Western Forest Products Inc.
DEFINING A HIGHER STANDARD™

Pest Management Plan

File reference: WFP-SFO-PMP-2020
For the period 2020-2025

For Forest Vegetation Management on:
TFL 39, Block 1

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To be submitted to: **Integrated Pest Management Program**
Ministry of Environment and Climate Change Strategy

Signing Authority:	**Prepared by:**
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1. SUMMARY

1.1 Purpose

Western Forest Products Inc., Stillwater Forest Operations, has prepared a *Pest Management Plan* (PMP) to facilitate *vegetation management* in the forestlands it manages around Powell River. The overall purpose is to describe the Integrated Pest Management strategies used to manage vegetation pests. This includes describing and managing *ecosystems* to prevent vegetative pest problems, identifying and forecasting of pest vegetation, monitoring and prescribing treatments based on thresholds, treatments of vegetative pests, and documentation and evaluation of the effectiveness of the treatments. In addition, the plan describes how environmental values and human health are protected, the standards used for herbicide applications, and the process followed for information sharing with First Nations and the public.

Vegetation management is just one phase in the overall management of a stand of trees over a rotation. It is mainly done to ensure that newly established tree seedlings survive, that growth rates of trees stay at acceptable levels, and to prevent competing vegetation from impeding crop trees from reaching *free growing* within legislated time frames. Failure to meet the free growing standards can result in penalties and has potential implications on the future timber supply.

Stillwater Forest Operations is committed to using *herbicides* only when alternatives will not meet the forest management goals. This PMP is not an endorsement to increase the use of herbicides. It is an open approach to *integrated pest management* by clearly spelling out where and how herbicides or other pest management controls will be applied.

1.2 Scope

The land area covered by this Pest Management Plan encompasses one tenure: Tree Farm Licence 39, Block 1 (approximately 69,000 hectares of productive forest area). The PMP only applies to those areas managed by Western Forest Products. The plan area is within the administrative boundaries of the qathet Regional District. The geographic location of the plan area is from the upper Theodosia Valley and Powell Daniels in the North, to south of Lois Lake in the South-East and to Powell River in the South-West. For Community Watershed information see Section 5.1. See Appendix 1 for the map showing the scope and location of the PMP area.

1.3 Contact Information

The primary individual responsible for managing pests under this plan area is Nancy Pezel, RPF.
For information relating to this plan please contact:
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1.4 Term of the Plan

The term of the plan is for 5 years from the date the Pesticide Use Notice is confirmed by the BC Ministry of Environment and Climate Change Strategy.

1.5 Treatment Regimes

The plan area contains portions of five *biogeoclimatic* subzones. The potential target species are hardwoods including but not limited to big-leaf maple, red alder, bitter cherry, willow, and herbaceous vegetation including but not limited to thimbleberry, salmonberry, raspberry, elderberry, bracken fern, fireweed, as well as invasive species including Japanese knotweed, butterfly bush, and scotch broom. The manual treatment techniques are girdling, manual brushing and weeding, mechanical brushing and weeding, knockdown and pulling, and prescribed burning. The herbicides used are Vantage (active ingredient glyphosate), and Garlon (active ingredient triclopyr). Sylgard 309 or other surfactants may be used as an additive with glyphosate. The chemical treatment techniques include foliar sprays (backpack sprayer), individual tree injections, brushsaw applicator, basal applications, cone sprayer and stump treatment but basal applications will be the predominant technique used if herbicides are prescribed.

Terms in *italics* in this document are defined in the Glossary.

2. OVERVIEW AND HISTORY OF THE PLAN AREA

2.1 Forest Cover

The plan area consists of a range of forest types and ecosystems from the valley floor to high elevation forest. There is a long history of logging and large forest fires in the area, which has resulted in significant areas of older second growth timber. The old forests in the plan area are dominated by western hemlock and Amabilis fir, while the immature forests are mainly composed of Douglas-fir, western hemlock and western red cedar and red alder. Brush competition can be high in both richer & drier ecosystems.

2.2 Competitive Species

The major competitive species are those that have the highest impact on the growth of the newly regenerated forests in the plan area. The herbaceous vegetation exhibits rapid early growth rates and is the prime competitor early in the rotation. Later, the woody stem plants and deciduous trees are the main competitors for light, nutrient, water and growing space.

Table 1 lists the major competing vegetation species to be managed within the PMP area and corresponding *biogeoclimatic* subzones

Table 1. Major competing vegetation species and biogeoclimatic subzones in the PMP area

Major Competing Vegetation Species		Biogeoclimatic Subzones
Common Name	**Latin Name**	
Bigleaf maple	Acer macrophyllum	*CWHxm1, dm, vm1*
Red Alder	Alnus rubra	*CWHxm1, dm, vm1,vm2*
Bitter Cherry	Prunus emarginata	*CWHxm1, dm, vm1*
Salmonberry	Prunus spectabilis	*CWHxm1, dm, vm1*
Thimbleberry	Rubus parviflorus	*CWHxm1, dm, vm1,vm2*
Red Elderberry	Sambucus racemosa	*CWHxm1, dm, vm1*
Bracken fern	Pteridium aquilinum	*CWHxm1, dm, vm1,vm2*
Fireweed	Epilobium angustifolium	*CWHxm1, dm, vm1,vm2, MHmm1*
Blackberry	Rubus discolor	*CWHxm1, dm, vm1, vm2*

Bigleaf maple (Acer macrophyllum) is a *deciduous* tree species and is found at low to mid elevations in the plan area. It occurs in dry to moist sites, often with Douglas fir, on sites disturbed by fires or logging. Dense *coppices* are formed following cutting of the initial stem. The coppices tend to form ball-shaped crowns with diameters similar to their height - six meters plus in the first four years following harvest. Within this ball, coniferous species are overtopped and will often suffer *mechanical damage*. Young seedlings growing in close proximity of maple coppices will often be choked under a mat of fallen leaves. Maple from seed tends to have a single stem and narrower crown. Sometime in the future we anticipate that bigleaf maple will be managed for hardwood production, but at the current time the Ministry of Forests, Lands and Natural Resource Operations and Rural Development will not allow it.

Red alder (Alnus rubra) is a *deciduous* tree species common throughout the plan area from valley bottom to approximately 1,000m elevation. It arises from airborne and latent seed in lower elevation cut blocks one to eight years following harvesting. Along creek margins, roads, skid trails and other heavily disturbed areas, it regenerates naturally at densities up to 10,000 stems per hectare (*sph*), and up to 5000 sph elsewhere. The growth of red alder is rapid following establishment and often outgrows conifer plantations. Competition for light can be high in two to five years following conifer establishment, depending on density and conifer species.

Bitter cherry (Prunus emarginata) arises from *seed banks* 1 to 3 years after harvest. Although it occurs in many blocks it is usually isolated to small patches with densities in the 500 to 2000 *sph* range. Occasionally it occurs at densities up to 40,000 sph. Compared with red alder, the species is a slow grower - 0.5 to 1 meters per year - has a narrow crown, and drops its leaves early in the fall - usually around late August. In many cases the species is not a serious competitor and only causes some minor mechanical damage in the early years of a stand.

Salmonberry (Rubus spectabilis) is common throughout the wetter and richer ecosystems of the entire plan area.

Thimbleberry (Rubus parviflorus) occupies almost the same, but slightly drier, *niche* as salmonberry. These Rubus species arise from seed or *rhizomes* or are pre-existing in stands with a deciduous component or with natural gaps from *blowdown*. When it is pre-existing at the time of harvest, it can be particularly vigorous following the harvest with rapid early growth from the existing root system, even if the above-ground portion is knocked-off by the harvesting disturbance. This species can be a serious competitor for light and nutrients. Once established, it will often form contiguous covers that will shade any over-topped *conifers*. All tree seedlings in this situation will experience significantly reduction in growth and vigour and eventually mortality if no remedial actions are taken.

Red Elderberry (Sambucus racemosa) is common throughout the wetter and richer portions of the plan area. The species arises from seed or rhizomes or is pre-existing in stands with a deciduous component or with natural gaps from blowdown. In the latter case the vigour of the plant is high, and early growth is rapid, because it has an existing root system even if the harvesting knocks off the stem. Early growth can be rapid - up to two meters per annum. It occasionally forms contiguous patches but is more often dispersed, and is a moderate competitor for light. It will sometimes cause mechanical damage.

Bracken (Pteridium aquilinum) arises from *rhizomes*. On moderate to rich sites, where can reach heights greater than two meters, this fern species will cause mechanical damage to crop trees because it creates a pressing action on the trees often after snowfalls. Competition for light can be extreme but is generally moderate. In well-established patches the species appears to exclude other plants, perhaps as a result of *allelopathy*. This in combination with light deprivation can cause mortality. Ground foliar treatments of the species are warranted in these thicker patches.

Fireweed (Epilobium angustifolium) arises from seed banks throughout the plan area and is often a serious competitor during early growth stages. Initial growth of fireweed is rapid, attaining heights up to three meters. During the winter season, the canes often cause mechanical damage due to press. When combined with snow and/or steep ground, press can cause severe stem deformity breakage and mortality. Competition for light, moisture and nutrients can be considerable on the drier and poorer sites. It seeds prolifically and establishes quickly following harvesting.

Other than the major competing vegetation mentioned above, other minor competing vegetation may occasionally require vegetation management. Some of the most common **minor competing vegetation** includes:

Cascara (Rhamnus purshiana) is a large shrub/small tree found in the dry, low elevation areas of the plan. Cascara is a slow growing tree and not very competitive, and is usually conserved.

Red-Osier Dogwood (Cornus stolonifera) is occasionally a fierce competitor on moist and wet sites.

Slide or Sitka alder (Alnus crispa) is a shrub that occurs, from mid to subalpine elevations in the plan area, on avalanche tracts, along streams, and in recent deglaciated areas. Because Sitka alder is often associated with natural non-productive ground, brushing treatment is rarely necessary. When treatment is prescribed, it is as per red alder.

Willow spp. most often are minor competitors and are good forage species for mammals.

Pacific Dogwood (Cornus nutalii) is a small *deciduous* tree and can grow vigorously in early years but is not considered to be a long-term competitor in this region. The blossom of this small tree is the floral emblem of British Columbia and law prohibits the collection of its wood. This species is deliberately conserved, but may require treatment when coppiced.

Rubus species- secondary: Blackcap (Rubus leucodermis) and **Trailing Blackberry** (Rubus ursinus) are common and often abundant in disturbed sites (especially burned or cut over areas) or open forests throughout the plan area. **Himalayan Blackberry** (Rubus discolor) is an Asian species introduced via England and widely naturalised-but limited to urban interface. It often grows on roadsides. These 'less severe' Rubus species are a moderate competitor for light, but can cause mechanical damage to crop trees. Blackcap and Himalayan blackberry can sometimes create crown deformity or deformation of tree stems due to rubbing action from adjacent plants. Trailing blackberry is only a problem to our plantations in the early stage when the crop trees are less than 0.5 meter in height.

Butterfly Bush (Buddleja davidii) is a deciduous to semi evergreen shrub originally imported from China that readily establishes on disturbed sites. It can become a noxious weed and spread aggressively. Spreading rapidly by windburn

seed, butterfly bush displaces native vegetation in disturbed, open areas and along coastal forest edges, roadsides and especially on sunny steam sides and riverbanks. Butterfly bush is a prolific seed producer; a single flower cluster can produce over 40,000 seeds. Seeds are dispersed by wind and water and may remain dormant in the soil for many years. These shrubs also alter the nitrogen and phosphorous amounts in the soil, giving it an advantage that displaces native species, particularly in riparian areas. In forests, it competes with Douglas-fir tree seedlings. Butterfly Bush is listed as an invasive by the ISCBC.

