



**CANADIAN FOREST PRODUCTS LTD.**

**Fort St. John & Chetwynd Operation**

# **Forest Vegetation Pest Management Plan**

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## **SECTION 1: INTRODUCTION**

### **1.1 CANFOR'S PEST MANAGEMENT PLAN FOR SILVICULTURE OBLIGATIONS AND INVASIVE SPECIES MANAGEMENT**

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](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 silviculture 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 licenses that Canfor Fort St. John and Chetwynd Division has or manages within the Fort St. John and Dawson Creek Timber Supply Area of the Peace Forest Region. This area includes Tree Farm License 48 and any of Canfor's managed openings that are contained within the areas identified on the Fort St. John and Chetwynd division Pest Management Plan Area Map (Appendix 1).

### **1.3 RESPONSIBILITY FOR VEGETATION MANAGEMENT**

Within Canadian Forest Products Ltd., Fort St. John Division and Chetwynd Division, the principal contact for information relating to this Pest Management Plan (PMP) is:

The Silviculture Department: [fsj.pmpinfo@canfor.com](mailto:fsj.pmpinfo@canfor.com)

### **1.4 PEST MANAGEMENT PLAN LEGISLATION**

A PMP is a plan that describes:

- A program for managing vegetation 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 FIRST NATION CONSIDERATIONS**

The scope of this plan encompasses a large area that includes the traditional territories of many First Nation communities. Canfor will attempt to address specific concerns on a block by block basis through the annual notification process sent out prior to each brushing season. For areas of specific concern, Canfor commits to meet with community representatives, review plans and alternatives, and where viable, alter plans accordingly so that mutual goals can be reached.



## **1.6 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., Fort St. John and Chetwynd Division vegetation management program.

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## **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 fill planting,
- newly planted seedlings,
- juvenile, commercially valuable coniferous trees,
- vehicle and driver safety along roads used to access forest sites within the area encompassed by this PMP,

This includes invasive and/or noxious species encountered. Invasive species refers to non-native or alien species to the ecosystem of which through their introduction causes or is likely to cause economic and/or environmental consequences and/or harm to the health of humans and/or wildlife. Noxious weeds refer to any invasive plant that is designated to be noxious under the B.C. Weed Control Act (WCA) and Regulations.

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 stock type selection, need for site preparation, and scheduling of future treatments and assessments.

- *Early Identification of Brush Prone Sites* – biogeoclimatic ecosystem classification (BEC) zones and site series known to have high brush hazards are identified in the pre- and post-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 biogeoclimatic ecosystem 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 fill-planting 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 scenarios 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 biogeoclimatic 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 Llyod)
- *Trees, Shrubs, Flowers* (Lyons)

- *Autecology of Common Plants in British Columbia: A Literature Review* (Haeussler, Coates and Mather)

For invasive and/or noxious species identification these include:

- E-Flora BC (<http://www.geog.ubc.ca/biodiversity/eflora/>)
- Province of BC's Invasive Species Management website (<https://www2.gov.bc.ca/gov/content/environment/plantsanimals-ecosystems/invasive-species/publications> & (<https://www2.gov.bc.ca/gov/content/environment/plants-animals-ecosystems/invasivespecies/priority-species/priority-plants>)

### 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 Table 1, 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 (Land Resource Manager).

