



Pest Management Plan (Draft)

Plan Number: TFL44GP.PMP.1.2021-26

**TFL 44 General Partner
Port Alberni**

2021-2026

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1. SUMMARY

1.1 Purpose

The purpose of this *Pest Management Plan* (PMP) is to implement a proactive program of identification, prevention, treatment and monitoring of competitive vegetation species, or *pests* (*deciduous* trees, shrubs, and herbaceous vegetation) to ensure successful regeneration of future forest stands. This PMP, within the Integrated Pest Management (IPM) legislative framework, will facilitate the fulfillment of Tree Farm Licence 44 General Partner's (TFL 44 GP) silviculture obligations as required by the Forest and Range Practices Act and associated regulations.

TFL 44 GP, in its own capacity and its capacity as the general partner of the TFL 44 Limited Partnership, is responsible for forest vegetation management strategies including using *herbicides* where appropriate and permitted by the PMP on public lands within Tree Farm Licence 44. A silviculture regime that involves the potential use of *herbicides* considers environmental, social, and economic considerations. As such, TFL 44 GP provides an opportunity for public and First Nation consultation in the PMP and annual program development. The PMP is also consistent with TFL 44 GP's Environmental Policy, *Environmental Management System*, and Indicator 3.1.2a CSA Sustainable Forest Management Plan.

1.2 Geographic Boundaries

This PMP is for TFL 44 GP's Port Alberni Forest Operation. It is comprised entirely of crown land containing no Private Managed Forest Land. The area covered by the PMP is the Timber Harvesting Land Base (THLB), excluding areas of TFL 44 with silviculture liability managed by third parties, for example, BC Timber Sales. The THLB is 77,600 hectares with forest age class 0 – 20 making up roughly 30% at 23,640 hectares. The various types of vegetation management described throughout the PMP occurs, where required, in the age class 0-20 years.

The attached PMP Overview Map illustrates the geographic boundary of TFL 44, blocks with possible brushing treatments (herbicide or manual), near by communities, major bodies of water and other important features. Additional monitoring and on-site assessments are needed for the areas identified as "possible brushing treatments" to determine if brushing is required and what technique will be used. The different treatment techniques and thresholds are described in detail in Section 3 below.

1.3 Contact Information

The principal contact for information pertaining to the Pest Management Plan and the person responsible for vegetation management is:

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1.4 Term of the Plan

The term of the plan is for 5 years from the date the Confirmation of Receipt of Pesticide Use Notice and approved Confirmation number is provided by the BC Ministry of Environment Integrated Pest Management Act representative.

1.5 Treatment Regimes

The three types of treatment regimes include preventative, herbicide and non-herbicide regimes. Preventative treatments include pre-harvest site classification of the ecosystem, pre-harvest determination of pre-existing vegetation and their expectant return post-harvest, *site preparation* for roadside debris and planting within 2 years of harvest complete using the best genetic stock available. Non-herbicide treatment techniques include girdling, power saw cutting cutting, and stem bending. Chemical treatment techniques include foliar spray (with backpack) and basal bark spray. The active ingredients for these chemical herbicide applications are glyphosate and triclopyr.

Throughout the 2014-2019 term of the previously held PMP by Western Forest Products over the same geographical area, the following amount of herbicide and non-herbicide (manual) brushing treatment techniques were used:

- Total hectares treated: 289 ha
- Non-herbicide manual treatment: 195 ha or 67%
- Herbicide treatment: 94ha or 32%

(Note that no herbicide treatments were carried out in 2020 as the previously held PMP expired in 2019.)

2. CONSULTATION PROCESS

First Nations and individuals or organizations of the public are consulted in the development of the draft Pest Management Plan and the annual treatment programs. They are provided with a copy of the draft PMP with map and contacted to hear their comments or concerns to determine if or how the PMP should be modified to avoid impacts.

2.1 First Nations Information Sharing

TFL 44 is located within the traditional territories of the following First Nations:

- Stz'uminus
- Cowichan
- Ditidaht
- Hupacasath
- Ts'ubaa-asatx (Lake Cowichan)
- Lyackson
- Pacheedaht
- Penelakut
- Tseshaht
- Halalt

TFL 44 also falls within the Maa-nulth Treaty First Nation Areas of the:

- Huu-ay-aht
- Uchucklesaht
- Yuutu?il?ath
- Ka:'yu:'k't'h'/Che:k'tles7et'h'
- Toquaht

Throughout the information sharing process, each First Nation will be provided a copy of the draft PMP with map and invited to provide comments or request any other information. Should any concerns be identified, TFL 44 GP will work with the First Nations to find agreeable solutions.

The annual Notice of Intent to Treat (NIT) will be sent as notification to the First Nation if there is any herbicide work to be done in their traditional territory or Area of Interest in any given year. The NIT package will be sent prior to the minimum number of days ahead of planned treatment, as specified by the First Nation during the consultation process and will include the agreed upon content. This commonly consists of the NIT table, overview map and detailed block treatment maps.

2.2 Public Consultation

Members of the public or community organizations who may be significantly impacted will be consulted in the development of the PMP. Near the beginning of the public consultation process, TFL 44 GP will present the draft PMP to the CSA public advisory group (WIWAG) to gauge public opinion and incorporate suggestions and improvements to help facilitate an approved PMP. In addition to this, TFL 44 GP will focus consultation with other known public interest groups who could be significantly impacted in addition to advertising the PMP in the local newspaper to catch any broader public interest as per IPM legislation.

The annual NIT will be sent to members of the public or community organizations that may be significantly impacted by the planned treatment or have expressed interest through the PMP consultation process. The NIT package will be sent prior to the minimum number of days ahead of planned treatment, as specified by the individual or community group and will include the agreed upon content, which commonly includes the NIT table, overview map and detailed block treatment maps.