Scotch Broom (Cytisus scoparius) is an escaped garden ornamental, common west of the Coast-Cascade Mountains in southwest BC and is concentrated at the southern end of Vancouver Island. Scotch broom spreads by seed and lateral bud growth, and mature plants can produce up to 3500 pods, each containing 5-12 seeds. As seedpods dry they split and spiral, expelling the contained seeds up to 5 metres. The plant can also spread to new disturbed areas through seed transport by vehicles and machinery. Due to its affinity for light-dominated, disturbed areas, any disturbance activity, such as road or home construction near infested areas, can enhance spread. Scotch broom invades rangelands, replacing forage plants, and is a serious competitor to conifer seedlings; Douglas fir plantation failures in Oregon and Washington have been credited to infestations of this plant.

Other competitor species: In addition to the species mentioned above, there are several other species that occasionally can present a problem. Herbaceous ground cover, thistle, swordfern and cottonwood are just a few of those, but other non-mentioned vegetation may become a problem on a site-specific basis.

2.3 Public Use

The logging road systems established and maintained by both industry and the Ministry of Forests, Lands and Natural Resource Operations and Rural Development allow for public access throughout the area. Deactivation of old road systems has limited the access to older harvested areas. Many of these older roads have become overgrown with vegetation and are no longer driveable. Recreational use on the logging roads to access the backcountry is moderate to high. Summer uses include hiking and backpacking, camping, biking, hunting, fishing, canoeing, berry picking, firewood cutting and motoring. Winter activities include, backcountry skiing, snowmobiling, snowshoeing and ice fishing. Public use of forest roads is expected to continue to increase in future years.

2.4 History of Vegetation Management

Trees have been planted on an operational basis for over 75 years in the Stillwater Valley. Stillwater Forest Operations has used a variety of treatment methods to control competing vegetation in the past decades. Prompt reforestation by planting immediately following harvest with vigorous seedlings (or site preparation) allows the new trees often to be established before competing vegetation becomes a concern. This is the key element of our Integrated Pest Management (IPM) program. The cornerstone of this approach is reliance on high quality seedlings and planting. Hence, as long as trees are planted promptly and have good survival, growth and vigour in the first 2-3 years, in most cases, seedlings will out-perform the competing vegetation. Faster early seral tree species such as red alder and broad-leaved maple will often still require treatment.

Table 2 shows the recent brushing history on the PMP area for TFL 39, Block 1. Manual brushing includes all non-herbicide treatments such as girdling, chainsaw, brush saw, and brushing with non-motorized hand tools.

Table 2: Brushing and Weeding History –TFL39, Block 1 from 2014-2019.

Year	Basal Bark (ha)	Manual Girdling (ha)	Manual Brushing (ha)	Total (ha)
2014	73	258	83	**414**
2015	51	74	107	**232**
2016	58	138	59	**255**
2017	105.6	79.6	103.8	**289**
2018	48.5	196.4	67.4	**312.3**
2019	0.0	76.7	53.4	**130.1**
Total	**336.1**	**822.7**	**473.6**	**1632.4**

Note: This PMP does not allow the use of aerial *herbicide* applications.

2.5 Herbicides used for Vegetation Controls

Historically, Stillwater Forest Operations has used the federally registered products Vision® and Vantage® (containing the active ingredient glyphosate) and Release® and Garlon® (containing the active ingredient triclopyr) in its vegetation control programs. Vision® and Vantage® are used as a foliar spray, while Release® and Garlon ® is used as a basal bark treatment mainly to control bigleaf maple coppices, but may also be used to control other hardwoods.

For the term of this PMP, we intend to use VP480®, Garlon XRT® and Garlon RTU®. S*urfactants* may be added to the herbicides to improve the effectiveness of the herbicide on some woody species. Currently the likely product to be used is Sylgard 309, which would enable *site preparation* treatments to better control bigleaf maple coppices.

All herbicide treatments will be consistent with the Integrated Pest Management Act, the Integrated Pest Management Regulation and the Pesticide Use Notice Confirmation. Any herbicides that will be proposed for use, within the scope of this PMP will be registered for forestry use under the Pest Control Products Act and have been deemed safe when applied according to label conditions. Only the *pesticides* listed below are intended for use under the terms of this plan, but product names may change over the duration of this PMP. Application rates and quantities are indicated on product labels. Lower rates and quantities will be used where project objectives may still be achieved.

Trade Name	Active Ingredient	PCP No.	Application Type
VP480	Glyphosate	28840	Ground (foliar backpack)
Garlon XRT	Triclopyr	28945	Ground (basal bark)
Garlon RTU	Triclopyr	29334	Ground (basal bark)

3. INFORMATION SHARING PROCESS

3.1 Record of First Nations Information Sharing

Three First Nations were notified of the Pest Management Plan by letter. Arrangements were made to either provide information or meet with representatives of each First Nation to describe the plan and solicit input.

The First Nations are:
Tla'amin Nation
shíshálh Nation
Klahoose First Nation

Annual notification regarding proposed treatments will be provided to the First Nations. Copies of the notification of intent to treat accompanied by maps will be delivered to the each First Nations.

A summary of meetings and/or input are provided as a Report in Appendix 9 in the final submission.

3.2 Record of Stakeholder and Public Consultation

In the preparation of this PMP, Stillwater Forest Operations carried out the following activities to share information with the public and other stakeholders:

- Published a legal notice of the 'Development of a Pest Management Plan' in the Powell River Peak newspaper on April 22nd and April 29th, 2020. These notices were published in accordance with the IPM regulation, and contained an invitation to view the proposed plan on line. All comments received from the public are included in the final submission (see Appendix 9).
- A presentation was made to the Community Advisory Group for TFL39, Block 1 on June 3, 2020. Many questions were asked and answered during the presentation, but no written comments were received.
- A letter was sent to the qathet Regional District (qRD) on April 21st to inform them of the proposed PMP and to invite them to provide comments. A written response was received and is included in the final PMP submission (see Appendix 8).
- Additional information was provided to the City of Powell River Councillors and qathet Regional District the via e-mail on July 22nd in preparation for their respective Council and Board meetings.

4. INTEGRATED PEST MANAGEMENT PROGRAM

Integrated Pest Management (IPM) is the key to the pest management program and incorporates the following concepts:

- Prevention - managing ecosystems to prevent organisms from becoming pests;
- Monitoring - ongoing monitoring of pest populations;
- Treatment - establishment of treatment thresholds and control of pests through direct intervention; and
- Evaluation - formal evaluations of treatment success.

The IPM approach uses all available, practical techniques to directly deal with pest problems, including biological, physical, and cultural controls, as well as chemical treatments. All activities are done in a co-ordinated manner balancing costs, worker safety and minimizing environmental impacts while achieving the final goal. Many actions are employed to prevent pest problems rather than simply treating them when they occur. Stillwater Forest Operations is committed to the principals and practice of Integrated Pest Management and will use the techniques listed below in an integrated program to manage competing vegetation.

Stillwater's vegetation management philosophy is to minimize herbicide use through prompt reforestation, and proactive plantation monitoring. We are committed to using alternate options providing that they are safe, and results and costs are comparable.

4.1 Prevention

Prevention is the key to a successful IPM program. The ideal situation would be to have the crop trees growing at their full site potential. Competing brush impedes tree growth and is costly to treat. A reforestation program that quickly establishes a new crop and is able to keep the trees growing at or near their potential is obviously the preferred scenario. The cost to new crop establishment is optimized and the use of herbicides is minimised. This perfect scenario is not achievable on all sites. Despite the best efforts, vegetation management will be necessary on some sites. The objective is to design the reforestation programs to maximize tree growth while minimizing the need for vegetation control. Preventative strategies will include, but are not limited to:

1. **Silviculture System -** The first step in the Integrated Pest Management program is the selection of the *silviculture system.* The choice of system – retention, clearcut, patch cut, etc. – impacts the manner and nature of regeneration, the method of harvesting, and the post harvest conditions of light, moisture and seed. All these factors can impact on the future levels of brush competition in the block. The selection of silviculture systems is usually predicated on other management objectives such as timber, *visual quality* or *biodiversity*, but the impact on regeneration success and future vegetation management is also taken into account.

2. **Ecosystem mapping -** The next step in the Integrated Pest Management program also occurs prior to harvesting and during the initial planning of the cutblock. Following the layout of the block by planners, a forester will identify and map the ecosystems and any pre-existing brush. The identification of the ecosystem is crucial. Certain species of vegetation are associated with certain ecosystems. The identification of those ecosystems with potential problem vegetation species or complexes at an early stage will help determine a regime of activities designed to control the competing vegetation in the most effective manner.

   Ecosystem mapping is done above all to determine the correct species to use for reforestation. The type of ecosystem is also useful for estimating, among other things, the potential for brush development following the harvest. For example, rich, moist sites will have a vigorous growth of species such as salmonberry or thimbleberry following the harvest; whereas poor, dry sites will often be sparsely vegetated for years after the harvest. Brush hazard estimates by ecosystem are included in the silviculture instructions (internal WFP plan) for each cutblock pre harvest. Four hazard ratings are used:

   - low – low vigour brush species – no vegetation management anticipated;
   - moderate – moderate vigour brush species – some vegetation management anticipated;
   - high – vigorous brush species – some vegetation management anticipated – possible multiple treatments;
   - very high – very vigorous brush species or pre-existing vigorous brush species – some vegetation management anticipated – possible site preparation required – possible multiple treatments.

Reforestation strategies are developed using many years of observations and experiences on similar sites. There is no set schedule of activities that will occur over a number of blocks. The regime is determined on a site-by-site ecosystem basis.

An assessment of brush hazard is the core for vegetation management decisions early in the block's history; these are correlated to the regeneration method that is chosen and the species and stock type of trees that are used in planting.

Low brush hazard areas may be left for natural regeneration or be planted with small *stock types* at lower densities (410, 412b container stock). Since there is little concern for competing vegetation slowing tree growth, the number of site visits is minimized with the confidence that the trees will reach free growing with little help.

On **moderate brush hazard areas**, there may be little concern for competing vegetation early in the stand establishment that would slow tree growth, and plantation monitoring is maintained to compensate for other seedling adversaries such as drought stress mortality, health and browsing. Brush management is likely to be necessary at later stage in stand establishment, for example to control deciduous tree species. Medium stock types are typically used (412A-415) and standard planting densities apply.

High and very high brush hazard sites will require more maintenance. Monitoring of seedling performance and brush competition is frequent (every 1-2 years as necessary). Brushing treatments are scheduled early in the plantation history. Multiple treatments are often necessary. Prompt establishment of crop trees on these sites will minimize the number of brushing treatments and herbicide use.

Strategies include using larger *stock types* (415D, 512A, container stock), fertilizing at the time of planting and using higher planting densities. Having a brush-hazard map is advantageous; it facilitates the identification of areas to focus monitoring early in the block's history and before the brush has overtaken the plantation.

In some areas covered by this PMP, there are a number of brush species that are well established before harvesting – this is called pre-existing brush. This pre-existing brush is noted in the silviculture prescription or plan, and a site preparation treatment may be proposed prior to planting on high brush hazard sites.

3. **Site preparation** is an activity that prepares the block for regeneration and reduces fire hazard. Site conditions that warrant site preparation include heavy pre-existing brush levels, heavy slash loading or compacted soils from logging operation. Roadside slash piling and burning is normal on most blocks. The types of site preparation that may be used are:

- Roadside slash piling or piling and burning (piles less than 50 m^2 in ground surface area may be left unburned);
- Off road slash piling or piling and burning;
- Ground foliar spray of pre-existing and emerging brush prior to planting;
- Ground foliar spray of pre-existing brush along existing roadways;
- Chainsaw cutting of openings in thick brush prior to planting;
- Broadcast burning
- Mounding or scarifying

4. **Planting** can have a large impact on future brush problems. Prompt, successful planting of healthy seedlings of the ecologically appropriate species and *stock types* can result in rapid growth of the seedlings and can result in the plantation outgrowing much of the competing brush. The various aspects of planting which are important are:

- Timing
- Planting prescription – species and stock type, size and age
- Planting density
- Planting quality

Note: Fertilization and browse guarding are most commonly implemented at the same time as planting but are discussed separately.