**Table 1: Methods for monitoring seedling performance and vegetation**

Monitoring Method and Data Collected	Frequency
<i>Walkthrough - Post Harvest</i> – Walkthrough or aerial survey used to confirm ecology classification on 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.	Once – after harvesting, prior to planting
<i>Survey - Regeneration Performance</i> – 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. Required data collection must be adequate to determine if thresholds are exceeded for brush problems.	Once - 2 or 3 growing seasons after planting
<i>Walkthrough - Regeneration Performance</i> – Informal walkthroughs on more homogenous sites where seedling performance and competition hazard are easier to evaluate. Required data collection must be adequate to determine if thresholds are exceeded for brush problems.	May be scheduled when more information is required for a treatment decision.
<i>Walkthrough - Free Growing Recce</i> - Walkthrough survey used to confirm that block, or specific strata, will meet standards for Free Growing before a Free Growing Survey is undertaken. Data appropriate to determine if thresholds are exceeded for brush problem (if one exists) is collected.	Once – 5-10 growing seasons after planting. Scheduled as needed as survey regime progresses.
<i>Aerial Recce</i> - A site visit from the air and is mainly used to assess crop tree height, density and distribution, as well as brush competition and distribution.	May be scheduled when more information is required for a treatment decision.
<i>Survey - Free Growing</i> - 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. Data appropriate to determine if thresholds are exceeded for brush problem (if one exists) is collected.	Once - 5 to 15 growing seasons after planting.
<i>Post Treatment Audit</i> – Ground or aerial inspection which collects the following: <ul style="list-style-type: none"> <li>➢ Effectiveness of the brushing treatment in controlling the target vegetation.</li> <li>➢ Effects on any non-target vegetation.</li> <li>➢ Need for follow-up treatments.</li> <li>➢ For chemically brushed areas, any impact of herbicide application on “no treatment zones”.</li> </ul>	Once per treatment year within 12 months of treatment.
<i>Ocular Road Assessment</i> – An ocular assessment of roadside vegetation and its potential impacts to vehicle/worker safety. No official report or data will be collected however pictures will be taken with a description of the location and the potential adverse impacts identified.	Once per treatment year within 12 months of treatment.



### 2.3.4 Treatment Thresholds and Decisions

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:

**Scenario 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, but are not limited to, red elderberry, *Rubus* species (e.g. thimbleberry), *Ribes* species, black twinberry, *Sorbus* species, white-flowered rhododendron, 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. Table 2 below describes the measure of vegetation competition and seedling impact justifying treatment.

**Table 2: Treatment threshold for vegetation management under Scenario 1**

Indicator	Threshold Chosen	Measure	Treatment Threshold
1. Sturdiness Ratio/Height-toDiameter Ratio (HDR)	Seedlings will react to competition for light by emphasizing height growth rather than putting growth resources into an even balance between height and diameter growth. This will result in high height to diameter ratios and a tree susceptible to vegetation and snow press. These thresholds are derived from past experience and monitoring.	Seedling Height (cm) <i>divided by</i> Root Collar Diameter (cm)	Sx, Fdi > 50 Pl, BI > 40* > 50% of stems exceeding HDR
2. Vigour	Seedlings will react to competition for light in ways that can be visually categorized into seedling vigour classes. Thresholds indicated are derived from past experience and monitoring.	1 – Poor 2 – Fair 3 – Good	All species: > 50% in Class 1 or 2
3. Comeau's Index <sup>1</sup>	Comeau's Index, a commonly used vegetation index, is a measure of total density of vegetation multiplied by vegetation height divided by crop tree height.	sum (% cover of brush species x height) <i>divided by</i> (tree height)	> 80
4. Crop Tree Status	Status of a crop tree with respect to height and density of competing vegetation will impact the degree with which the seedling is being affected.	1 – Overtopped 2 – Threatened 3 –Above Brush	All Species > 50 of trees in 1 or 2

\* Sx = Interior hybrid Spruce, Fdi = Interior douglas-fir, Pl= Lodgepole pine, BI = Subalpine fir

<sup>1</sup> 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 tree 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 Silviculture Prescription/Site Plan. The following provide links to the Land Management Handbooks pertaining to the area covered by this PMP. <https://www.for.gov.bc.ca/hfd/pubs/Docs/Lmh/Lmh65.pdf>

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

**Table 3 (a) : Brush hazard rating for select biogeoclimatic ecosystem zones, sub-zones, variants, and site series in the Fort St. John Division**

Biogeoclimatic Zone, Subzone and Variant	Site Series						
	101	102	103	104	110	111	112
BWBS mw	Very high	low	low	low	very high	extreme	high
BWBS mk	High	low	moderate	low	high	high	
BWBS wk2	moderate	low	low	low	moderate	very high	
	<b>01</b>	<b>02</b>	<b>03</b>	<b>04</b>	<b>05</b>	<b>06</b>	<b>07</b>
ESSF mv4	Mod - high		low	high	very high		

