky Outcrops

- Considered at risk in almost every BEC variant
- Thin soils, usually exposed bedrock or talus

Forested Floodplains

- Adjacent to large rivers and streams
- Subjected to regular flooding events
- Usually have coarse soils, but sites are imperfectly to poorly drained

Forested Wetlands



CANFOR CORPORATION

The 'Common' but Uncommon Communities

- FdSxw / electrified cat's-tail moss (SBSdw2)
- FdSxw / Knight's plume (SBSmk1, wk1, mw)
- FdSxw / thimbleberry (SBSdw1, mh, vk, wk3, wk3a)
- Pl / black huckleberry / velvet-leaved blueberry (SBSmw, wk1, vk)
- PlSb / feathermoss (SBSdw2, dw3)
- Sxw – Hardhack (SBSmw, wk1, dw3)

FdSxw / Electrified Cat's-tail Moss

- Found on moderate to steep north aspects in SBSdw2
- Very poor shrub and herb layers – continuous moss layer
- Should have Fd dominant or co-dominant in canopy

Fd-Sxw / Knight's Plume

- **Steep, warm aspects in: SBSmk1, mw, wk1**
- **Fd usually dominant, can be co-dominant**
- **Douglas maple usually present**

Fd - Sxw / Thimbleberry

- Fd in canopy, usually dominant component
- Warm aspects in SBSdw1, mh, vk, wk3, and wk3a
- Douglas maple and thimbleberry dominate

Pl / Black Huckleberry – Velvet-leaved Blueberry

- Found on coarse-textured terraces
- Extensive adjacent to Bowron, Willow, Fraser, Parsnip
- Dry / poor vegetation, dominated by velvet-leaved blueberry
- SBSvk/02, SBSwk1/03, SBSmw/03

Pl-Sb / Red-stemmed Feathermoss

- Classic poor type in the SBSdw2/07 and SBSdw3/05
- Always has Sb regeneration, usually dominant in canopy
- Poorly developed shrub and herb layer

Sxw / Hardhack

- Typical hardhack (pink spirea) type
- Almost always on lacustrine or fine textured fluvial
- Usually PlSxw canopy, hardhack dominates
- SBSmw/05, SBSdw3/06, SBSwk1/06

‘Endangered’ Subzones

- SBSmw
  - Zonal is blue-listed
  - 02, 03, 04, 05
- SBSmh
  - All communities (except horsetail type) are blue or red-listed
  - SBSmh/08 (Sxw – ostrich fern) is IWMS community (June, 2006)

IWMS Communities

- Sxw – Ostrich Fern (SBSmh/08)

- Cw / Devil's Club / Ostrich fern (ICHvk2/05)

Management of Plant Communities at Risk

- No formal management strategies available from CDC
- IWMS strategies include:
  - Delineate entire occurrence of community
  - Complete rare plant association field card
  - No-harvest buffer equivalent to 2 tree lengths
  - Avoid disrupting hydrology within / adjacent to stand
  - Minimize spread of invasive species
  - Consider cattle fences around community

Management of Plant Communities at Risk

- Landscape level management, combined with stand-level management preferred
- Still a couple years away from complete landscape level inventory (Sensitive Ecosystems Inventory)
- Follow recommended process for stand level management
  - stand level conservation evaluation and assessment
  - similar to archeological or stream assessment

Management Guidelines – Forested Upland Sites

- Fill out Canfor SAR field card
- Conservation assessment required for all occurrences (may not require field visit if SAR card filled out)
- Condition, size and landscape context are evaluated relative to community type
- Excellent and good quality sites recommended to be placed in reserves

Observation Reports – Plant Communities

- **Submit following:**
  - SAR Field Observation Form
  - SP Eco cards
  - General/Block/Layout field maps (with site series)
  - Stereo pairs of aerial photos
  - Digital photos (if available)

Management of Plant Communities at Risk

- Not all occurrences require special management
- Depends on:
    - Community classification (matrix, large, small, linear)
    - Size (including nearby occurrences)
    - Condition (age, past disturbance, health of stand)
    - Landscape context (connectivity, fragmentation, gene flow barriers)

Element Occurrence Rank Summary Table

Attribute	Factor Weighting	Factor Rating	Score	EO Rank	Rank Value
Condition	3	3	9	B	GOOD
Size (Quality)	2	2	4	C	FAIR
Landscape Context	1	1	1	D	POOR
Conservation Value	**N/A**	**N/A**	**2.22**	**C**	**FAIR**

A rare Plant Community is identified

- What should YOU do?

Complete the SAR Conservation Decision Key

Document location and map the extent of the occurrence. Include photographs.

* If feasible, exclude the area from the harvest area providing a wind firm buffer.

Notify Permitting Forestry Supervisor responsible for the block.