Timing

On brushy sites it is critical to plant as soon as possible after harvesting, ideally before the first growing season begins following harvesting. The exception is where site preparation is required first, planting will be delayed by one year. On low to moderate brush hazard sites prompt planting is less critical and may even be delayed to allow slash to settle on steep slopes and surrounding trees to seed in the block.

There are two windows for planting in the Sunshine Coast Forest District- the spring planting season and the late summer planting season. The preferred planting season for elevations below 600m is the spring, in fact the majority of the reforestation occurs during March and April. Earlier dates are too risky for snowfall, frozen ground and frost damage. Later dates are too risky for drought.

High elevation blocks usually retain snow until June. Planting on the high elevation blocks is sometimes delayed until late August or September because the ambient air temperatures are cooler and the risk of experiencing periods of drought have passed. The seedlings will establish roots shortly after planting and are ready for growth the following spring.

Planting prescription

The planting prescription is developed in conjunction with the site plan and the post harvest assessment. The prescription is based on the ecology and brush hazard of the site, and there is a different prescription for each ecosystem or group of ecosystems (standards units) in the block. The prescription details the species to be planted, the minimum *stock types* and sizes, the minimum density, and the minimum inter-tree distance. Experience has shown that larger stock types have better survival rates and initial growth rates. The size of planting stock used on a site will consider planting medium, existing and potential brush competition, moisture and nutrient availability and accessibility. Smaller stock types are sometimes necessary on sites with shallow or rocky soils. High brush competition areas will require the use of larger stock types to ensure good initial survival and growth. The quality of the planting stock is paramount in starting a vigorous plantation.

Planting Density

The target densities for commercially valuable crop trees at free growing generally range from 800-1000 stems per hectare. Most planting prescriptions specify a target planting density of 1000-1200 stems per hectare. This ensures that the targets are achieved and helps combat the anticipated brush; having a few extra trees allows for some mortality without requiring the more expensive and invasive option of brushing. Where natural regeneration is more prevalent and suitable (i.e., the hemlock and balsam are preferred species and brush is not expected to be a problem), lower planting densities are appropriate.

Planting Quality

The planting of seedlings is part science and part craft. Elevated, well-drained *microsites* are preferred for all species on most sites. Tree planters are taught to identify the best medium for the different species. Organic/mineral soil interface is generally ideal for all species, maximizing nutrient availability for the seedlings, although some species prefer organic soils. The root system has to be straight into the ground and to an adequate depth (root collar equal to soil surface). A well-planted tree located on a good microsite has a very good chance of survival and being able to out-compete brush on most sites; thereby, reducing the need for costly replanting and brushing. In all phases of the planting activity, stock handling is important to protect the quality of the seedlings.

Hardwood Management

Hardwood management is allowed under the current Forest Stewardship Plan (FSP). The stocking standards require 80% red alder stocking. It can be achieved by planting alder promptly following harvest completion or by converting failed confer plantations with full stocking of red alder to hardwood stocking standards.

Planting red alder is promoted if the following conditions are met:

- Rich to very rich soils
- Fresh to moist soils
- High to extreme brush hazard from alder
- Management challenges anticipated due to brush hazard and/or elk
- Logical future harvest opportunities
- No frost pockets
- Thin organic layers
- Low amounts of pre-existing brush

By proactively managing for red alder on ecologically suitable and high brush hazard sites, biodiversity on the landscape is promoted and brushing treatments are eliminated.

Stillwater Forest Operation currently has approximately 130 hectares of red alder plantations. Approximately 2800 ha of the forest land base in TFL 39 Block 1 is deciduous forest.

5. **Time-of-planting fertilization** – The use of 10g teabags containing fertilizer have been utilized by Stillwater Forest Operations over the last 18 years. Silviculture response appears to be positive for the first couple of growing seasons compared to controls. Both height growth and total biomass production are indicating positive results. More research is necessary on time-of-planting fertilization. We typically use time-of-planting fertilization on roadsides associated with harsh soil, and brushy sites.

6. **Browse Protection**

Mammals that browse on seedlings are common throughout the plan area. Blacktailed deer (Odocoileus spp.) are the most common culprit, but pika (Ochotona princeps) and elk (Cervus canadensis) are also capable of damaging plantations. Favourite browse species include western red cedar and yellow cedar. On high browse areas, all conifer species are browsed, including Douglas-fir.

Browsing results in the reduction in foliage and usually height growth, and in extreme cases can result in mortality. By using *browse control*, average height growth is maintained by reducing or preventing browsing, and therefore the crop trees have the ability to compete with brush species. This in turn reduces the amount of brushing required.

Browsing is minimized through a number of methods. In **low browse areas**, where browsing is considered to be light, no tree shelter will be used. Extra trees will be planted, to compensate for the potential losses to browsing. Planters will be instructed to take advantage of natural features such as slash or rock to camouflage the seedlings (obstacle planting). On **high browse areas**, where browsing is a concern for crop establishment, tree shelters may be installed over the planted trees. These protectors allow light and moisture to reach the trees but provide a physical deterrent to the mammal. The protectors are removed once the trees outgrow them. These protectors can significantly increase initial survival rates as well as allow the trees to maintain growth rates, reducing the need for treating competing vegetation. In recent years, browsing has been adequately managed by obstacle planting, even in the high browse areas.

4.2 Competing Vegetation or Pest

In this plan the term '**pest**' refers to any species of competing vegetation that causes unacceptable reductions in, or interferes with, the survival and growth performance of desired crop trees, as well as includes animals that browse or damage crop trees. Target species and vegetation complexes are described in Section 2.2. A good source for the identification of competing forest vegetation can be found in Plant Species of Coastal British Columbia (Pojar and MacKinnon 1994).

4.3 Monitoring

The monitoring phase of the integrated pest management program is crucial since it provides the information needed to make decisions about the timing and type of treatment.

There are two main strategies used to identify competing vegetation problems. The first is to predict where competing vegetation is likely to develop using ecosystem information (discussed in Section 4.1 - Prevention). The second method is information gathering during regularly scheduled field surveys. It is essential during surveys to be able to identify potential pests and to predict future impact on the crop trees. Data collected during regularly scheduled surveys is the main method used in evaluating vegetative competition. The following is a list of monitoring surveys that generally occurs throughout the establishment phase of a new timber crop. The frequency of the surveys depends on the brush hazard and other potential risks of the area.

Table 3: Monitoring Surveys used by Stillwater Forest Operations

Surveys	Timing	Information Gathered	
		Crop Tree	Competing Vegetation
Site Plan	Pre Harvest	Advance regeneration - sph, height, vigour	Species, cover, height- current and forecasted
Planting Prescription	Following harvest and before planting	Advance regeneration - species, sph, height, vigour	Species, cover, height
Survival - establish plots	6 months to 1 year following planting	Species, height, vigour, stocking	Species, cover, height, individual stem diameter and stem density of vegetation (if necessary)
Regeneration - either walkthrough or establish plots	One to six years following harvest	Total trees - species composition, height, vigour, sph Crop trees - species, vigour, wsph, height	Species, cover, height, individual stem diameter and stem density of vegetation (if necessary)
Stand Assessment	Six to eight years following crop tree establishment (may be more than one survey depending on the site)	Total trees- species composition, height, vigour, sph Crop trees - species, vigour, wsph, height, dbh	Species, cover, height, individual stem diameter and stem density of vegetation (if necessary)
Free Growing	Crop trees must meet minimum height requirements - usually 8- 20 years post harvest	Total tree - species, composition, height, vigour, sph Crop tree - species, vigour, wsph, height, dbh	Species, cover, height, individual stem diameter and stem density of vegetation (if necessary)
Post-Treatment Evaluation	1-2 years following treatment	Vigour, sph	Efficacy, density, assess need for more treatments

4.4 Treatment Thresholds

The Treatment Threshold is the point where the vegetation begins to limit the growth potential of the crop tree and vegetation management treatments should be done to ensure the tree grows at or near its maximum capacity. Treatment thresholds vary depending on the ecosystem and associated vegetation complexes. Determining thresholds is still largely through local knowledge and experience. Land Management Handbook number 28: A Field Guide for Site Identification and Interpretation for the Vancouver Forest Region (Green and Klinka 1994) is used to identify ecosystems and associated vegetation complexes. Based on ecosystem identification, a brush hazard rating can be predicted.

Many studies and monitoring of past treatments have shown that immediate treatment of competing vegetation, before it significantly impacts tree growth, is the best way to capture a site's growth potential. Frequent monitoring of plantations will ensure that brush treatments are scheduled at the optimum time to ensure continued good tree growth. It is anticipated that the preventative measures described in Section 4.1 will minimize the amount of brushing required. However, experienced forest professionals will prescribe brushing treatments when crop tree survival is threatened, or where competing vegetation is preventing crop trees from reaching free growing status. Treatments will generally be stratified to 0.5 hectares or greater, although smaller areas may sometimes be treated depending on specific values in a particular area.

4.5 Main Vegetation Management Options

For the term of this plan, there are two main treatment options that will be used to manage competing vegetation: Manual / Mechanical and Chemical. Following the results of a brush assessment, the forest professional will determine which method of brush control is the most appropriate. Considerations in selecting a method include:

- Target Vegetation
- Treatment Threshold
- Access
- Worker and Public Safety
- Neighbours
- Presence and location of water
- Effect on Fish and Water
- Presence and location of critical wildlife habitat
- Treatment efficacy
- Availability of workers
- Timing
- Cost of treatment

Table 4 outlines the manual vegetation management options including the efficacy, limitations and costs. Table 5 does the same for chemical vegetation management options.

Table 4: Mechanical / Manual Vegetation Management Options

Treatment Option	Mechanical Site Preparation (machinery)	Mechanical Cutting (hand power tools)	Manual (hand tools)	Manual Girdling (hand tools)
Scale of Treatment	• Upturning of vegetation and soil to improve survival and growth	• Can be very selective in what to treat	• Can be very selective in what to treat	• Generally red alder competition throughout the areas
Limitations	• Slope • Soils • Weather conditions • High cost • Equipment availability • Access • Skill of operator	• Low efficacy • High cost • Fire hazard • Damage to crop trees	• Mainly for herbaceous • High cost	• Stems >3cm *dbh* • High cost • Cannot be used along active roads • Snags an eyesore • Takes 1 year to have effect • Snags can damage crop trees when they fall
Target Vegetation	• All vegetation	• Shrubs, herbaceous and trees	• Mainly herbaceous	• Trees, mainly red alder
Efficacy & Benefits	• 2 years	• Immediate results • Often <1 year control • Multiple treatments likely • Non-herbicide control	• Herbaceous < 1 year • Woody stems and trees - 2-5 years • Non-herbicide control	• 3 or more years • Non-herbicide control • High efficacy
Equipment Required	• Appropriate machinery	• Chainsaws or brushsaws	• Hand tools	• Hand tools • Less skilled labour force
Worker Safety	• Worker protected in cab of machinery • Trained operator	• Physically demanding • Repetitive motion • Exhaust fumes • Dangerous tool • High injury rates • Skilled workforce	• Physically demanding • Repetitive motion • Dangerous tools • High injury rates • Less skilled workforce	• Physically demanding • Repetitive motion • Dangerous tools • High injury rates • Less skilled workforce
Public Safety	• Post signs that machinery is working in the area	• Increases fire hazard • Impacts mobility	• Increases fire hazard • Impacts mobility	• Snags falling down • Impacts mobility
Effect on Fish & Water	• No impact on fish as machine is restricted from fish sensitive zones • Possible increase in sedimentation until new vegetation has become established	• No impact if proper buffers maintained • Possible debris in water • Temporary reduction in thermal cover • Need to keep gas and oil away from contaminating water	• No impact if proper buffers maintained • Possible debris in water Temporary reduction in thermal cover	• Snags may fall into water • Temporary reduction in thermal cover • Retain appropriate buffers on critical streams
Effect on Wildlife	• Loss of forage • Alteration of habitat	• Debris may limit passage • Loss of berry crop • Re-sprouting provides good browse	• Debris may limit passage • Re-sprouting provides good browse	• Fallen snags may restrict passage • Reduces cover for nesting
Cost per Treatment	$1000 - 3000 / ha	$900 - 1800 / ha	$900 - 1200 / ha	$900 - 1600 / ha