**Table 4 (b) : Brush hazard rating for select biogeoclimatic ecosystem zones, sub-zones, variants, and site series in the Chetwynd Division**

Biogeoclimatic Zone, Subzone and Variant	Site Series						
	101	102	103	104	110	111	112
BWBS mw	very high	low	low	low	very high	extreme	high
BWBS mk	moderate	low	moderate	low	high	high	
	<b>01</b>	<b>02</b>	<b>03</b>	<b>04</b>	<b>05</b>	<b>06</b>	<b>07</b>
SBS wk2	high	low	moderate	low-mod	very high	very high	
ESSF wk2	high	low-mod	high	very high	very high	high	
ESSF mv2	moderate		low	high	very high	very high	
ESSF wc3	high	low-mod	low				

BEC classes rated as moderate, high, very high, or extreme may need treatment based on the predictive herbaceous scenario. Where treatments are prescribed, a follow up site visit will be conducted to confirm treatment (conducted the same season, prior to treatment). These proactive treatments may minimize the potential for repeated treatments. The thresholds are described in Table 4.

**Table 5: Treatment thresholds for vegetation management under Scenario 2**

Indicators	Thresholds Chosen	Measure	Treatment Threshold
Brush hazard by BEC	Based on local knowledge of treatment responses, observed data from surveys, and BEC, predictions are made as to the likelihood of requiring treatment. This is combined with Comeau's Index to prescribe treatment.	See Table 3	Moderate, High, Very High, brush hazard rating
Comeau's Index	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
Indicator Species	Prediction of vegetation development potential is aided by consideration of species present at the time of assessment. Presence/absence of a narrow list of species in early brush development provides an indication of likelihood that brushing will be required.	Visual	Presence of grasses, alder, willow, aspen, cottonwood, cow parsnip*

**Scenario 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, balsam poplar, black cottonwood and alder species.

**Treatment objectives** for this scenario are to release crop trees from competition of deciduous species. Treatment thresholds are based on density and distribution of deciduous trees that reduce stocking and impact the ability to meet legal obligations as specified in the approved Sustainable Forest Stewardship Plan 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 Practices Regulations Section 46.11 (link below).  
[http://www.bclaws.ca/EPLibraries/bclaws\\_new/document/ID/freeside/12\\_14\\_2004#section46.11](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 (link below).  
<https://www.for.gov.bc.ca/isb/forms/lib/FS660.pdf>

### 2.3.5 Treatment Options and Selection Criteria

When undertaking vegetation management there are a range of commonly used treatment options available. Tables 5-10 describe the various treatments considered under this PMP, their relative benefits and limitations, and a rationale for selecting the treatment under this PMP.

**Table 6: Aerial (helicopter) application methods for herbicides**

Herbicide - Helicopter Methods	
<b>Helicopter Discretionary</b> - Non-continuous, discretionary application of herbicide across portions of areas within a cutblock. Equipment includes a helicopter with low-pressure boom with conventional or high volume nozzles. Varying glyphosate application rates possible.	
<b>Helicopter Broadcast</b> - Continuous application of herbicide across all or a portion of areas within a cut block. Equipment includes a helicopter with low-pressure boom with conventional or high volume nozzles. Varying glyphosate application rates possible.	
Benefits	Limitations
➤ Highly effective control over a number of years	➤ Less selective than other methods.

<ul style="list-style-type: none"> <li>➤ Little to no contact of herbicide to workers</li> <li>➤ Lowest cost brushing method</li> <li>➤ Able to treat slashy, steep ground more safely than a ground treatment.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Stringent application constraints</li> <li>➤ High public profile</li> <li>➤ Intensive preparation and follow up</li> <li>➤ Mature leave trees limit use of this method.</li> <li>➤ Visual quality affected for a number of years</li> <li>➤ Technically demanding</li> </ul>
<p><i>Rationale for Selecting Treatment Method in PMP</i> –We have not found a more effective, cost efficient method for vegetation control, and we have found this method to be the safest in regards to workers on the ground.</p>	