3. INTEGRATED PEST MANAGEMENT PROGRAM

Integrated Pest Management (IPM) 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.

3.1 Prevention

TFL 44 GP uses several techniques to successfully establish crop trees amongst competitive vegetation without the need for herbicide or non-herbicide brushing treatments. Some of these preventative strategies include:

3.1.1 Pre-Harvest Ecosystem Classification

A *Professional Forester* determines the competing vegetation potential pre-harvest by completing ecological mapping using the *biogeoclimatic* ecosystem classification (BEC) system. The Field Guide for Site Identification and Interpretation in the Vancouver Forest Region (1994) predicts brush severity rating and the competing vegetation complex for each site series. The severity rating reflects the general level of post-logging site occupancy and growth by non-crop vegetation, and the potential impact on crop tree performance. The *Professional Forester* considers the severity rating and field observations when

developing the *Silviculture Instructions* for the *cutblock* which outline the planting prescription as described in section 3.1.3 below.

3.1.2 Site preparation

Site preparation will be completed, where appropriate, to improve *microsites* for seedlings by reducing or rearranging slash and rarely to treat heavy pre-existing brush. These treatments will improve survival, encourage growth, and facilitate higher density planting. The following types of *site preparation* are used:

- Piling roadside debris
- Pile burning
- Mechanical cutting (chainsaw or brush saw)

3.1.3 Planting

A prompt and effective planting prescription can result in new seedlings out-growing the competing vegetation, thereby reducing or eliminating the need for a brushing treatment. An effective prescription considers timing, planting density, species type, *stock type* and seedling quality.

Timing

On high brush potential sites, planting is targeted for the first planting season following harvesting. This limits the amount of brush at the time of planting to assist in better reforestation establishment.

Planting Density

In the Forest Stewardship Plan, the target *stocking* level is 1200 stems per hectare (*sph*) and the minimum *stocking* level is 600 *sph* for the majority of sites. If survival is impacted by the competing vegetation, brushing is required to ensure the *stocking* standards can be met. Planting higher densities on high brush sites can help eliminate brushing treatments, while still ensuring a desirable density is achieved. High brush sites are typically planted at 1200sph.

Species Type

Shade tolerant and/or fast-growing species, such as Western Hemlock and Red Cedar, are promoted where ecologically suitable on high to extreme brush sites where brushing treatments would otherwise be required to ensure the survival of shade intolerant species.

Stock Type

Stock type or plug size is determined based on soil depth, accessibility, and existing or potential vegetation competition. Smaller *stock types* (410, 412B) are necessary on sites with shallow soils or helicopter access and perform well on sites with low to moderate brush. On sites with deep soils and high brush potential, a larger *stock type* (412A, 512A) is preferred. Seedlings with larger plug sizes grow faster and have a better chance of out-growing the competing vegetation.

Seedling Quality

Seedling quality is maintained by using improved seed with high genetic worth. TFL 44 GP also performs seedling audits at the nursery throughout the growing season and during the lift to ensure that seedlings specifications are met. The seedlings are inspected for height, calliper, form, and disease. Seedlings not meeting contractor specifications are culled. High-quality healthy seedlings are essential for good survival, especially on challenging sites with established competitive vegetation.

3.1.6 Invasive Plant Management

The FSP outlines measures to prevent the spread of invasive plants for the following species: scotch broom, gorse, giant knotweed, Japanese knotweed. Some measures include:

- Regularly inspect equipment and vehicles for weed plant materials.
- Avoid roadside mowing in knotweed infested areas. Avoid mowing Scotch broom when in seed.
- Always assess pits for invasive species. Do not use infested pits.
- Treat invasive plants in high traffic areas (ex. shop yard).
- Grass seed promptly with weed free seed on exposed mineral soil within 100m of an invasive plant site.
- Work in uninfested sites before moving to infested sites, where possible. Wash machinery before moving from infested to uninfested areas.

3.2 Pest Identification

In this plan, the term '*pest*' refers to any species of competing vegetation that has the potential to limit or eliminate the ability of a seedling crop tree from establishing and/or reach *free growing* status. The competing vegetation communities that **may** receive a mechanical or chemical brushing treatment are:

1. **Herbaceous Perennials:** All above ground portions of herbaceous perennials die and regrow each year. Herbaceous species compete with newly planted seedlings for light during the stand establishment phase and contribute to vegetation and snow press. Common species include bracken fern and fireweed. It is uncommon that these species warrant treatment on TFL 44. Japanese knotweed and giant knotweed are an invasive perennial species with an expanding presence on the island and are always target for treatment when identified.
2. **Shrubs:** Shrubs have woody stems, grow for more than one year, have a max height of 8 metres, but are typically less than 4m. Common shrub species include elderberry, salmonberry, salal, thimbleberry, Scotch broom, and Vaccinium species.

Salmonberry, thimbleberry, and other Rubus species grow rapidly following harvesting and can form contiguous covers, creating "blackout" conditions, where minimal light reaches the ground. Scotch broom is an invasive species that is spreading rapidly along resource roads and is increasing in frequency in the plan area. Shrubs rarely hinder crop tree establishment on TFL 44 to the extent that they would need treatment due to the preventative strategies described above.

3. **Broadleaf Deciduous Trees:** Broadleaf trees can be further split into subordinate and dominant species.

Subordinate species are larger than shrubs (>8m) but are not overly competitive with evergreen crop trees. Species include bitter cherry, Pacific dogwood, cascara, and willow.

Dominant trees are greater than 8m and are competitive with evergreen crop trees. Species include big-leaf maple, red alder, and cottonwood. Big-leaf maple and red alder are the most common type of competition vegetation that warrants treatment on TFL 44. Big-leaf maple can regenerate by seed or by stump *coppices*. *Coppices* tend to form ball-shaped crowns, with diameters comparable to their height. *Coppices* can grow six plus metres in the first three to five years following harvesting, leading to *conifer* over-shading and *mechanical damage*.