Table 5: Chemical Vegetation Management Options

Treatment Option	Backpack Herbicide Selective	Basal Bark Selective
Active Ingredient	Glyphosate	Triclopyr
Scale of Treatment	• Ability to treat small pockets or selective around individual crop trees	• Treats individual stems - very selective
Limitations	• Height of brush • Smaller buffers • More worker training needed • Rain or wind • Narrow timing window	• PFZ's on all watercourses wet or dry will require manual treatment • No buffers needed • More effective on smaller stems • More worker training needed • Rainy weather • Snags an eyesore
Target Vegetation	• Herbaceous, shrubs and trees < 2m	• Trees
Efficacy & Benefits	• 2-4 years • Fair brush control for several years	• 2-4 years • Can be very selective in what species to treat
Equipment Required	• Low pressure backpack sprayer with possible cone attachment for protecting seedlings • Varying application rates and dosages possible	• Low pressure backpack sprayer with adjustable nozzles • Spray bottle • Varying application rates and dosages possible
Worker Safety	• Proper procedures to be used in minimizing exposure to herbicide • Trained workers • Proper safety gear • Standard Operating Procedures	• Proper procedures to be used in minimizing exposure to herbicide • Trained workers • Proper safety gear • Standard Operating Procedures
Public Safety	• Signs posted notifying public of the treatment areas • PFZ's and buffers established	• Signs posted notifying public of the treatment areas • PFZ's established
Effect on Fish & Water	• Pesticide Free Zones along watercourses will ensure no impact	• Pesticide Free Zones along watercourses will ensure no impact
Effect on Wildlife	• Partly reduced forage and browse in short term • Minor changes in habitat may affect some species in the short term	• Changes in habitat may affect some species in the short term • Reduced cover for nesting • More open forest
Cost per Treatment	$700 - 1400 / ha	$560 - 1300 / ha

4.6 Treatment Selection

The decision to treat vegetation is based on the treatment thresholds discussed earlier. A brush species is not considered to be a hazard if it is not significantly impacting crop tree growth. However, the same brush species on a different site can dominate the growing space and greatly impact the growth potential of the crop trees. In practice, several other factors will affect the decision-making process. (Weather, season, bodies of water, vegetation complex, cost, availability of crew, etc.)

Table 6 is a guideline used to select the optimum vegetation management treatment for an area for the main competitor species. Treatments may be combined or modified according to the Detailed Site Assessment for the area.

Table 6: Vegetation Treatment Selection Guideline

Target Species	Target Vegetation Characteristics	Competition Severity	Considerations	Recommended Treatment
Red Alder	All	L-M		Girdling or Cutting
	1-8 cm dbh	H-VH		Basal Bark
	<2m in height	H-VH	Very few streams	Foliar backpack selective
Bigleaf Maple	<3 coppiced stumps/ha	L		Cutting
	>2 coppiced stumps/ha	M-VH		Basal Bark
	<2m in height	M-VH		Foliar backpack selective
Thimbleberry, Salmonberry, Elderberry & mixed shrub complexes	All	M-VH	PFZ's, high fisheries values, critical wildlife values, many creeks, cultural significance,>2m in height	Cutting
	<2m in height	M-VH	Frequent watercourses, high wildlife or fisheries values	Foliar backpack selective
Bracken	All	M-VH		Hand tools
Fireweed	All	M-VH		Hand tools

4.7 Post Treatment Evaluation

As part of our monitoring program, all brushing treatments are evaluated one to two years following treatment to examine efficacy. This is usually done by a walkthrough assessment. This feedback is incorporated into the decision-making process for future treatments on similar stands. Post Treatment Evaluations assess the following:

- Effectiveness of the treatment relative to the prescription objective
- Unintended impacts; e.g. herbicide damage to crop trees or cut seedlings
- Need for further treatment
- Does the stand meet the free growing objectives?

5. ENVIRONMENTAL PROTECTION

5.1 Community Watersheds and Water Intakes

There are three Community Watersheds in TFL39, Block 1: Haslam-Lang, Silver, and Jefferd Creek. Community Watersheds will not receive any herbicide treatments within their boundaries, and any vegetation management will be conducted using non-herbicide methods.

All licensed domestic water intakes will receive a minimum 30m no-treatment zone for herbicides. All registered water licence holders within 200m of any treatment sites will be notified prior to the application of any herbicides.

5.2 Fish and Wildlife, Riparian Areas and Wildlife Habitat

Fish and wildlife resources and riparian areas will be protected and managed according to the Pesticide Application Practices in section 6.7.

5.3 Species Requiring Protection

The list of red and blue (endangered or threatened) listed plant species possibly located in the forest ecosystems of the plan area can be found on the following link: http://a100.gov.bc.ca/pub/eswp/. It is during the pre-harvest assessment (site plan preparation) of an area that any impacts on endangered and threatened organisms and communities is considered and managed for.

Stillwater foresters will seek direction from the MoE in regards to managing and protecting threatened or endangered species.

We are aware of berry, mushroom and salal picking activities by the public in our forests. Herbicide use signs will be posted for at least 14 days on all areas where herbicide applications have taken place.

5.4 Biodiversity Considerations

Biodiversity at the landscape level is managed through the landscape unit planning process. This has been completed for TFL39, Block 1, and identifies the Old Growth Management Areas.

Biodiversity at the stand level is managed through retention of wildlife tree retention areas, and other constrained areas (e.g. riparian reserve zones). Every block with a Silviculture Prescription or Site Plan approved since June 15th, 1995 is required to retain permanent reserves within or adjacent to the harvest opening. Generally, wildlife tree retention areas contribute to biodiversity by providing, among other things, a legacy of the previous stand (lichens, insects) and by providing vertical structure to the forest. These features are generally unaffected by vegetation management activities.

Forest plantations are seldom established using only one species. As much as is ecologically possible, more than one species is added to the planting mix. Combined with the natural trees that will also regenerate alongside the planted trees, it ensures a good diversity of tree species in future forests.

6. OPERATIONAL PRACTICES

All operations will be carried out in accordance with the Integrated Pest Management Act and Regulation, other relevant legislation, authorities and guidelines in Appendix 2, and Western Forest Products ISO certification. In the case of conflicting procedures in any documents the Integrated Pest Management Act and Regulation will be adhered to.

6.1 Qualifications of Personnel

This plan was developed by a Registered Forest Professional. Technical or professional personnel with at least 2 years of experience in silviculture surveys and/or brushing and weeding will carry out the pre and post-treatment field assessments. Final approvals regarding treatment areas and methods will be made by, or under the supervision of, a Western Forest Products employee whose name will be indicated on the Detailed Site Assessment.

All pesticide treatments will be done by, or directly supervised by, applicators certified by MoE in the appropriate applicator category. Brushing and weeding contractors applying herbicides under this plan will be contractually obligated to have a valid BC Pesticide Service Licence in the Forestry category and to have a working knowledge of the following:

- This PMP and its conditions
- The project prescription
- Western Forest Products *Environmental Management System*
- The Material Safety Data Sheets for any herbicides used
- Training in the safe application of pesticides
- Spill Plan Procedures and Reporting

6.2 Pesticide Handling Practices

6.2.1 Pesticide Transportation

All herbicide products will be transported in accordance with the Transportation of Dangerous Goods Act, the Integrated Pest Management Act and Regulations and with adherence to the precautions listed in Chapter 5 of the Handbook for Pesticide Applicators and Dispensers (Adams, 1987). Measures taken to ensure the integrity and safety of herbicides in transit will include:

- Pesticide containers will be secured during transit and placed in locked compartments when vehicles are left unattended
- Pesticides will be carried separately from food, safety gear, and people – i.e., in the back of a pickup truck and not in cars or station wagons
- Pesticide containers will be inspected prior to departure for damage or leakage
- Pesticides will not be transported on wooden truck boxes. If the truck has a wooden deck use a storage box made of non-absorbent material.
- Pesticides will be transported with a spill kit (shovel, absorbent pads), and the driver will be trained in emergency spill procedures
- Provided the volume of pesticide is less than 5000 litres no placards or documentation is required during transport, but the MSDS should be accompanying the pesticide
- Personal protective equipment and personal first aid equipment shall be carried in a closed compartment separate from the herbicide containers

6.2.2 Pesticide Storage

Herbicides will be stored in accordance with the Integrated Pest Management Act and Regulations. All herbicides will be stored in rooms, sheds or lockers that are locked and secured when unattended, vented to the outside and only accessed by those with authority to do so. Warning signs indicating, 'Warning-Chemical Storage Area-Authorized Persons Only' will be posted on all entrances. Storage is not permitted within the greater of 50 metres or the extent of the riparian management areas.

6.2.3 Mixing and Loading Pesticides

Mixing and loading operations will be conducted as per the instructions contained on page F-2 of the Herbicide Field Handbook (Boateng 2002) and Chapter 5 of the Handbook for Pesticide Applicators and Dispensers (Adams, 1987)..

6.2.4 Container and Unused Pesticide Disposal

The contractor shall be responsible for all container and residual pesticide disposal. All 115 litre empty pesticide containers (shuttles) shall be returned to the manufacturer for re-use. Other empty herbicide containers will be triple rinsed, and the containers crushed or slashed before being taken to an approved landfill or recycling depot.

6.2.5 Spill Response Plan

A spill kit will be maintained at mixing and loading sites. Contactors will adhere to WFPs Spill Reporting Standard which will be reviewed with applicators and mixing/loading personnel prior to the start of each project. A copy of the Spill Report Form is included in Appendix 3.

6.3 Boundary Layout Procedure

All treatment boundaries (where required), no-treatment zones, pesticide-free zones (PFZs) and/or associated buffers will be clearly identified prior to treatment with high visibility flagging tape placed at a height and density that are clearly visible to applicators. This will be completed as close to the time of treatment as possible. Where the treatment boundary coincides with the harvest boundary, or other natural boundary features no flagging is required. Only a single line of ribbon is necessary where there is a combined PFZ and buffer. Additional flagging may be used to identify specific treatment areas but this is not mandatory – a standard colour is not specified. For ground foliar treatments, flagging tape, of a colour that does not conflict with the treatment boundary ribbon, may be hung to identify application corridors and ensure applicators obtain necessary coverage levels.

Tools such as GPS, or compass and hipchain will be used to accurately map treatment boundaries on the project maps.

6.4 Equipment Maintenance and Calibration

The contractor is responsible for all equipment maintenance and calibration. All equipment used for the application of herbicides shall be calibrated and maintained on a regular basis. The contractor shall maintain a log of all equipment maintenance and calibration. For herbicide applications, backpack sprayers with pressure control and adjustable spray nozzles will be used. Prior to start up of a new contract, equipment will be calibrated to confirm that the types of devices and the settings to be used will achieve the target application rates.

All conventional backpack spray equipment shall:

- Have a positive shut-off nozzle
- Be a sealed non-leaking container
- Have an extension wand for nozzle
- Have a pressure limiting valve
- Have a spray screen
- Have a loading screen in the filler cap

In addition, conventional backpack spray equipment for the application of Release or Garlon shall:

- Have a positive shut-off nozzle at the end of the wand
- Have a pressure-limiting valve set at 5 psi.

Calibration of *basal bark* application devices will be on a stem-specific basis to ensure that target application rates are accurately achieved.