**Table 7: Ground-based herbicide application methods**

<b>Herbicide - Backpack Methods</b>	
<p><b>Backpack Discretionary</b> - 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.</p>	
<p><b>Backpack Broadcast</b> - 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.</p>	
<b>Benefits</b>	<b>Limitations</b>
<ul style="list-style-type: none"> <li>➤ Effective control over a number of years.</li> <li>➤ Can treat on blocks with lots of mature standing leave trees.</li> <li>➤ Can be applied with more precision, and applicator can be more “selective” than a helicopter.</li> <li>➤ Little or no buffer zone required protecting PFZ.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Stringent application constraints</li> <li>➤ Intensive preparation and follow up</li> <li>➤ Effectiveness diminishes as height of brush increases.</li> <li>➤ Needs a very high level of supervision and layout.</li> <li>➤ Higher potential of worker exposure to herbicide.</li> <li>➤ Safety concerns with wearing heavy equipment on rough terrain.</li> </ul>
<p><i>Rationale for Selecting Treatment Method in PMP</i> –This method is a key tool, and is especially useful in areas that have lots of leave trees and herbaceous vegetation.</p>	
<b>Herbicide - Brushsaw Methods</b>	
<p><b>Cut Stump</b> - 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.</p>	
<b>Benefits</b>	<b>Limitations</b>
<ul style="list-style-type: none"> <li>➤ Effective control over a number of years preventing re-sprouting of target vegetation.</li> <li>➤ Much bigger treatment window versus other herbicide treatment methods.</li> <li>➤ Little or no buffer zone required protecting PFZ.</li> <li>➤ Very little herbicide exposure to workers.</li> <li>➤ Can be applied with more precision, and applicator can be more “selective” than a other methods</li> <li>➤ Uses less herbicide on a given area (reduced application rate)</li> </ul>	<ul style="list-style-type: none"> <li>➤ Stringent application constraints</li> <li>➤ Intensive preparation and follow up</li> <li>➤ Needs a very high level of supervision and layout.</li> <li>➤ Safety concerns with wearing heavy equipment on rough terrain.</li> <li>➤ Expensive equipment required.</li> </ul>
<p><i>Rationale for Selecting Treatment Method in PMP</i> –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.</p>	
<b>Herbicide – Basal Bark</b>	
<p><b>Basal Bark</b> – Non-continuous, discretionary application of herbicide onto surfaces of target vegetation only.</p>	
<b>Benefits</b>	<b>Limitations</b>

<ul style="list-style-type: none"> <li>➤ Effective control over a number of years.</li> <li>➤ Can treat on blocks with lots of mature standing leave trees.</li> <li>➤ Can be applied with more precision, and applicator can be more “selective” than a helicopter.</li> <li>➤ Little or no buffer zone required protecting PFZ.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Stringent application constraints</li> <li>➤ Intensive preparation and follow up</li> <li>➤ Needs a very high level of supervision and layout.</li> <li>➤ Higher potential of worker exposure to herbicide.</li> <li>➤ Safety concerns with wearing heavy equipment on rough terrain.</li> </ul>
<p><i>Rationale for Selecting Treatment Method in PMP</i> – 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. Treatment does not immediately increase slash level in treatment area.</p>	
<p><b>Herbicide – Vehicle Mounted Sprayer / Roadside for Invasive Species Control</b></p>	
<p><b>Roadside Brushing</b> - Broadcast application of herbicide onto target vegetation for control of brush along roadsides, to improve visibility and safety for road users. Typically applied using a truck- or ATV-mounted sprayer.</p>	
<p><b>Vehicle Mounted Discretionary</b> - Non-continuous, discretionary application of herbicide across portions of areas within a cutblock. Equipment includes a motorized vehicle equipped with a pump, holding tank for spray mix, and low pressure nozzles attached to handguns, booms, and / or boomless nozzles.</p>	
<p><b>Vehicle Mounted Broadcast</b> - Continuous application of herbicide across all or a portion of areas within a cut block. Equipment includes low-pressure backpack sprayer with adjustable nozzles. Equipment includes a motorized vehicle equipped with a pump, holding tank for spray mix, and low pressure nozzles attached to handguns, booms, and / or boomless nozzles.</p>	
<p><b>Benefits</b></p>	<p><b>Limitations</b></p>
<ul style="list-style-type: none"> <li>➤ Effective control over a number of years.</li> <li>➤ Can treat on blocks with lots of mature standing leave trees.</li> <li>➤ Can be applied with more precision, and applicator can be more “selective” than a helicopter.</li> <li>➤ Increases road safety by improving visibility</li> </ul>	<ul style="list-style-type: none"> <li>➤ Intensive preparation and follow up</li> <li>➤ Effectiveness diminishes as height of brush increases.</li> <li>➤ Needs a very high level of supervision and layout.</li> <li>➤ Higher potential of worker exposure to herbicide.</li> <li>➤ Restricted to road or all-terrain vehicle accessible locations</li> </ul>
<p><i>Rationale for Selecting Treatment Method in PMP</i> – This method is a good tool for controlling vegetation along roadsides, namely where there are safety concerns due to poor visibility from encroaching vegetation.</p>	