Red alder is common through the plan area and regenerates by seed. Occurrence is higher in second growth areas due to thinner forest floors and greater seed source. Densities typically range from 200-2000 sp . Cottonwood is less common on TFL 44 and regenerates by seed and vegetative propagation following harvesting. It can reproduce from roots, stump sprouts, and from any partially buried fragments of branches. It can grow over three metres annually.

The main reference for identification of these species and other plants commonly found in the PMP area is Plants of Coastal British Columbia: Including Washington, Oregon, and Alaska (Pojar & MacKinnon, 2004).

3.3 Monitoring

Harvested *cutblocks* are evaluated on a regular basis, as per TFL 44 GP's silviculture survey regime. Properly timed surveys are essential in identifying and addressing problems which can affect the survival and performance of crop trees or prevent the achievement of *free growing* status of the future stand.

To help develop brushing prescriptions, the following information is collected during surveys: crop tree species/height/age/density, brush species/height/density or % cover, the brush impact on the crop trees, as well as information on any other health concerns.

Table 1: TFL 44 GP's survey regime

Surveys	Timing	Method	Purpose
Site Plan	Pre-Harvest	Walk-through	Complete ecological site classification and determine competing vegetation potential. Develop Silviculture Instructions considering brush severity rating, the competing vegetation complex and planned planting prescription.
Post-Harvest Assessment	Within 6 months of harvesting	Visual assessment and walk-through where required	Verify site plan. Review plantability. Determine if roadside <i>site preparation</i> is achieved. Monitor brush levels.
Survival	1 year post-planting	Plots as per silviculture survey manual	Assess survival and performance of planted trees, as well as for the trees established naturally. Determine if a replant is required to meet legal obligations for density or if a regeneration survey is required for additional performance monitoring.
Regeneration Performance (only for blocks with issues at survival survey)	1-2 years post-survival	Plots as per silviculture survey manual or walk-through	Monitor regen performance, determine if replanting required or if seedlings have recovered from issues seen at survival.

Stand Assessment	6 years post-planting for second growth blocks. 9 years post-planting for old growth blocks	Walk through or aerial (helicopter)	Monitor stand performance and determine if brushing treatment is required. If treatment is required, map out brushing treatment areas, collect information for brushing prescription and plan treatment for the following year or to correspond with timing of other treatments in the area. If no brushing treatment required, determine year to schedule Free Growing survey.
Free Growing	9-20 years post-harvest	Plots as per silviculture survey manual or aerial (helicopter) if no access available	Determine if <i>free growing</i> requirements have been met. If applicable, collect data for <i>pesticide</i> post-treatment monitoring.

3.4 Treatment Thresholds

With respect to vegetation management, injury thresholds outline the minimum characteristics of competitive vegetation species in relation to crop species, wherein a brushing treatment is required to ensure the achievement of a free-growing stand. Treatment thresholds vary depending on the ecosystem and associated vegetation complexes. It is valuable to have strong local knowledge and experience when determining these thresholds. The treatment thresholds are outlined in Appendix 1.

The following impacts are used in determining injury thresholds:

- Reduced vigour and growth from limited light.
- Crop tree damage from excessive snow press of competing vegetation
- Inability to achieve *free growing* status due to dominating competitive vegetation, in particular, dominant and subordinate trees.

To achieve the *free growing* milestone, a standard unit must have at least the minimum number of *free growing* trees outlined in their associated *stocking* standards. The Forest and Range Practices Act outlines the *free growing* standards for public lands in British Columbia. *Free growing* trees must be:

- An acceptable species, as outlined in the site plan or *silviculture* prescription
- Well-spaced, as outlined in the site plan or *silviculture* prescription
- The required minimum height, as outlined in the site plan or *silviculture* prescription
- Free from infection
- Free from unacceptable damage
- Free from unacceptable brush and tree competition

If enough trees cannot be considered free from unacceptable brush within the *free growing* window to meet required densities, as outlined in the site plan or *silviculture* prescription, the injury threshold is triggered, and a brushing intervention is required.

In rare circumstances on TFL 44, if the crop tree densities have dropped below minimum *stocking* levels outlined in the *site plan* and the red alder infill is sufficient to meet hardwood *stocking* standards, then the area is stratified and amended into a new standard unit with hardwood *stocking* standards. This eliminates the need for an alder brushing treatment.

The treatment thresholds are based on the following guidance information; where the area with the described condition would have to be at least 1 continuous hectare of the block, or greater than 5% of the standard unit area preventing the block from being free growing or achieving regeneration due to impending seedling mortality.

Perennials – If the competitive vegetation is comprised of perennial species, then a treatment is required only if the vegetation is taller than the crop species and the crop trees are suffering from *mechanical damage*, or suppressing the crop trees to cause decreased growth, vigor and eventual mortality. No treatment is required if the crop species is at or above the height of the competitive species.

Shrubs – If the competitive vegetation is comprised of shrubs, then a treatment is required only if the shrubs are suppressing the crop trees to cause decreased growth, vigor and eventual mortality. No treatment is required if the crop trees are at or above the height of the shrubs or are growing will through the shrubs and will soon surpass them in height.

Dominant trees (red alder) – If the competitive vegetation is comprised of red alder, the SU can be *free growing* if there are less than 100 well distributed, dominant *sph*. Alder is even considered to be an acceptable species up to 5% of the crop trees in the well-spaced or free growing distribution according to the stocking standards of Appendix D.1 in the FSP. Red alder of higher densities (>200 *sph*) are eligible for treatment if they are growing in such a way to suppressing the growth and vigor of the crop and impeding free growing status of the crop tree. Red alder and bitter cherry are acceptable at any density in small amounts as a means of rehabilitating or stabilizing soils along roads and creeks, in small patches up to 0.1 ha in size, and on slides.