For calibration checks on backpack spray equipment, the following steps will be taken on sample backpacks prior to commencement of treatment. Water with dye will normally be used for calibration purposes.

- Check to ensure correct nozzle is installed
- Partially fill the sprayer with clean water
- Pump to correct pressure
- Check for leakage
- Spray sample cards to check for droplet pattern
- Measure effective swath width
- Fill sprayer with known quantity of water
- Spray small homogeneous area of known length and width at the desired speed and pressure
- Measure volume of water remaining in the sprayer
- Calculate the litres used and determine output in litres per hectare
- If needed, adjust speed of travel or pressure to provide target application

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

6.5 Pesticide Notices

Signs giving the public notice of herbicide treatments will be placed prior to project commencement at the permanent access points of treatment areas or at a location on a highway so that they are clearly visible and legible to a member of the public accessing the approaches to the treatment area. The notices will remain in place for at least 14 days after completion of work. The signs must be constructed of water-resistant materials and mounted on solid objects (trees, posts, permanent log piles) and be fastened so that they will not come off in a strong wind (nails, staples or strong binding). The notices will conform to section 63 of the Integrated Pest Management Regulation, and will list such information as:

- Trade names or active ingredients of the pesticides that will be used
- Date and time of application
- Precautions to be taken to prevent harm to people entering the treatment area
- Confirmation number; address, phone number and contact person to obtain additional information about the pesticide or pesticide use.

6.6 Weather Monitoring

An anemometer, thermometer, and when appropriate, relative humidity measurement equipment will be used at the treatment sites before and during foliar applications to ensure weather conditions are suitable for herbicide application. These readings will be taken and recorded at the start of each application and every three hours after during the application unless weather conditions change and a more frequent schedule is appropriate. Foliar treatments will only be carried out when:

- Temperatures are less than 30 degrees Celsius
- Wind speed is less than 8 km per hour
- Relative humidity is greater than 30%
- Vegetation is dry to nearly dry
- No precipitation is likely within 3 hours of an application of glyphosate.
- Wind is not blowing in the direction of environmentally sensitive area**s**

If all of these conditions are not met the operations will be suspended until conditions are acceptable.

Basal bark applications shall be stopped in periods of rain or snow that prevents the product from being applied effectively according to the manufacture's label. Application will cease when stem flow of water is occurring or is likely to occur.

6.7 Pesticide Application Practices

6.7.1 General

Silviculture contractors perform all pesticide applications on behalf of Stillwater Forest Operations. Prior to any type of herbicide application, the Stillwater Forest Operations supervisor or delegate will ensure that the contractor adheres to the Pesticide Application Practices, Western Forest Products EMS requirements, and the requirements of this PMP, which includes the following:

- A pre-work meeting will be held with the Stillwater supervisor, the contractor supervisor and the contractor crew. Stillwater Forest Operations will provide a work plan that includes emergency numbers, a spill contingency plan, application parameters, project details, application rates, maps and other work instructions.

- The contractor supervisor shall ensure that the application crews are familiar with the plan, instructions, block layout, and the safe handling of pesticides including purchasing, mixing, applying and disposing of containers.

- Ensuring all workers are equipped with appropriate safety gear and protective equipment.

- All pesticide use shall be carried out by or under the direct supervision of an individual with a valid British Columbia Pesticide Applicator Certificate in the forestry category. The certified applicator must not supervise more than four uncertified individuals who perform the work. The certificate of the supervisor must be at or near the treatment area during the pesticide use. The certified individual must be no more than 500 meters from, and maintain continuous visual or auditory contact with each person being supervised.

- During pesticide use, pesticide applicators shall possess maps of sufficient detail that accurately show the area where pesticide use is authorized and accurately describe the location of any water intakes and water bodies that could potentially be impacted by pesticide use. These maps shall contain the location of anticipated pesticide-free zones and buffers that are needed to protect water quality.

- Adequate buffer zones shall be established to protect all pesticide-free zones. The boundaries of all buffers shall be clearly marked before pesticide use commences. All boundaries shall be inspected to ensure that all layout conforms to standards in the PMP and the IPMA regulation.

- Pesticides shall be used according to label directions.

- Ensuring that spray equipment is calibrated and the correct droplet size is selected.

- Pesticides shall not be applied to vegetation that has water flowing off its foliage or down its stem.

- *Ground foliar* pesticide use is limited to the foliage within 2.5 metres of the ground. Foliar pesticide use shall only be used when wind speeds are less than 8 km/hr and the air temperature is less than 30°C. The contractor supervisor, and the Stillwater Forest Operations supervisor on sensitive sites, will monitor drift to ensure buffers are adequate.

6.7.2 Water Quality Protection

- All *streams* within or directly adjacent to the proposed pesticide use area must be clearly mapped with stream classification and wet or dry sections delineated before pesticide use.

- Except for the use of glyphosate, a 10 metre (horizontal distance) pesticide-free zone shall be established upland from the high water mark of all bodies of water, wet and dry streams, and classified wetlands and lakes.

- For applications of glyphosate, a minimum 2 metre (horizontal distance) pesticide-free zone shall be established upland from the high water mark of all bodies of water and classified wetlands if it is not fish bearing at any time of the year and *selective application* methods are used between 2 m and 10 m above the high water mark.

- Glyphosate may be applied to a dry stream bed if the dry stream is not a wildlife habitat feature and is not fish bearing when wet.

- A pesticide-free zone is not required for the use of glyphosate if no glyphosate is applied below the high water mark and the body of water is:

    - A temporary free-standing body of water (e.g. a puddle in the ditch);
    - Not a classified wetland nor a wildlife habitat feature;
    - Not fish bearing and does not drain into a fish bearing body of water within 100 m

- Pesticide-free zones must be protected by an appropriate buffer to ensure the integrity of the PFZ.

- Pesticides shall not be directly applied to areas of temporary freestanding water (water that does not drain into stream, lakes or wetlands).

- Pesticides shall not be used within 30 metres (horizontal distance) of domestic or agricultural water intakes or wells.

- Pesticides shall not be used in seepage areas that are greater than 20 metres by 20 metres in size, that are dominated by wetland plant communities or, that are otherwise unlikely to support crop trees.

6.7.3 Wildlife Habitat Protection

- Pesticides shall not be used within the riparian-reserve zone of any water-body unless authorized in writing by a designated environment office per the Forest Planning and Practices Regulation – Forest and Range Practices Act.

- Wildlife tree patches or retention areas (as defined in the Forest Practices Code of British Columbia Act-Operational Planning Regulation and the Forest Planning and Practices Regulation – Forest and Range Practices Act) shall be identified prior to pesticide use.

- Pesticide use shall comply with additional restrictions detailed in any applicable Known Ungulate Winter Ranges, Wildlife Management Areas, Operational Plans or Higher Level Plans established under the Forest Practices Code of British Columbia Act and the Forest and Range Practices Act.

6.7.4 Monitoring and Recording

- The contractor supervisor will ensure that accurate records of equipment calibration, herbicide use and weather conditions are kept. Western Forest Products will keep these Herbicide Operation Records for a period of three years. Forms for herbicide operations record keeping can be found in section D of the Herbicide Field Handbook, (J.O. Boateng)

- Pesticide spills that result in impacts not authorized by or consistent with this plan shall be immediately reported to the Provincial Emergency Program at 1-800-663-3456. Spill affected areas shall be immediately cleaned-up and decontaminated. The Deputy Administrator shall be provided with reports on the spill, clean-up activities and decontamination actions as soon as practicable.

- If the confirmation holder believes that the confirmation holder or another person has contravened the Integrated Pest Management Act and Regulation in a manner involving the release of pesticide into the environment, the confirmation holder must give written notice to the administrator as soon as practicable after forming the belief.

7. IMPLEMENTING THE PMP

7.1 Pesticide Use Notice

A pesticide use notice will be submitted to the Administrator of the Integrated Pest Management Act and regulation upon completion of the PMP and information sharing process. The pesticide use notice will contain the following information:

- The name and the business address of the applicant;
- The type and the use of pesticide to which the notice pertains;
- A description of the geographic boundaries of the area to which the pesticide use notice relates;
- A list of the active ingredients of the pesticides proposed for use;
- A statement of whether aerial application of pesticide is intended;
- The name and contact information of the principal contact person for information relating to the PMP;
- The term of the PMP and the appropriate fee.

7.2 Public Consultation

In accordance with the Integrated Pest Management Act and Regulation public consultation must be conducted in the preparation stages of developing this PMP. Consultation included newspaper notices (see Appendix 6 and Appendix 9) in the Powell Peak Newspaper over a 2-week period and reasonable efforts to contact and consult with individuals or groups who have the potential to be significantly impacted by the proposed pesticide use.

7.3 Notices of Intent to Treat (NITs)

Stillwater Forest Operations will submit an annual "Notice of Intent to Treat" to the Administrator and to the relevant First Nations at least 21 days prior to the planned treatment commencement date. Pesticide use shall be for the purposes listed in the Notice of Intent to Treat and shall be primarily directed towards control of the competing brush species listed in the Detailed Site Assessment. An example NIT is included in Appendix 5. The NIT will include:

- The name and business location of the confirmation holder
- A description of the proposed treatment locations for the calendar year and a map or diagram that clearly identifies those locations.
- A description of the proposed treatment for each area, including the pesticide to be used and its method of application; and
- The total area of treatment areas in the proposed treatment locations for the calendar year.

7.4 Detailed Site Assessments

A Detailed Site Assessment or DSA will be prepared for each block requiring the use of herbicides (see Appendix 4). It will be completed prior to treatment, signed by a Registered Forest Professional and will be available for inspection by the Administrator of the Integrated Pest Management Act and the general public upon request. The DSA will include the following information:

- Block identification (block name, tenure, CP number, stratum)
- Site characteristics
- Treatment(s) selected
- Crop tree and competing vegetation data,
    1. *Stocking* by species
    2. Average height and age of crop trees
    3. Target vegetation (% cover or density and average height)
    4. Average diameter of broad-leaved target species
- *Waterbodies*, watercourses and *wetlands* along with their *FRPA* classification
- Fish habitat presence, and required protection measures
- Wildlife habitat and biodiversity considerations and protective measures
- Red and blue listed plant communities, and measures to protect them if present in the cutblock.
- Community watersheds or water intakes within 200m of the proposed treatment site

- Other identified resource use associated with the site
- Herbicide prescription details:
    1. Treatment method and area
    2. Pesticide trade name and PCP no.
    3. Application rate (litres active ingredient/ha)
    4. Quantity of active ingredient
- Notification Requirements (if required)

7.5 Detailed Site Assessment Maps

A DSA will have an overview map and a 1:5000 treatment map. The overview map may show the location of one or more treatment sites and the access routes. Pesticide use is approved for the locations within the general plan area but specific to the locations denoted on the Detailed Site Assessment maps. The treatment maps will include:

- Legend, North arrow and Scale of 1:5000
- Date of Production
- Road locations
- Watercourses, lakes and wetlands with FRPA classification
- Environmentally sensitive areas
- Residences and communities near treatment sites (if applicable)
- Location of potable water intakes or wells within 200m from the treatment area
- Treatment boundaries, e.g. The location of proposed herbicide treatments within the block boundaries.
- Proposed locations of *pesticide free zones* (PFZ) and/or *buffer zones*, and selective treatment zones (these may be adjusted depending on the conditions at the time of treatment)

7.6 Annual Reporting

For each year the PMP is in effect, an Annual Report for Confirmation Holders will be submitted to the Administrator. The report is due by January 31st for activities completed in the previous calendar year. It can be found at https://www2.gov.bc.ca/assets/gov/environment/pesticides-and-pest-management/business-and-industry/ann_rep_pest_confirm_holders_cp.pdf. The report will contain the following information for each site treated during the calendar year:

- Name and address of the confirmation holder and the confirmation number;
- For each pesticide used in the calendar year, the trade name, registration number, active ingredient, name(s), and amount of pesticide product used in kilograms; and

If pesticides were used on more than 20 hectares of public forest land in that year an Annual Follow-Up Report will also be submitted (see Appendix 7) containing the following additional information :

- A description of the treatment location and a map identifying its treatment boundaries;
- The methods used to apply pesticide;
- The total area treated and total area treated with each pesticide used; and
- Methods of non-pesticide pest controls used and the estimated total area of their use.