**Table 8: Ground-based non-herbicide methods - small engine**

<p><b>Non-Herbicide – Brushsaw Method</b></p>	
<p><b>Manual Brushing</b> – Worker cuts target vegetation with a brushsaw or chainsaw.</p>	
<p><b>Benefits</b></p>	<p><b>Limitations</b></p>
<ul style="list-style-type: none"> <li>➤ No herbicide use.</li> <li>➤ Public acceptance</li> <li>➤ Can be applied selectively</li> <li>➤ Can be used in riparian areas or pesticide free zones</li> </ul>	<ul style="list-style-type: none"> <li>➤ Re-sprouting of target species, may require re-treatment</li> <li>➤ Safety hazards associated with saws, exhaust fumes, and repetitive motion injuries.</li> <li>➤ High treatment cost. Expensive equipment required.</li> <li>➤ Relative short window for treatment (after leaf out to end of July).</li> <li>➤ Not effective on herbaceous brush.</li> </ul>
<p><i>Rationale for Selecting Treatment Method in PMP</i> - Can be effective if crop trees are taller and not suppressed (but will not make “Free Growing”)</p>	

**Table 9: Ground-based non-herbicide methods - hand tools**

<p><b>Non-Herbicide – Girdle</b></p>	
<p><b>Manual Girdling</b> – Worker uses hand-girdling tool and removes a continuous strip of bark around individual stems, eventually (2-3 years) killing the trees.</p>	
<p><b>Benefits</b></p>	<p><b>Limitations</b></p>
<ul style="list-style-type: none"> <li>➤ No herbicide use.</li> <li>➤ Public acceptance.</li> <li>➤ Can be applied selectively.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Re-sprouting, may require multiple treatments.</li> <li>➤ High treatment cost due to low productivity.</li> <li>➤ Cannot use for herbaceous.</li> </ul>

➤ Low cost hand tools so workforce can gear up easily.	➤ Repetitive strain injuries common.
<i>Rationale for Selecting Treatment Method in PMP</i> - Can be effective if crop trees are taller and not suppressed (but will not make “Free Growing”)	

**Table 10: Ground-based non-herbicide methods - livestock**

<b>Non-Herbicide – Sheep</b>	
<b>Sheep Grazing</b> – 1-3 shepherds guide a herd of sheep (1,000 – 1,500 head) through areas where they eat target vegetation.	
<b>Benefits</b>	<b>Limitations</b>
<ul style="list-style-type: none"> <li>➤ No herbicide use.</li> <li>➤ Not constrained by weather conditions.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Moderate to high amounts of damage to crop trees (especially Pli and Fdi and any species in June)</li> <li>➤ High treatment cost.</li> <li>➤ Can only use for certain herbaceous species and only provides a couple months of control.</li> <li>➤ Can only use on good access, flat blocks with low to no slash.</li> <li>➤ Need a group of blocks in close proximity to make a “program”.</li> <li>➤ Risk of disease spread to wild ungulate populations.</li> <li>➤ Potential damage to pesticide free zones and riparian areas from herd.</li> <li>➤ Risk of predation.</li> </ul>
<i>Rationale for Selecting Treatment Method in PMP</i> - Only other realistic option to herbaceous treatment if herbicide cannot be used.	