Dominant trees (Bigleaf maple) – If maple is present, the SU can be *free growing* if there are less than 10 *sph* of maple (*coppices* or single stem trees). At higher densities (>10 *sph*), maple is treated if they are growing in such a way to suppressing the growth and vigor of the crop and impeding free growing status of the SU. Coppices pose the greatest risk to crop tree establishment and free growing status due to the large horizontal distance that they can occupy. A common non-herbicide treatment used for coppices is cut all but one or two dominant stems (single stemming) in order to encourage the tree to grow vertically, not through coppicing.

Subordinate trees (Bitter cherry, willow, dogwood) – If the competitive vegetation is comprised of subordinate tree species, then treatment is needed if they are growing in such a way to suppressing the growth and vigor of the crop and impeding free growing status of the crop tree. Subordinate trees rarely grow at a density to require treatment on their own and are more commonly included as a minor species in the treatment area for dominant trees such as red alder.

3.5 Treatment Selection Criteria

The forest professional considers environmental, social, and economical impacts when selecting the treatment method. The treatment thresholds (Appendix 1) outline the preferred herbicide and non-herbicide treatment methods for each crop species and competitive vegetation species combination. Some major considerations include:

- CSA Commitments: Indicator 3.1.
- First Nation and public input
- Availability of certified workers
- Treatment cost
- Coordinating with adjacent treatment projects

- Access
- Residences
- Wildlife features or habitat
- Location and presence of water courses, especially if related to fish habitat
- Effect on fish and water quality
- Water intakes
- Worker and public safety

3.6 Vegetation Treatment Options – Mechanical

3.6.1 METHOD: Girdling	
<p>A complete ring of bark, phloem, vascular cambium, and some wood is removed around the main bole of a tree with a girdling hand tool or a chainsaw (on larger trees). All lower limbs are removed.</p> <p>Selection Criteria: This method is most commonly used to treat larger red alder which are approx. 15cm DBH or greater and 3m tall or greater.</p>	
Benefits	Limitations
<ul style="list-style-type: none"> • Can be used in riparian areas and other <i>pesticide</i> free zones (PFZs). • Effective on large hardwoods. • <i>Selective application</i>. • If treated properly, long term efficacy (3 years). • Less re-sprouting than manual cutting. • Low cost of hand tools. • Not limited by difficult terrain. • Increases site stability and promotes retention of vegetation cover. Useful in riparian areas or where slope stability is an issue. • Public acceptance. • Hand tools can be substituted for a chainsaw in fire season. 	<ul style="list-style-type: none"> • Too laborious and costly for large areas of dense brush. • Timing may be restricted by Wildfire Regulation Schedule 3 if chainsaw is used to girdle or cut lower limbs. • Not effective on big leaf maple, bitter cherry, black cottonwood, or herbaceous species. • Risk of re-sprouting if not treated correctly. • Up to 2 years to kill brush. • Potential damage to crop trees when brush dies and falls 2-3 years post-treatment. • Dead trees remain standing for 2-3 years, so may be objectionable in highly visible areas • Cannot be done for treatment areas directly adjacent to active roads, due to uncontrolled falling of dead tree in 2-3 years. • Hand tools and chainsaw can be hazardous to workers. Repetitive strain injuries are common.
Decision to use treatment	
<ul style="list-style-type: none"> • Where <i>herbicides</i> are not permitted (ex. PFZs, water intake catchment areas). • Where brush consists of lower density red alder. • Where red alder is larger, >3cm DBH. • Where there is an abundance of riparian areas. • Where there is high wildlife value, fisheries values, special management areas, potential traditional uses. • Where slope stability is an issue. 	

3.6.2 METHOD: Stem Bending	
<p>Commonly called bracken whackin'. Herbaceous plants are bent with shovels, golf clubs, or hockey sticks to physically reduce their height.</p> <p>Selection Criteria: Sites where <i>conifer</i> seedlings are suppressed or have <i>mechanical damage</i> from winter vegetation press from 1+m tall bracken fern or fireweed.</p>	
Benefits	Limitations

<ul style="list-style-type: none"> • Can be used in riparian areas, <i>pesticide</i> free zones. • Public acceptance. • No restrictions during fire season. • Safer than manual/mechanical cutting 	<ul style="list-style-type: none"> • Low productivity, very expensive. • Must be completed annually until crop trees outgrow vegetation. • Narrow timing window- too early, vegetation can correct growth. Too late, and it requires more physical labour.
Decision to use treatment	
<ul style="list-style-type: none"> • Where bracken fern or fireweed are suppressing <i>conifer</i> seedlings and affecting survival. • Where bracken fern or fireweed are causing <i>mechanical damage</i> from winter vegetation press. 	

3.6.3 METHOD: Power Saw Cutting	
Target vegetation (shrub, or hardwood trees) is cut with a brush saw or chain saw.	
Selection Criteria: All sizes and species of shrubs and hardwoods, most commonly red alder and bitter cherry.	
Benefits	Limitations
<ul style="list-style-type: none"> • Can be used in riparian areas and other PFZs. • Faster and cheaper than manual girdling • Effective on a wide range of species. • Can treat brush taller than 2m. • Public acceptance. • Risk of re-sprouting is lowered to an acceptable level by appropriate timing and age of crop trees 	<ul style="list-style-type: none"> • Potential damage to non-visible crop trees. • High fire risk activity, so Wildfire Regulation Schedule 3 applies. • Safety hazards associated with saws, exhaust fumes, and repetitive motion injuries. • May reduce forage in short-term.
Decision to use treatment	
<ul style="list-style-type: none"> • Where <i>herbicides</i> are not permitted (ex. PFZs, water intake catchment areas). • Where there is an abundance of riparian areas. • Where there is high wildlife value, fisheries values, special management areas, potential traditional uses. • Where foliar spray is not possible (ie. herbaceous brush exceeds 2+m). • Where there are thick pockets of hardwoods. • Where there are big-leaf maple coppices, and chemicals are not possible. 	