GLOSSARY

Allelopathy *The ability of some plant species to exclude other plant species through the exudation of chemical toxins.*

Basal bark *Application of the herbicide Release® onto the bark at the base of tree stems.*

Biodiversity *The diversity of plants, animals, and other living organisms in all their forms and levels of organization, including genes, species, ecosystems, and the evolutionary and functional processes that link them.*

Biogeoclimatic *A system of ecosystem classification used in British Columbia to describe forest ecosystems; forest classification based on climax vegetation*

Blowdown *Trees knocked over by wind; usually in a patch or along block boundaries*

Broadcast foliar *Uniform spraying of a herbicide over a contiguous area*

Browse control or browse guarding *Actions employed to limit eating of crop trees by deer, elk or pikas by using cones, cages, fencing or repellents*

Buffer zone *Area of no direct pesticide application designed to ensure that a PFZ or sensitive area remains pesticide free*

Conifer *Trees with cones; most Coastal species are evergreens*

Coppices *Re-growth that arises from the stumps of some species of trees*

CWH dm *Coastal Western Hemlock – Dry Maritime*

CWH vm1 *Coastal Western Hemlock – Submontane Very Wet Maritime*

CWH vm2 *Coastal Western Hemlock – Montane Very Wet Maritime*

CWH xm *Coastal Western Hemlock – Very Dry Maritime*

Deciduous *Tree species that lose their foliage in the fall*

DBH *Diameter at breast height*

Ecosystem *A functional unit consisting of all the living organisms (plants, animals, and microbes) in a given area, and all the non-living physical and chemical factors of their environment, linked together through nutrient cycling and energy flow. An ecosystem can be of any size-a log, pond, field, forest, or the earth's biosphere-but it always functions as a whole unit. Ecosystems are commonly described according to the major type of vegetation, for example, forest ecosystem, old-growth ecosystem, or range ecosystem.*

Environmental Management System (EMS) *A continual cycle of planning, implementing, reviewing and improving the processes and actions that an organization undertakes to meet its business and environmental goals. Most EMS's are built on the "Plan, Do, Check, Act" model.*

Free growing *Generally means a stand of trees that has adequate stocking levels and the trees are free of competing vegetation. Free growing stocking standards are defined for each individual standard unit.*

Ground foliar *Application of a herbicide to foliated vegetation using backpack sprayers*

Herbicide *A pesticide used to control or manage vegetation*

Integrated Pest Management

A decision-making process that uses a combination of techniques to suppress pests and that must include but is not limited to the following elements:

a) planning and managing ecosystems to prevent organisms from becoming pests
b) identifying potential pest problems
c) monitoring populations of pests and beneficial organisms, pest damage and environmental conditions
d) using injury thresholds in making treatment decisions
e) reducing pest populations to acceptable levels using strategies that may include a combination of biological, physical, cultural, mechanical, behavioural and chemical controls, and
f) evaluating effectiveness of treatments

Mechanical damage

Scarring or deformation of tree stems due to snow, wind and rubbing action from adjacent plants

MHmm1 *Mountain Hemlock-Windward Moist Maritime*

Microsite *A small area, which exhibits, localized characteristics different from the surrounding area. For example, the microsites created by a rock outcrop with thin soils, or the shaded and cooled areas created on a site by the presence of slash.*

Niche *The way of life of an organism, which gives it a special place and function in the environment.*

Pest *In this plan the term '**pest**' refers to any species of competing vegetation that causes unacceptable reductions in, or interferes with, the survival and growth performance of desired crop trees. It also includes animals that browse or damage crop trees.*

Pesticide *Under the B.C. Pest Control Act, any substance or mixture of substances, other than a device, intended for killing, controlling or managing insects, rodents, fungi, weeds and other forms of plant or animal life that are considered to be pests.*

Pesticide Free Zone

(*PFZ) An area of land that must not be treated with pesticide and must be protected from pesticide moving on to it.*

Pest Management Plan

A plan that describes: (a) a program for controlling pests or reducing pest damage using integrated pest management, and (b) the methods of handling, preparing, mixing, applying and otherwise using pesticides within the program.

Rhizome *Root-like structure that grows parallel to the ground just beneath the surface; new shoots will often grow from it*

Seedbank *Natural seeds stored in or on the forest floor that could germinate if conditions are favourable*

Selective application
The application of a pesticide to individual plants so that the vegetation between individual plants is not treated. (BC MoE, 2005)

Silviculture *The art and science of controlling the establishment, growth, composition, health and quality of forests and woodlands. Silviculture entails the manipulation of forest and woodland vegetation in stands and on landscapes to meet the diverse needs and values of landowners and society on a sustainable basis.*

Silviculture system
A planned program of treatments throughout the life of the stand to achieve stand structural objectives based on integrated resource management goals. A silviculture system includes harvesting, regeneration and stand-tending methods or phases. It covers all activities for the entire length of a rotation or cutting cycle.

Site preparation *The treatment of the soil and ground vegetation to prepare the soil surface as a favourable seedbed for either naturally or artificially disseminated seed or for planted seedlings.*

Sph *Stems per hectare*

Stocking *The amount of trees on an area. Usually expressed as stems per hectare (sph)*

Stock type *The type and size of the tree seedlings prescribed for reforestation*

Stream *A watercourse, including a watercourse that is obscured by overhanging or bridging vegetation or soil mats, that contains water on a perennial or seasonal basis, is scoured by water or contains observable deposits of mineral alluvium, and that has a continuous channel bed that is 100m or more in length or flows directly into a fish stream, a fish-bearing lake or wetland, or a licensed waterworks.(BC MoE, 2005)*

Surfactant *A chemical or agent used in a herbicide to make mixing easier and to assist in the spreading of a chemical and the wetting of and adherence to the surface to be treated, e.g. emulsifiers, soaps, wetting agents, detergents and spreader stickers.*

Thinline *Basal bark application of the herbicide Release®, at a concentration of 100%, to the stem of Big-leaf maple using a squirt bottle*

Vegetation management
Reduction or removal of deciduous plants competing for light or other resources with crop trees

Visual quality *The subjective assessment of the aesthetic impact of forest management on scenery*

Waterbodies *Streams, lakes, and wetlands*

Wetland *A swamp, marsh, bog or other similar area that supports natural vegetation that is distinct from upland areas. A **classified wetland** is a wetland referred to as having a class W1, W2, W3, W4 or W5 under the Forest Planning and Practices Regulation. (BC MoE, 2005).*

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Appendix 1

PMP OVERVIEW MAP

Appendix 2

Relevant Legislation, Authorities and Guidelines

Federal Legislation, Authorities and Policy

Pest Control Products Act
Pesticides sold and used in Canada must be registered under this act and be assigned a Pest Control Products Act number by the Pest Management Regulatory Agency (PMRA). In order to receive registration, products must submit scientific data and have it reviewed by the PMRA and its advisory agencies (e.g. Health Canada, Environment Canada, Fisheries and Oceans Canada, and Agriculture Canada). Data required for submission includes:

- Physical and chemical properties of the active ingredient(s);
- Short and long term toxicology studies, including those on teratogenicity, mutagenicity, carcinogenicity, and potential reproductive effects;
- Acute oral, dermal, inhalation, skin, and eye irritation effects;
- Potential environmental impact, including effects on mammals, birds, aquatic organisms, microorganisms, and insects;
- Effectiveness data.

Results of these reviews are used to help craft label directions; it is a legal requirement that these be followed by pesticide applicators. The PMRA keeps current with new data obtained from any studies conducted after product registration to help ensure that conditions for its use remain appropriate. Formal registration reviews are also periodically conducted.

Fisheries Act
Two sections of this act are relevant to pest management programs. It is an offense to:

- Harm or destroy fish habitat;
- Deposit or permit the deposition of a harmful substance into waters containing fish.

Transportation of Dangerous Goods Act
The TDG Act regulates the transportation of hazardous quantities of toxic materials and may require the use of shipping documents, warning placards, and appropriate safety procedures. This act is not normally relevant for the shipping of most herbicides because of their relatively low toxicities.

Provincial Legislation, Authorities and Policy

Integrated Pest Management Act and Regulation
This legislation provides for provincial authority to regulate the sale, use, transportation, storage and disposal of pesticides in British Columbia. The Integrated Pest Management staff of the Ministry of Environment administers the act and supporting regulations from regional offices around the province. Pesticide Use Permits and Pest Management Plans are issued or approved under this legislation. It also makes provision for training and certification of pesticide applicators and dispensers, as well as licensing of service and vendor companies.

Pest Management Plans are defined under this legislation to describe:

- A program for controlling pests or reducing pest damage using integrated pest management;
- The methods for handling, preparing, mixing, applying and otherwise using pesticides within the program.

Integrated Pest Management (IPM) is defined in the same legislation to mean “a decision making process that uses a combination of techniques to suppress pests and must include but is not limited to the following elements:

- Planning and managing ecosystems to prevent organisms from becoming pest;
- Identifying potential pest problems;
- Monitoring populations of pests and beneficial organisms, pest damage, and environmental conditions;
- Using injury thresholds in making treatment decisions
- Reducing pest populations to acceptable levels using strategies that may include a combination of biological, physical, cultural, mechanical, behavioral, and chemical controls;

- Evaluating effectiveness of treatments."

Forest Practices Code of British Columbia Act, Regulation and Guidebooks

The Forest Practices Code (FPC) is a comprehensive statute that governs forest practices in the province. It contains provisions for high level and operational planning, direct forest practices, and penalties for non-compliance. The Silviculture Practices Regulation under the Code contains specific requirements for pesticide applications in community watersheds. Code-related guidebooks used to provide direction for forest pesticide use include the Site Preparation Guidebook, the Riparian Area Management Guidebook, the Biodiversity Guidebook and the Community Watershed Guidebook.

Forest and Range Practices Act

The Forest and Range Practices Act (FRPA) updates the FPC with results-based provisions. The Timber Harvesting and Silviculture Practices Regulation (THSPR) replaces the Timber Harvesting and Silviculture Practices Regulation. The Operational Planning Regulation is replace by the Operational and Site Planning Regulation (OSPR). FRPA encompasses similar obligations as the FPC but does not require authorities to approve Silviculture Prescriptions. Instead, Site Plans are maintained in Licensee files and are subject to audits.

Workers Compensation Act and Industrial Health and Safety Regulations

The act and regulations are designed to ensure workers have a safe workplace and are protected from hazards associated with their jobs. The regulations covering applications of pesticides require that workers have adequate protective clothing/equipment, wash facilities, equipment maintained in good working order, and the information needed to use the products safely.

Waste Management Act and Supporting Regulations

The Waste Management Act governs the introduction of wastes to the environment and through the Special Waste Regulation, establishes conditions under which waste pesticide containers and other products can be disposed of. The Spill Reporting Regulation requires that the Provincial Emergency Program be contacted for pesticide spills that exceed five kilograms or litres.

Other Processes

Silviculture Prescriptions or Site Plans (SPs)

Silviculture Prescriptions or Site Plans apply. A registered professional forester oversees and prescribes a SP that is ecosystem based and accounts for different silviculture treatment regimes. An SP is a legally binding contract between the licensee and the Province. The licensee is obligated to achieve the silviculture standards specified in the SP, which may require vegetation management to achieve.

Appendix 3

Spill Reporting Standard and Form

STANDARD – SPILL REPORTING

Timberlands EMS

Purpose

To standardize the recording and reporting of spills of selected deleterious materials.