**Table 11: Ground-based non-herbicide methods - site preparation**

<b>Non-Herbicide – Mechanical Site Preparation</b>	
<b>Mechanical Site Prep</b> – 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)	
<b>Benefits</b>	<b>Limitations</b>
<ul style="list-style-type: none"> <li>➤ No herbicide use.</li> <li>➤ Public acceptance.</li> <li>➤ Increased soil temperature</li> </ul>	<ul style="list-style-type: none"> <li>➤ Temporary brush control</li> <li>➤ Expensive</li> <li>➤ Access limitations</li> <li>➤ Possible soil compaction and rutting</li> <li>➤ Potential for surface erosion</li> <li>➤ High visual impact</li> <li>➤ Site constraints – slope, slash, duff layer depth</li> </ul>
<i>Rationale for Selecting Treatment Method in PMP</i> – Creates favourable microsites and achieves temporary brush control	

### 2.3.6 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.

Appendix 2 illustrates the process and describes guidelines for selecting an appropriate brushing method in Canfor Fort St. John and Chetwynd. This process is greatly simplified and the actual treatment choice may be different than below with a stated rationale.

For roadside brushing, treatment options are limited to invasive species control. In pesticide free zones or other sensitive areas (e.g. unstable slopes), manual brushing will be used.

### 2.3.7 Post-Treatment Evaluation

All blocks where treatment has been conducted will be visually assessed within 12 months of treatment. Table 11 details aspects of the treatments to be evaluated.

**Table 12: Post-treatment evaluation considerations**

<b>Efficacy</b>
Coverage of intended treatment area
<ul style="list-style-type: none"> <li>absence of striping (herbicide applications only)</li> <li>absence of missed areas</li> </ul>
Treatment Efficacy
<ul style="list-style-type: none"> <li>level of removal of target vegetation</li> <li>current level of competition</li> </ul>
Seedling Damage
<ul style="list-style-type: none"> <li>level of seedling damage</li> <li>location of damage, if any (terminal bud, needles, stem, etc.)</li> </ul>
Prescription Evaluation
<ul style="list-style-type: none"> <li>treatment meets needs of plantation</li> </ul>
<b>Compliance</b>
Pesticide Free Zones (herbicide applications only)
<ul style="list-style-type: none"> <li>no evidence of herbicide compromise into Pesticide Free Zones</li> </ul>
Boundaries
<ul style="list-style-type: none"> <li>as mapped on final treatment boundary maps</li> <li>consistent with treatment plan</li> <li>no evidence of herbicide outside of marked boundaries (herbicide applications only)</li> </ul>

Non-compliance of herbicide applications identified during the post-treatment evaluation 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 FOR HERBICIDE USE**

### **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 (2005). 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 one 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**

Vegetation management activities involving the use of herbicides under this PMP will incorporate 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

Strategies for protecting community watersheds, domestic water sources, fish, wildlife, riparian areas, and wildlife habitat features for vegetation management activities that do not involve the use of herbicides will be in accordance with any or all of:

- Forest Planning and Practices Regulation
- Forest Stewardship Plan
- Sustainable Forest Management Plan
- the site plan/silviculture prescription for the site
- any other pertinent higher-level plan, directive, or guideline

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 Fort St. John and Chetwynd 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 for domestic or agricultural purposes on Canfor's tenure where 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](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**

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.

A Pesticide Free Zone will be established along the first 100m of any non-classified drainage or S6 stream that has a direct connection to a fish stream reach.

Wildlife Habitat Features found in the Canadian Forest Products Ltd., Fort St John and Chetwynd Divisions are listed in the following:

[http://www.env.gov.bc.ca/cgi-bin/apps/faw/wharesult.cgi?search=wlap\\_region&wlap=Peace](http://www.env.gov.bc.ca/cgi-bin/apps/faw/wharesult.cgi?search=wlap_region&wlap=Peace)

#### **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 Plans and Sustainable Forest Management System.

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.

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.

When, during the information-sharing or referral process, an interested party has identified site-specific locations of highly productive berry patches or medicinal plants within a proposed treatment area, and the existence of these berries and/or medicinal plants has been confirmed in the field at the site by a field visit and every effort will be made to protect these areas through implementation of pesticide free zones, treatment selection, or scheduling of treatments. If pesticide free zones are established, they will be of adequate size to ensure no pesticide from the treatment will impact the food plants.