3.7 Vegetation Treatment Options – Chemical (NO AERIAL APPLICATIONS WILL BE USED)

3.7.1 METHOD: Basal Bark Spray	
<p>Triclopyr mixed with oil is carried in a backpack tank and applied with a low-pressure sprayer to all sides of the lower stem of the target plant. The herbicide penetrates the bark and wraps the cambium layer.</p> <p>Selection Criteria: Species with coarse bark, or early leaf abscission, most commonly used in treatment areas of dense Big Leaf maple, less commonly on red alder.</p>	
Benefits	Limitations
<ul style="list-style-type: none"> • Less risk of physical injury to worker than cut stump, or manual/mechanical brushing. • High productivity. • Effective on many species. • Selective treatment. • Low volume of <i>herbicide</i> required. • Can be applied year-round. • Suitable for remote or difficult-to-access areas. • Not restricted by fire season. • Low risk of re-treatment. 	<ul style="list-style-type: none"> • Requires trained and certified workers. • High administrative workload, more supervision required. • Potential for applicator exposure. • Requires PFZ layout for both wet and dry riparian features. • Has weather restrictions where it cannot be applied if water is running down the main stem or if snow is higher than the treatment height. • Restricted use in areas of community watersheds, water intakes, areas with dense stream networks, or areas of public concern.
Decision to use treatment	
<ul style="list-style-type: none"> • Sizeable treatment area • Low wildlife values, infrequent riparian features, no identified traditional uses or other public concerns. • During fire season. 	

3.7.3 METHOD: Foliar Spray with Backpack	
<p>Glyphosate is transported in a backpack tank and applied using a manual or motorized pump and adjustable sprayer with appropriate surfactant. Cones can be used to direct the spray.</p> <p>Selection Criteria: Invasive knotweed, scotch broom, gorse.</p>	
Benefits	Limitations
<ul style="list-style-type: none"> • Effective for several years (2-4). • Efficient, low cost treatment. • Targets specific vegetation, with adjustable application rates/dosages. • Low leaching factor limiting uptake by other plants 	<ul style="list-style-type: none"> • Reduced efficacy on vegetation heavily covered with dust. • Subsequent treatments may be required depending on size of target vegetation. • Requires trained and certified workers. • High administrative workload, more supervision required. • Potential for applicator exposure.

	<ul style="list-style-type: none"> • Requires PFZ layout. May require a buffer depending on wind direction and topography. • For safety, limited to brush below head height (~2m). • Restricted by weather conditions.
Decision to use treatment	
<ul style="list-style-type: none"> • Used to target invasive knotweed, scotch broom and gorse. • Low wildlife values, infrequent riparian features, no identified traditional uses, or other public concerns. • Qualified crew available during treatment window. • Extended fire season, shutting down treatment options involving chainsaws/brush saws. 	

3.8 Post Treatment Monitoring

Post-treatment evaluations (aerial or walk-through) are completed when full leaf out has occurred, one to two seasons following the treatment. The assessment considers the following:

- Was the area treated in the manner prescribed?
- Was the treatment a success? Did it achieve the intended goal?
- Were the appropriate *pesticide* free zones or no-treatment areas established? Were there any unintended impacts?
- Were the boundaries consistent with the treatment plan?
- Were crop trees damaged? What species? What percentage?
- Is there a need for any further treatments?

Where possible, on lower risk sites, the post-treatment evaluation occurs two seasons following the treatment to combine with the free-growing survey. While collecting the *free growing* data, the surveyors answer the above questions, take photographs or video of the previous treatment area, and estimate the number/cover of *pest* plants remaining in the treatment area.

4. OPERATIONAL PRACTICES

4.1 *Pesticide* Containment

A *Pesticide* must be kept, handled, stored or transported:

- In the container in which it was originally packaged and with the label originally affixed by the manufacturer,
- Or in a container designed for containing the *pesticide* and labelled with the trade name of the *pesticide*, the name and the concentration of the active ingredient in the *pesticide*, and the *pesticide*'s registration number under the federal Act.

This requirement does not apply to tanks being used for mixing or holding *pesticides* during use.

4.2 Pesticide Transportation

All *herbicide* products will be transported in accordance with the Transportation of Dangerous Goods Act and the Integrated Pest Management Act and Regulations. The minimum requirements are:

- *Pesticide* containers will be upright and secured during transit and placed in locked, signed compartments when vehicles are left unattended.
- *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, a storage box will be made of non-absorbent material.
- *Pesticides* will be transported with a spill kit, and the driver will be trained in emergency spill procedures.
- *Pesticides* will always be carried separately from food and drinking water, safety gear, first aid equipment, and people.
- Safety data sheets (SDS) and Product Labels will accompany all *pesticides*.

4.3 Pesticide Storage

Pesticides will be stored in accordance with the Integrated Pest Management Act and Regulations. In summary, storage areas must:

- Have proper ventilation so that *pesticide* vapours are vented to the outside
- Be accessible to authorized personnel only
- Be locked and secured when unattended
- Not be used for the storage of food intended for human or animal consumption
- Have clearly visible warning signs indicating "Warning- Chemical Storage Area- Authorized Personnel Only"
- Not be located within the greater of 50 metres or the extent of a riparian management area

Temporary storage in the back of a locked vehicle is permissible when all conditions for *herbicide* storage are met. It must be stored in a locked canopy, or similar arrangement, separate from the occupants and personal protective equipment.

4.4 Mixing, Loading, and Application of Pesticides

All *pesticides* will be mixed at designated mixing and loading sites. These sites must have an adequate water supply for cleanup and emergencies. The mixing site will be on level ground and situated so that if a spill does occur, contamination of a water feature will be prevented. These sites must be adequately separated from eating areas.