Scope

The scope of this Standard is all Timberlands operations, including Saanich Forestry Center and the Fibre Supply Group.

Definitions

- Spill: Unplanned release of a liquid, solid, or gas into the natural environment – ground or water or air.

Processes, Procedures and Responsibilities

Spill reporting is divided into 2 categories:

- **Reportable**: spills that are required by act or regulation to reported to outside agencies as noted for the type and quantity listed in Table 1 below
- **Recordable**: all spills WFP wishes to track to drive continual improvement. This will include all ***Reportable*** spills as well as others as defined in Table 1 below

All spills that fall into any of the categories in Table 1 are to be recorded on the ***Spill Report Form***. The completed form is then passed on to the designated operation contact. The information is to be entered into ITS as per the ***Cenfor User Guide.*** Both the ***Spill Report Form*** and the ***User Guide*** are posted on the WFP Intranet. In addition, the operation will send all completed spill report forms to the corporate Certification Coordinator for compilation, internal reporting and forwarding as required. The ***Spill Report Form*** can be completed by either a WFP employee or a contractor.

Reportable Spills

All *Reportable* spills must be reported to the proper agencies as soon as possible, and within 24 hours. This is normally done by the site supervisor who has the most detail on the spill and can respond to questions effectively. This can be either a WFP employee or a contractor. The **Initial Report** is generally a verbal call to the emergency response number so knowledge of the spill is important. Timely reporting is also important so even if not all the details are known the spill needs to be called in as soon as practicable and no more than 24 hours after it occurs. The ***Spill Report Form*** highlights the required information as per the *Spill Reporting Regulation* as well as information WFP wishes to track for our own continual improvement. This form is not to be shared with outside agencies without permission from the Certification Coordinator or the Manager, Forest Stewardship.

Note that regardless of size, if a spill enters, or could enter, a water body it is a **Reportable** Spill. This includes ditches that are dry but connect directly to water. Table 1 provides more information on water bodies.

All spills that involve a vessel must also be reported separately to MCTS/CCG (Transport Canada/Canadian Coast Guard).

The **Emergency Preparedness and Response Plan** (EPRP) has the most current contact information for Reportable Spills.

Remember, it is not against the law to have an accidental spill, however it is illegal to not report when required to.

Spills that are contained, either in secondary containment or spill onto a paved surface with no chance of running off or into water bodies, are not Reportable Spills. Note the containment area/paved surface must be free of cracks, potholes and other possible points the material may enter the natural environment. Examples of this type of containment include:

- Secondary containment around tanks
- Built-in secondary containment of tanks; ie double walled tanks
- Paved dryland sort decks
- Machine belly pans

For legally reportable spills, the BC Ministry of Environment & Climate Change Strategy has a 4 step reporting process:

1. **Initial Report**, due as soon as possible. This report is done by calling the spill report number at **1-800-663-3456**
2. **Update to Minister Report** that is required when any of the following conditions are met:
   - As soon as possible at the request of the Minister
   - At least once every 30 days after the date that the spill began until such time that the **End of Spill Report** is required
   - At any time there is reason to believe that information previously reported as part of the Initial Report was or has become inaccurate
3. **End of Spill Report** is required to be submitted within 30 days of the completion date of the spill. This is when all of the following have been completed:

   (a) the incident command post is disestablished;

   (b) the source of the spill is under control and is neither spilling nor at imminent risk of spilling;

   (c) emergency actions to stabilize, contain and remove the spill have been taken;

   (d) the waste removed from the spill site has been

   (i) received at a facility for disposal, or

   (ii) received for transportation to a facility for disposal;

   (e) if applicable, all notices respecting evacuation from the spill site have expired or been rescinded;

   (f) all equipment, personnel and other resources used in emergency spill response actions have been removed from the spill site, other than equipment, personnel or other resources required for

(i) sampling, testing, monitoring or assessing at the spill site, or
(ii) recovery or restoration of the spill site.

The Ministry supplies the form that is to be used for the (2) **Update to Minster Report** and the (3) **End of Spill Report**. The current version is available on the Ministry web site https://www2.gov.bc.ca/gov/content/environment/air-land-water/spills-environmental-emergencies/report-a-spill under Templates.

4. **Lessons Learned Report** if ordered by the Ministry. Details of what is required will be provided as part of the Order

Recordable Spills

Table 1 lists the quantities that will trigger a Recordable spill. With the exception of reporting to external agencies, the process for recording is the same as noted above.

Table 1: Reportable and Recordable Spill Reporting Thresholds

Product	Examples	Legally Reportable Amount To Land	WFP Recordable Amount
Explosives	ANFO, Frag Pack	Any	Any
Flammable Gases	Propane, Acetylene	≥ 10kg	≥ 10kg
Flammable Liquids	Gasoline, Diesel, Hydraulic Fluid, Waste Oil, etc.	≥ 100 litres	≥ 25 litres
Other Liquids	Antifreeze	≥ 25 litres	≥ 5 litres
	Pesticides, Herbicides	≥ 5 kg or 5 litres	≥ 5 kg or 5 litres
Paint	Endseal and stenciling paint	≥200 litres	≥200 litres

Water Bodies

If a spill enters, or could enter, a water body, it is a Reportable Spill regardless of size.

Water bodies include:

Stream, lakes, ponds, rivers, creeks, springs, ravines, gulches, wetlands, glaciers, aquifers, and fish habitats; and ditches (even if dry) that could drain or empty directly into a water body

If In Doubt, Report!

Version History

Version	Revisions By	Revision Date	Description of Revision	Approval
0.1	W. Sloan	November 19, 2018	Draft standard created for review	N/A
1.0	W. Sloan	December 31, 2018	Approved	S. Glen

Western Forest Products Inc.
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Spill Report Form

Timberlands EMS

Red Outlined Are Mandatory

Report Type Initial ◯ Update ◯ End ◯

Date of Spill DD/MM/YYYY:	**Time of Spill** (24 hr format):	**ITS #**

Location of Spill

Operation: Opening No. Road Name

Map/Sketch Attached Yes ◯ No ◯ Long.: Lat.: UTM: Photos ☐

Location details e.g. distance to nearest town:

Spill Reporting

Date spill reported to Operation DD/MM/YYYY: By whom:

Person reporting/completing the spill report form:	Phone No.:	Email:
Person responsible for the spill, if not the owner of the spilled material (has possession or control of substance when spill occurs):	Phone No.:	Email:
Owner of the spilled material: WFP ◯ Other ◯ describe:	Phone No.:	Email:

Spill Source:

Barge ◯ Valve ◯ Pipeline ◯ Storage Tank ◯ Drum ◯ Equipment ◯ Vessel ◯ Tanker Truck ◯

Other ◯ (describe): Equipment Information:

Unit No./Year/Make/Model of equipment involved

Circumstances / Apparent Cause / Contributing Factors:

Accident ◯ Fire/Explosion ◯ Transfer/Loading ◯ Equipment Loss/Failure ◯ Unknown at this time ◯

Is spill stationary? ◯ Or moving? ◯

Detailed Description (e.g., ruptured hose, overfill, sinking, motor vehicle accident)

Environment Affected: Land ◯ Water ◯

e.g., Ocean, Lake, River, Stream, Ditch, Land, Road; include additional details (e.g., soft ground, wooded area)

Impacts

Area of spill (m^2) Water Bodies ☐ provide details in the Comments

Human Health Injuries ☐ Fatalities ☐ Evacuees ☐ provide details in the Comments

Biological Flora & Fauna ☐ Animal, Fish, and Plant Habitat ☐ provide details in the Comments

Comments:

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Spill Report Form

Timberlands EMS

Material Spilled: UN Number if applicable: Is discharge continuing? YES ◯ NO ◯

Diesel ◯ Hydraulic Fluid ◯ Gasoline ◯ Lubricating Oil ◯ Fertilizer ◯ Explosives ◯ Anti-freeze ◯ Flammable Gas ◯

Pesticide ◯ (name): Other ◯ (describe):

Estimated Volume/Weight: litres □ kilograms □ Slick Size: (m) by (m)

Environmental Conditions:

Weather: Clear □ Cloudy □ Raining □ Snowing □ **Wind:** Direction Speed (km/h)

Air Temperature (^{0}C)

Water: Calm □ Choppy □ Rough □ Strong Current □ N/A □

Comments:

Actions Taken/Proposed: e.g to stop, contain and mitigate spill

External Notifications

Agency (all applicable)	On-scene Yes	Location (Office)	Contact Person	Date	Time	Method (Verbal, FAX, Mail, Phone, E-Mail, Other)
EMBC/PEP	□					
BCMOE	□					
MCTS/CCG	□					
MFLNRO	□					
D.F.O.	□					
WCMRC	□					
Police	□					
Fire	□					
Medical	□					
WFP Corporate	□					
Other:	□					

Communication Notes EMBC/PEP incident number: DGIR number

Instructions: This form is to be used to document the reporting of spills internally and to external government agencies. The incident is entered in ITS. A copy of the report is sent to all designated company personnel.

Timely reporting is required by government regulation. The initial report to EMBC/PEP can be verbal, but must include the mandatory details above.

All spills to a water body, including dry ditches that lead directly to a water body, must be reported to EMBC. Water bodies include:

Stream, lakes, ponds, rivers, creeks, springs, ravines, gulches, wetlands, glaciers, aquifers, and fish habitats; and ditches (even if dry) that could drain or empty directly into a water body

All spills involving a vessel must also be reported separately to MCTS/CCG (Transport Canada/Canadian Coast Guard)

If in doubt, report.

Appendix 4

DETAILED SITE ASSESSMENT FOR FORESTRY HERBICIDE APPLICATIONS

Detailed Site Assessment
Western Forest Products – Stillwater Forest Operation

PMP Number:

Administration

License: TFL 39, Block 1 **CP:** **Opening:** **Map #:**

Location: **Stratum:** **Access:**

Site Description

Subzone: CWH **Site series:** **Topography:**

Crop Trees

Stratum	Species Composition	Av. Height (cm)	Av. DBH (cm)	Well Spaced (sph)	Total sph
A					

Target Species

Stratum	Target Species	Av. Height (m)	% Cover	DBH Range (cm)	Distribution %	Hazard L-VH
A						

Environmental Protection

Waterbodies

Stratum	Waterbody	Stream Class	Fish Present	Comments

Actions prescribed to protect water and riparian resources

Water will be buffered if encountered on the block

Water intakes or domestic dwellings within 200 m of treatment? (Y/N) N

Habitat Comments (note features e.g. wildlife trees, bear dens, nests, heavy browse, wetlands)

Habitat Protective Measures

Rare Plants or Rare Natural Plant Communities

Other human activities associated with the site

Treatment Rationale

Treatment Purpose

Method	Single stem treatment by low pressure backpack.