At this time, the only expected “food plants” that are used are berries and medicinal plants. It is presumed that a majority of the harvesting of berries and medicinal plants occurs along all-weather roads throughout the District, but exact locations and the types of plants being harvested are not available. If chemical treatments are proposed for use in vegetation pest control, and no concerns have been raised about protection of berries and/or medicinal plants within the treatment area, the treatment will occur as planned. Signs will be posted to inform any potential gatherers of the locations and times that treatment will occur. Also, treatment of areas within 1km of permanent, private residences on private land will not occur until the owner of the residence has been notified.

#### 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
Aerial Foliar (conventional)	>26.5 C No Spray	No Spray	>8 No Spray	<40 No Spray	No Spray	No Spray
Aerial Foliar (low drift)	>30 C No Spray	No Spray	>8 No Spray	<35 No Spray	No Spray	No Spray
Backpack, Foliar	>26.5 C No Spray	No Spray	>10 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 Aerial Herbicide Equipment**

All equipment shall be calibrated prior to commencing operations for that season. Proof of this calibration for aerial applications and the swath kit analysis shall be kept by the treatment contractor for at least 2 years.

Maintenance of the spray equipment is the responsibility of the application contractor. The contractor shall have qualified personnel on each spray site who will ensure the equipment conforms, at all times, to the manufacturer's standards.

### **4.6.2 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	Aerial	Ground	
Vision, Vision Max Vantage Forestry, Glysil, Timberline	glyphosate	common	yes	yes	19899, 27736, 26884, 29009, 33456
Release, Garlon RTU, TeraGro, Garlon XRT	triclopyr	common	no	yes	22093, 29334, 33049, 28945
Katana	flazasulfuron	new	no	yes	33129
Milestone	aminopyralid	common	no	yes	28517
Clearview, Sightline A	Aminopyralid and Metsulfuron- methyl	common	no	yes	29752, 30409
Lontrel XC	Clopyralid	common	no	yes	32795

**Glyphosate** is the most commonly used herbicide in forestry. 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. It is not persistent because it is rendered inactive when it contacts soil.

**Triclopyr** is a selective herbicide that controls many invasive broadleaf plants. As it is very effective in controlling many recently identified invasive shrubs and deciduous species, it is being included in the plan for ground-based treatment. It works by accumulating in the areas of active cell growth and interfering with normal plant growth processes.

**Flazasulfuron** is a selective systemic herbicide. After being absorbed through leaves and translocated through the meristematic zone, it inhibits a key enzyme which results in the cessation of cell division for plant growth.

**Aminopyralid** is broadleaf specific herbicide registered for use in invasive plant control. It is absorbed through leaves and routes and translocates throughout the plant as synthetic enzyme.

**Metsulfuron-methyl** is a non-selective residual herbicide that is effective in the control of difficult invasive species. It works by causing rapid inhibition of plant cell division and growth.