General procedures and precautions include:

- Crews must be properly qualified and trained.
- All *pesticide* mixing, loading, and application must be performed in accordance with the product label.

- All workers will wear the personal protective equipment and clothing outlined in the safety data sheets (SDS). All personal protective equipment and clothing must be cleaned daily and checked frequently for wear.
- All mixing and loading sites must have washing stations, first aid equipment, product labels, safety data sheets, spill kits, spill response plans, and emergency phone numbers. Mixing and loading sites will be in the treatment area, whenever possible.
- *Pesticides* will be mixed in good light with adequate ventilation. Pouring, measuring, and mixing will be done outdoors under low wind conditions. The mixer will stand upwind to minimize airborne exposure.
- *Pesticides* must be prevented from entering any body of water or irrigation system used to draw water for the containment, preparation, mixing or application of a *pesticide* by maintaining a gap between the *pesticide* and the equipment used to draw water.
- All empty containers will be triple rinsed into the spray tanks and slashed. However, a container used to prepare, mix, or apply a *pesticide* must not be washed or submerged in a body of water.

Prior to the application:

- All crew members must receive orientation on the use, handling, and application of the chemical, care of the applicator equipment, along with on-the-job training.
- All crew members should be informed of the boundaries of the treatment area, including *buffer* zones surrounding *streams*, lakes, and other bodies of water.
- *Pesticide* free zones and no-treatment zones will be established where required.
- All application equipment will be inspected daily. If required, it will be calibrated to conform with the application rates on the *pesticide* label.
- Warning signs will be posted at all points of entry to the treatment site.

During the application:

- 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.
- Where possible, work will be arranged so that workers do not have to pass through previously treated areas. If not possible, workers must wear the protective equipment necessary to prevent skin contact with treated foliage.
- The contractor supervisor must monitor wind speeds and temperatures. The crew will stop foliar applications if wind speed is more than 8km/hr or if air temperature is above 30 degrees Celsius.
- *Pesticides* shall not be applied to vegetation that has water flowing off its foliage or down its stem, or to vegetation with foliage covered by ice or frost.
- *Pesticides* shall not be applied to water saturated soil, during heavy rainfall, or if heavy rainfall is imminent.
- The contractor supervisor will ensure that accurate records of equipment calibration, *herbicide* use and weather conditions are kept.

Mixing, loading and application will be conducted as per the instructions contained in the *Herbicide Field Handbook* (Boateng 2002) and WorkSafe Standard Practices for *Pesticide Applicators* (WorkSafe BC 2009).

4.5 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 rinsed liquid will be added to the spray mix for treatment application. Afterwards, the containers will be crushed or slashed before being taken to an approved landfill or recycling depot. All *pesticide* containers must be accounted for.

4.6 Spill Response Plan

A *pesticide* spill kit and spill response plan will be maintained at mixing and loading sites. The *pesticide* spill kits will contain the materials listed on page G-4 of the MoF *Herbicide Field Handbook* (Boateng 1998). The contingency plan will be reviewed with all applicators and mixing/loading personnel prior to the start of each project. The spill contingency plan will contain measures aligned with page G-5 of the *Herbicide Field Handbook*. A company representative must approve both the spill kit and contingency plan prior to project commencement.

Remote-access Spill Kit

In areas with limited access – access by helicopter, floatplane or boat with no truck – a reduced-content spill kit is permissible. The remote-access spill kit will have the following minimum contents:

- Spill contingency plan and emergency contact information and phone numbers
- Kitty litter or similar absorbent substance
- Absorbent pads (Absorbal)
- Large garbage bags (two or more)
- Personal protective equipment (if not already in possession of workers)
- Shovels (may be with fire equipment)
- Flagging tape
- Appropriate first aid kit as per Worksafe BC requirements

5. ENVIRONMENTAL PROTECTION

Environmental protection is mandated under the Integrated Pest Management Act and Regulations and provides the basis of the PMP protection plan.

5.1 Community Watersheds, Forestry Camp Creek Watershed and Water Intakes

The PMP area overlaps with the China Creek, Malachan, Haggard Lake and Cousteau community watersheds and several licensed and unlicensed water intakes or wells. TFL 44 GP will not use herbicide treatment techniques in any community watersheds, except to treat invasive species, such as knotweed.

The PMP area also overlaps the Forestry Camp Creek Watershed on the south shore of Great Central Lake opposite Brown's Bay Sort. This watershed is the main water source for the Omega Pacific Fish Hatchery. Refer to the PMP map for location. TFL 44 GP will not use herbicide treatment techniques within this watershed.

At minimum, for any newly identified water intakes, outside of community watersheds, the Integrated Pest Management Regulation will be followed. Water intakes will have a 30 metre radius no treatment zone. This

zone may be reduced if reasonably satisfied that the smaller zone will ensure that pesticide from the use will not enter the water supply intake or well. If requested, an additional no-treatment zone will be added to the entire *stream* above the intake. All registered water license holders within 200 meters of any treatment sites will be notified prior to the application of any *herbicides*.

5.2 Fish and Riparian Areas Protection

5.2.1 Classification and Establishment of No-Harvest Areas

Streams, lakes, and *wetlands* are identified pre-harvest during *cutblock* layout. Layout engineers map and classify all water courses, as per FPPR Sections 47, 48 and 49. If required, a biologist or fish-identification specialist assist in the classification of riparian features. Riparian management areas (RMA), riparian reserve zones (RRZ), and riparian management zones (RMZ) are applied according to FPPR.

Except for specific purposes outlined in Regulation, trees are not cut, modified, or removed from RRZs. This provides a sizeable *buffer* to all riparian features with a riparian reserve zone. The RRZ *buffer* for fish streams range from 20m-50m depending on the size of the stream. If the RRZ is cut, modified, or removed, then herbicides are not permitted within this zone.