* Note: for forested floodplain plant communities provide a 100m buffer; for forested upland communities provide a 25m buffer; for forested wetland communities provide a 50m buffer.

SAR SWP

CANFOR

FMG East - Standard Work Procedure

Species at Risk and Sites of Biological Importance Program

Purpose or Intended Results	Needed Information or Items		Responsibility
- **To provide training for field staff on SAR**	- SAR Field guide	- Completed field card	**All**
- **To provide clear instructions when SAR is observed**	- Site/Species description	- Clear SAR Mgmt Strategy	
- **To implement SFMPs and remain CSA Certified**	- Site/Species location	- Tracking in Genus - Sign-off of checklist to ensure training is tracked	

Critical Points	***Ensure clear understanding of your role & responsibility with respect to SAR.***
Safety & Quality	***Collect all relevant information, ensure information is passed on, ensure appropriate mgmt strategies are applied and implemented during operations. To ensure that all sightings and occurrences are diligently tracked.***

Step #	Description of Work Element	Cycle Time	Forms / Screens / Systems Used	
			Description	Where Found
1	**Training** • All new employees/contractors should understand their role and responsibility by reviewing the "SAR Training" PowerPoint presentation. • All employees/contractors should review & sign the checklist once they feel comfortable with all the information presented in the "SAR Training" presentation. **Note:** This is critical as SFM indicators are tied to training targets. • All staff are required to review/refresh the "SAR Training" every 3 years.	60 min	SAR Training PowerPoint	SAR Training
			SAR Training sign-off	SAR Training Signoff Checklist
2	**SAR Supervisor** By June 15th of each year: • Obtain the SAR Training results as tracked in the Training Tracking Database. • Compare the SAR Training results against the Training Matrix requirements to identify staff and contractors who haven't yet completed the SAR Training. • Contact the staff members and contractors who haven't completed the SAR Training and ensure that this is done(!).	30 min	Training Tracking Database	Through CAC Admin staff
3	**Field Staff** • Depending on the feature one should document and obtain as much detailed information as possible (complete field card, photos, sample, GPS location etc). • Make management decision in field at time of sighting if possible. • Notify Permitting Supervisor as soon as possible.	30 min	SAR Field Card	SAR Field Card
	Permitting Supervisor			

SAR SWP Location

- The Species at Risk and Sites of Biological Importance Program SWP can be found at the following link:

\\canfor.ca\Woods\Prince_George\WORKING\Procedures\species_at_risk\swp_sar_program_2010_04.doc

SAR Checklist/Signoff

FMG East
Species at Risk & Sites of Biological Significance Training
Sign Off and Review Checklist

Species At Risk Legislation	***Reviewed***	***Comment/Notes***
Federal Legislation governing SAR		
Provincial Legislation governing SAR		
Certification driving Canfor's SAR program		
Species At Risk Animals	***Reviewed***	***Comment/Notes***
Species likely not to be encountered and likely to be encountered in the defined forest areas		
Animal, Bird, Amphibian Species description, habitat, and range		
Animal Species Identified – WHAT SHOULD YOU DO?		
Sites of Biological Significance	***Reviewed***	***Comment/Notes***
Do you know how to identify a wildlife habitat feature and/or a site of biological significance?		
Site of Biological Significance Identified – WHAT SHOULD YOU DO?		
Species At Risk - Plants	***Reviewed***	***Comment/Notes***
Do you understand what to collect, if you think you have identified a rare plant?		
Plant Species at Risk Identified – WHAT SHOULD YOU DO?		
Species At Risk - Plant Communities	***Reviewed***	***Comment/Notes***
Do you know where to find the plant communities at risk within the PG TSA?		
Do you understand the importance of collecting detailed eco and site information for all potential plant communities at risk?		
If you have identified a potential plant community at risk, do you know where to find the Detailed Element Occurrence Field Form to fill out in order to further assess the plant community at risk?		
Plant Community at Risk Identified – WHAT SHOULD YOU DO?		
Have you reviewed the Species at Risk Standard Work Procedure?		
Have you completed your review of the SAR Training Powerpoint presentation?		
Do you know where to find: SAR field cards? SAR field guidebooks? PG TSA SAR Management Guidelines? SAR Plant Community Element Occurrence Field Form Other resources for the SAR Program? \\Corpfs02\Pgwoods\WORKING\Procedures\species_at_risk		

SAR Trainee: _____ **Date:** _____

SAR Checklist/Signoff Location

- The Species at Risk and Sites of Biological Importance Training Checklist /Signoff can be found at the following link:

\\canfor.ca\Woods\Prince_George\WORKING\Procedures\species_at_risk\sar_training_signoff_checklist_2010_04.doc

- Once the PowerPoint presentation has been reviewed, please fill out the Training Checklist/Signoff document and forward to Debbie Brandner.