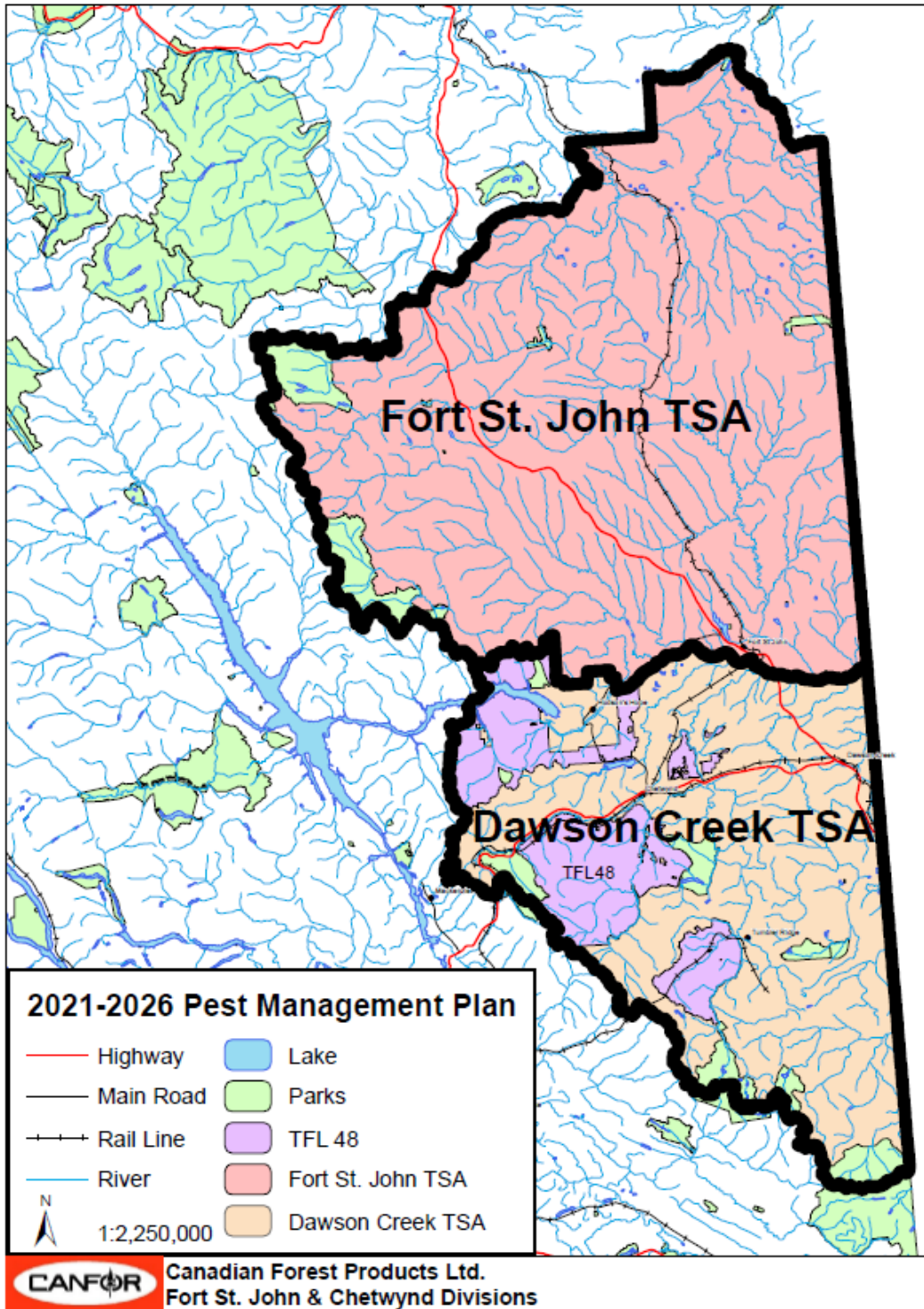
**Clopyralid** is a selective, residual herbicide that does not persist in soil as long as some others such as picloram. It is especially effective against invasive species such as thistle.

The following adjuvants may be added to the herbicides proposed for use under this PMP:

Adjuvant Trade Name	Application		Pesticide Control Products Act #
	Aerial	Ground	
Gateway	no	yes	31470
Xiameter OFX-0309	no	yes	23078
Agral 90	no	yes	24725

**Surfactants or adjuvants** are chemicals that are sometimes added to herbicide mixes to allow for easier mixing, to assist in the spreading and wedding of, and adherence to the surface of the plants being treated. This has been shown to decrease the possibility of drift. Some adjuvants and surfactants may also be used to adjust the pH of the herbicide spray mix, reducing degradation.

## Appendix 1: Fort St. John and Chetwynd Division Pest Management Plan Area Map





## Appendix 2: Treatment Decision Matrix

### TREATMENT DECISION MATRIX

**IMPORTANT INITIAL CONSIDERATIONS:** Are the conditions where treatment is to occur safe for the workers that are to perform the chosen duty? Does the block have difficult to no access? If not, outline the hazards and determine if the hazards can be mitigated. If hazards are too unsafe or if the access to the block is limited to none, aerial methods may need to be applied as the treatment of choice.