5.2.2 Pesticide Free Zones (PFZ)

A *Pesticide Free Zone* is an area of land that must not be treated with *pesticide* and must be protected from *pesticide* moving onto it. *Pesticides* cannot reach the PFZ through drift, runoff, or leachate. A no-treatment zone may be required to ensure the integrity of the PFZ. The width of the no-treatment zone will vary with the application technique, the *pesticide* used, the topography, and the weather conditions.

Pesticide Free Zones will be established consistent with the Integrated Pest Management Regulation Sections 73 and 75. All PFZs will be identified in the field in advance to the treatment with flagging tape. A minimum 10m horizontal distance PFZ will be identified on the treatment map for all known *streams*, fishery sensitive zones, non-classified drainages, *wetlands*, and lakes to help with PFZ layout. Additional 10m horizontal distance buffers from the high-water mark will be applied to all other flowing water courses in the treatment area that are not previously known on the treatment map.

5.2.3 Other Measures

Competitive vegetation will not be treated (any method) if it is required to prevent the erosion of a stream bank. For biodiversity, small strips (~5m wide) of alder or bitter cherry will be retained along stream banks. Treatment areas with significant riparian features will be treated with non-herbicide methods.

5.3 Strategies to Protect Wildlife and Wildlife Habitat

There are four strategies used in pre-harvest planning that serve to maintain or enhance wildlife habitat:

1. Creation of no-harvest riparian management areas on all larger fish bearing water bodies; creation of management zones on all classified water bodies.
2. Establishment of wildlife tree retention areas (generally 7-15% of total harvest area) to achieve stand level *biodiversity* in each *cutblock*
3. Identification and management of nest trees and bear dens.
4. Designation of old growth management areas (OGMAs), wildlife habitat areas (WHAs), and Ungulate Winter Ranges (UWRs) provide older seral habitat for wildlife on a landscape level.

The above tactics are managed through approved *Site Plans* and Forest Stewardship Plans. The application of *herbicides* will be consistent with the protection measures stated in those operational plans, Regulation, and/or Higher-Level Plans.

Examples of habitat protection strategies are:

- Using *selective application* treatment methods such as basal bark spray to focus on targeted competitive vegetation species only, in order to maintain the forage species for regionally important wildlife species.
- Ensure that herbicide use is directed only at the target vegetation.
- Minimize soil erosion caused by vegetation management activities to reduce impact on desirable plants or wildlife
- *Pesticides* will not be applied over vertebrate wildlife or domestic animals that are visible to the applicator.

Pesticides will not be applied over vertebrate wildlife of domestic animals that are visible to the applicator.

5.3.1 Protecting Pollinators and Pollinator Forage Areas

Herbicides are not harmful to honeybees and other pollinators when using the targeted treatment techniques outlined in this PMP and applied according to herbicide label instructions. The indirect risk to pollinators, when considering herbicide use, is the potential affect it has on their food supply. The following strategies are used to reduce the impact that herbicide use on TFL 44 has on pollinator food supply:

- Herbicides are NOT applied to flowering vegetation that is a forage source of pollinators.
- Most competitive tree species that may be treated with herbicide are wind pollinated, eg. Alder, willow, maple, not insect pollinated.
- Herbicides are applied using selective treatment methods that target the intended competitive brush species only.
- Weather restrictions, such as wind speed and precipitation, must be followed when applying herbicide according to product label and PMP directions to ensure herbicide affects targeted species only.

5.4 Human Food Sources, Cultural Heritage Resources or Non-timber Forest Products

No specific food plant collection areas or cultural heritage resources of non-timber forest products have been identified in the plan area through First Nation consultation and public review process. Portions of the area are used for the collection of mushrooms, though no specific activity or location has been identified. Mushroom picking is not usually associated with *pre-free growing* stands where *herbicide* treatment could occur. Other potential food sources are berries and medicinal plants. The following strategies may be used to protect known food plant collection areas:

- avoid treatment
- alter treatment timing
- use selective treatment methods
- use non- *herbicide* treatment methods
- public consultation

Signs will be posted at the time of treatment, as per the IPM Regulation, and left in place for a minimum of 14 days.

5.5 Pre-Treatment Inspection Procedures for Identifying Treatment Area Boundaries

A pre-treatment inspection will be completed on all treatment sites by the Contractor supervisor and/or TFL 44 LP supervisor to identify the treatment area boundaries and the presence of sensitive areas, and water features. No treatment will proceed until it is confirmed there is no presence of the general public, and there is no visible wildlife in the treatment area.

If changes are to be made to the treatment boundary following the pre-treatment inspection, the change would be illustrated on a map and have the reason for the change clearly described in an attached rationale.

All treatment boundaries (where required), no-treatment zones, *pesticide-free zones* 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 georeferenced map with the treatment boundary, *streams*, fishery sensitive zones, known PFZs, non-classified drainages, *wetlands*, and lakes and any other resource to be managed will be provided to the contractor for all *cutblocks*.

5.6 Equipment Maintenance and Calibration

The application contractor shall ensure that the equipment is in good working order and if required, is calibrated to conform to the application rates on the *pesticide* label. Proper calibration is important to ensure *herbicide* is not under or over applied. Records will be kept by the contractor for each piece of calibrated equipment for a minimum of 2 years.

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

The applicator will follow the calibration instructions in the Standard Practices for *Pesticide* Applicators (WorkSafe BC 2009) and page C1 of the MoF *Herbicide* Field Handbook (Boateng 2002). Equipment will be calibrated:

- for each individual applicator using hand-held or backpack equipment
- at the beginning of each season
- at the start of each new treatment area
- any time the application equipment is changed or repaired
- for each change in size or type of nozzle
- any time the *pesticide* or formulation of a *pesticide* is changed

5.7 Pesticide Notices

Treatment signs will be posted prior to project commencement at all road or trail accessible points to the treatment area. The signs must be clearly legible and will remain in place for a minimum of 14 days following treatment.