Herbicide	Triclopyr	**PCP NO.**		**Rate (ai kg/ha)**	
Year/season		**Area (ha)**		**Quantity a.i.(kg)**	
Concentration – Product: Carrier					

Comments

Prescription prepared by:	**Date**	

Signature and Seal:

Appendix 5

Notice of Intent to Treat

PMP Confirmation # _____ Office Location: _____ Notification Submitted by: _____

Phone #: _____ Date of Submission: _____ Page _____ of _____

Opening # or Obligation Number	Planned Start Date	PMP Operating Zone	Treatment Area (ha)	Application Method Codes	Herbicide Product	PCP #	Proposed Product Use Rate (Litres/ha)	Target species Codes	Fish Habitat Present (Y/N)	Site-specific First Nations Traditional Use Identified (Y/N)	Wildlife habitat requiring protection present (Y/N)	Within a Community Watershed (Y/N)	Water Intake or house within 200m (Y/N)

Chemical Method	Code	Manual Method	Code		Common Target Species	Code	Common Target Species	Code
Backpack selective	01	Powersaw	05		Salmonberry/thimbleberry	Rubu spp	Black cottonwood	Act
Backpack broadcast	02	Girdle	06		Elderberry	Samb rac	Red alder	Dr
Backpack basal	03	Handtools	07		Fireweed	Epil ang	Willow	W
Squirt bottle	04				Grass	Grass spp	Bitter cherry	Vb
					Bracken fern	Pter aqu	Bigleaf maple/ vine maple	Mb/Mv
					Vaccinium	Vacc	Douglas maple	Md
					Salal	Gaul sha	Red-osier dogwood	Gr
					Japanese Knotweed	JK	Pacific dogwood	Cn
							Cascara	Rp

Appendix 6

Newspaper Advertisement

DEVELOPMENT OF A PEST MANAGEMENT PLAN

Application # WFP-SFO-PMP-2020

Applicant: Western Forest Products Inc., Stillwater Forest Operation
201-7373 Duncan Street, Powell River, BC, V8A 1W6, 604-485-3110

The **purpose** of this proposed Pest Management Plan (PMP) is to manage competing vegetation on crown lands managed for sustainable forests. The PMP applies to harvested areas within TFL 39, Block 1. It generally extends from south of Lois Lake in the SE, to the upper Theodosia Valley and Powell Daniels in the North.

The PMP methods proposed for use include both manual methods and herbicide applications. An integrated pest management planning process is implemented to determine if manual or herbicide treatments are necessary to control competing vegetation. No herbicide use is allowed under this plan in community watersheds.

The common names and examples of the trade names of the herbicides proposed include: glyphosate (Vantage XRT) and triclopyr (Release XRT or Garlon XRT). Selective application methods will be used using backpack sprayers.

The proposed duration of the PMP is for five years from July 1, 2020 to June 30, 2025.

Due to COVID-19 a draft copy of the proposed PMP and treatment area map may be examined in detail at https://www.westernforest.com/responsibility/environment/practices-plans/

Please contact Nancy Pezel, RPF at 604-485-3110 to make alternate arrangements for viewing the plan and map if you do not have access to a computer.

A person wishing to contribute information about a proposed treatment site, relevant to the development of the PMP may send copies of the information to the applicant at the address listed above within 30 days of the publication of this notice.

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Appendix 7

Pest Management Plan

Annual Follow-Up Report

Year:

Confirmation # _____ Plan Holder Name: Western Forest Products Inc. Stillwater Forest Operation Office Location: Powell River

Please include non-pesticide treatments as well using the method codes shown.

Treatment Location							
Operating Zone	TFL 39 Block 1	TFL 39 Block 1	TFL 39 Block 1	TFL 39 Block 1	TFL 39 Block 1	TFL 39 Block 1	TFL 39 Block 1
Application Method(s) Codes							
Product							
Herbicide PCP no.							
Purpose of Treatment Codes							
Rate (kg a.i./ha)							
Treatment area (ha)							
Quantity of active ingredient used (kg)							

Name: _____ Title: _____ Date: _____ Telephone #: _____

Application Method Codes

Backpack selective	01	Power Saw	05		Regeneration brushing	RB
Backpack broadcast	02	Manual Girdle	06		Site Preparation	SP
Backpack basal	03	Hand tools	07		Pre-harvest treatment	PH
Squirt bottle	04				Crop tree release	CTR

Purpose of Treatment Codes

Summary

Pesticide Product	Total area treated (ha)

Active Ingredient	Total quantity a.i. used (kg)

Appendix 8

Changes Made as a Result of Comments Received

The following changes were made since the draft PMP was advertised for review and comment:

(1) A section on hardwood management was added to Section 4 as a result of public concern about fire hazard and perceived lack of a deciduous component within TFL 39 Block 1. This section also explains that managing for deciduous species on rich sites reduces the amount of potential treatments required on these high brush hazard sites.
(2) To further emphasize that manual treatments are preferred over herbicide treatments, the order of Tables 4 and 5 were changed to show the manual treatment table before the herbicide treatment table.
(3) To further emphasize that manual treatments are preferred over herbicide treatments, and our commitment to prefer selective over broadcast treatments, broadcast spray treatments were removed from Table 6. Backpack selective applications were also removed as options for treating bracken fern and fireweed. These latter species will only be treated with manual methods. In Table 5, the Herbicide Backpack Broadcast (Glyphosate) treatment column was also removed, leaving only selective treatments.
(4) Based on public comments, the statement in Section 4.1(3) *On **high** to **very high** brush hazard sites, herbicide site preparation prior to planting is the preferred management strategy* was deleted, as this has not been a standard practice in the past 6 years nor do we plan to carry out herbicide site preparation treatments during the term of this PMP. Prompt planting with good quality, large stock is the preferred method of crop establishment on high and very high brush hazard sites to reduce the need for brushing treatments.
(5) Based on comments received from the shíshálh Nation, a reference to pesticide sensitive features was removed as these are not defined in the IPM Act or Regulation, or in the glossary.
(6) Also based on comments received from the shíshálh Nation, the word “rare” was removed as it is used interchangeably with “endangered” to describe species or ecosystems that are at risk.
(7) Based on comments received from the shíshálh Nation the broken link to the Annual Reporting form was replaced with the current link.

Appendix 9

Review and Comment Summary

IPMR Sec 61 (1)
Providing Notice

Notice Published	Date Published
Powell River Peak: April 22nd, 2020 to May 30th, 2020	April 22nd, 2020 and April 29th, 2020 (free newspapers for widest circulation)

SCANNED

POWELL RIVER PEAK

Please make payable to: Peak Publishing Limited Partnership
Unit-F 4493 Marine Avenue
Powell River, BC V8A 2K3
Phone: 604-485-5313

Account No.	Invoice Date
006063	04/29/2020

Net Due	Invoice No.
573.05	PRCL00060618

Amount Paid

Western Forest Products - Stillwater
#201 7373 Duncan Street, #300
Powell River, BC V8A 1W6

PO 31-2020

PLEASE RETURN THIS PORTION WITH YOUR PAYMENT

Account No.	Invoice No.	Invoice Date	Ad No.	P.O. No.	Newspapers	Issues	TS
006063	PRCL00060618	04/29/2020	691237	31-3342	1	2	0

Classification	Size	From	To
5050 Legal Services	13.9794 Inches	04/22/2020	04/29/2020

Ad published in	First Placement
The Peak Midweek	04/29/2020, p. A15

60725.31.880.501.00.00

$545.76

PAID May 27/20

ENTERED May 5/20

TOTAL:	545.76
HST/GST: (83149-8878-RT001)	27.29
PST:	0.00
ADJUSTMENT:	0.00
PAYMENT:	0.00
NET DUE:	573.05
AMOUNT PAID:	

Text:

EPS: 117798. DEVELOPMENT OF A PEST MANAGEMENT PLAN Application # WFP-SFO-PMP-2020 Applicant: Western Forest Products Inc., Stillwater Forest Operation 201-7373 Duncan Street, Powell River, BC, V8A 1W6, 604.485.3110 The purpose of this proposed Pest Management Plan (PMP) is to manage competing vegetation on crown lands managed for sustainable forests. The PMP applies to harvested areas within TFL 39, Block 1. It generally extends from south of Lois Lake in the SE, to the upper Theodosia Valley and Powell Daniels in the North. The PMP methods proposed for use include both

KEEP THIS COPY FOR YOUR RECORDS

2005 Antiques

Paying CASH for Old Military Items

Any and all old military items and war souvenirs: Uniforms, Helmets, Medals, Blades, photographs, badges, insignia, souvenirs, etc. Canadian, German, American, British, Italian, WWI, WWII, and so on. Any era, any amount, and any size! Paying fair prices and will travel!

604-828-1182

2060 For Sale Miscellaneous

COAST BERRY Company 30 lbs frozen blueberries, 25 lbs frozen strawberries, 1L pure frozen blueberry juice, can arrange delivery call 604.487.9788

COMPOUND BOW, Hoyt Spyder 30, right hand, 60 to 70 lb draw. $650. OBO. Call or text 604.414.3529

2145 Wanted

RIDE-ON lawn mowers, running or not, cash for some. Contact Don at 604.487.0487

WOULD LIKE to buy used yard ornaments that require painting. Call 604.485.7747

6025 For Sale by Owner

ACREAGE FOR sale. Four minutes from city centre on Allen Avenue, six building lots, fully serviced. $300,600. 604.483.1632

ADVENTURER 7.5 FT camper, good condition, sleeps four, fridge, stove furnace, memory foam bed. $8,500 Text 604.414.4578

6070 Real Estate Wanted

WANTED OCEANFRONT property south of town. No realtors please. 604.485.6467

6505 Apartments/Condos for Rent

2-BDRM APARTMENT is available 1st of the month, heat and hot water included, $790. Phone 604.485.2895

5520 Legal/Public Notices

DEVELOPMENT OF A PEST MANAGEMENT PLAN
Application # WFP-SFO-PMP-2020

Applicant:
Western Forest Products Inc., Stillwater Forest Operation
201-7373 Duncan Street, Powell River, BC, V8A 1W6,
604.485.3110

The purpose of this proposed Pest Management Plan (PMP) is to manage competing vegetation on crown lands managed for sustainable forests. The PMP applies to harvested areas within TFL 39, Block 1. It generally extends from south of Lois Lake in the SE, to the upper Theodosia Valley and Powell Daniels in the North.

The PMP methods proposed for use include both manual methods and herbicide applications. An integrated pest management planning process is implemented to determine if manual or herbicide treatments are necessary to control competing vegetation. No herbicide use is allowed under this plan in community watersheds.

The common names and examples of the trade names of the herbicides proposed include: glyphosate (Vantage XRT) and triclopyr (Release XRT or Garlon XRT). Selective application methods will be used using backpack sprayers.

The proposed duration of the PMP is for 5 years from July 1, 2020 to June 30, 2025.

Due to COVID-19 a draft copy of the proposed PMP and treatment area map may be examined in detail at https://www.westernforest.com/responsibility/environment/practices-plans/

Please contact Nancy Pezel, RPF at 604.485.3110 to make alternate arrangements for viewing the plan and map if you do not have access to a computer.

A person wishing to contribute information about a proposed treatment site, relevant to the development of the PMP may send copies of the information to the applicant at the address listed above within 30 days of the publication of this notice.

WFP
Western Forest Products Inc.
DEFINING A HIGHER STANDARD™

2060 For Sale Miscellaneous

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6515 Commercial

PR4RENT.ca
FOR DETAILS ON
COMMERCIAL PROPERTY
IN POWELL RIVER
604.483.8200

9185 Boats

15.5' GLASSCRAFT runabout, 60 hp Johnson, trailer, chart plotter, excellent condition, $5,500. OBO Call 604.485.4960

1998 SEARAY, 27", special edition, includes 2012 tandem axle trailer, 650 hours $32,000. 604.414.8595

8325 Sand & Gravel

5050 Legal Services

DEVELOPMENT OF A PEST MANAGEMENT PLAN
Application # WFP-SFO-PMP-2020

Applicant:
Western Forest Products Inc., Stillwater Forest Operation
201-7373 Duncan Street, Powell River, BC, V8A 1W8, 604.485.3110

The purpose of this proposed Pest Management Plan (PMP) is to manage competing vegetation on crown lands managed for sustainable forests. The PMP applies to harvested areas within TFL 39, Block 1. It generally extends from south of Lois Lake in the SE, to the upper Theodosia Valley and Powell Daniels in the North.

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Western Forest Products Inc.
DEFINING A HIGHER STANDARD™

IMPR Sec 61 (2)
Review and Comment

The following pages represent all the outgoing letters/e-mails sent to First Nations, local Government and the Public. E-mails and letters received and WFPs responses are included after the summary.

As all correspondence between WFP, First Nations, Government and Public submitted to the Ministry of Environment and Climate Change Strategy are confidential, they have been removed from this website version of the PMP