The signs will conform to section 63 of the Integrated Pest Management Regulation and will include:

- Date and time of application
- Confirmation number
- Pesticide trade name or active ingredient
- Precautions to be taken to prevent harm to people entering the treatment area
- Address and phone number for more information

5.8 Weather Monitoring

The following weather measurements or items will be recorded for foliar treatment methods:

- Wind speed and direction
- Relative humidity
- Precipitation
- Temperature
- Presence of frost or dew
- Sky conditions

Foliar treatments will be stopped if:

- Temperature is below freezing or above 30 degrees Celsius
- Wind velocity exceeds 8km/hr or wind is blowing towards adjacent non-target or “sensitive” areas
- Relative humidity is less than 30%
- Snow, heavy dew, or ice covers vegetation
- When raining
- When precipitation is predicted within 6 hours following foliar *herbicide* application (or per manufacturer’s label)
- Foggy weather and inadequate daylight for safe application

Basal bark spray application will be stopped if water is running down the stem or if snow is above treatment height. Weather readings will be recorded and kept for 3 years following project completion.

Note: Where applicable and if necessary, the TFL 44 GP automated weather stations can provide additional information.

6. FORESTRY HERBICIDES

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

Table 2: Pesticides

Trade Name	Active Ingredient	Manufacturer	PCP No.	Treatment Types
Garlon XRT Garlon RTU Release Silvicultural Release MSO	Triclopyr	Corteva Agriscience*	#28945 #29334 #22093 #28431	Basal Bark Spray
VisionMax Silviculture	Glyphosate	Monsanto Canada	#27736 #19899	Ground Foliar Spray

VP480 Vantage XRT		Corteva Agriscience*	#28840 #29994	
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*Corteva Agriscience products are registered under Dow AgroSciences Canada Inc

Foliar Spray and **Basal Bark Spray** applications utilize a motorized or manually operated backpack sprayer.

Other Substances

The following substances may be used in *pesticide* work:

- Halt – Reduces foaming during foliar spray treatments
- IsoparM – Increases herbicide spread-ability during basal bark applications
- Light Neutral Oil 100R – Reduces volatility of IsoparM on hot days (>26degrees)
- Sylgard 309 – Increases herbicide penetration.
- Gateway Adjuvant- Improves spreading and uptake of herbicide products.

Product Labels and up to date Safety Data Sheets for the pesticides and other substances are available on the manufacturer's website or Health Canada's website: <https://pr-rp.hc-sc.gc.ca/lr-re/index-eng.php>.

GLOSSARY

Basal bark spray	<i>Application of the herbicide Release® onto the bark at the base of tree stems.</i>
Biodiversity	<i>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.</i>
Biogeoclimatic	<i>A system of ecosystem classification used in British Columbia to describe forest ecosystems; forest classification based on climax vegetation</i>
Browse control or browse guarding	<i>Actions employed to limit eating of crop trees by deer, elk or pikas by using cones, cages, fencing or repellents</i>
Buffer zone	<i>Area of no direct pesticide application designed to ensure that a PFZ or sensitive area remains pesticide free</i>
Conifer	<i>Trees with cones; most Coastal species are evergreens</i>
Cutblock	<i>setting; harvested area; management unit for tracking most treatment information.</i>
Coppices	<i>Re-growth that arises from the stumps of some species of trees</i>
Deciduous	<i>Tree species that lose their foliage in the fall</i>
DBH	<i>Diameter at breast height</i>
Ecosystem	<i>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.</i>
Environmental Management System (EMS)	<i>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.</i>
Forest Professional	<i>A professional forester or professional forest technician registered in BC with the Association of BC Forest Professionals.</i>
Free growing	<i>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.</i>
Ground foliar	<i>Application of a herbicide to foliated vegetation using backpack sprayers</i>
Herbicide	<i>A pesticide used to control or manage vegetation</i>
Mechanical damage	<i>Scarring or deformation of tree stems due to snow, wind and rubbing action from adjacent plants</i>
Microsite	<i>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.</i>
Pest	<i>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.</i>

Pesticide	<i>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.</i>
Pesticide Free Zone	<i>(PFZ) An area of land that must not be treated with pesticide and must be protected from pesticide moving on to it.</i>
Pest Management Plan	<i>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.</i>
Selective application	<i>The application of a pesticide to individual plants so that the vegetation between individual plants is not treated. (BC MoE, 2005)</i>
Silviculture	<i>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.</i>
Silviculture Instruction	<i>A document that summarizes the Biogeoclimatic site classification of the harvest area, including the pre-harvest stand and vegetation description, soil data, elevation, aspect, slope, planting prescription, forest health hazards and vegetation severity hazard rating.</i>
Silviculture system	<i>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.</i>
Site Plan	<i>Silviculture prescription (PHSP; pre-harvest silviculture prescription prior to 1995); document that summarizes the resources and planned management of a forest prior to logging.</i>
Site preparation	<i>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.</i>
Sph	<i>Stems per hectare</i>
Stocking	<i>The amount of trees on an area. Usually expressed as stems per hectare (sph)</i>
Stock type	<i>The type and size of the tree seedlings prescribed for reforestation</i>
Stream	<i>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)</i>
Surfactant	<i>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.</i>
Thinline	<i>Basal bark application of the herbicide Release®, at a concentration of 100%, to the stem of Big-leaf maple using a squirt bottle</i>

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

Treatment Thresholds

Target Competitive Vegetation Species			Preferred Treatment Technique		Alternative Treatment Technique	
Species	Density Threshold	Competition Threshold	Chemical	Manual	Chemical	Manual
Red Alder	>200 sph or as determined by forestry professional	Impediment to Free Growing status	-	Power saw cutting	Basal bark spray (Triclopyr)	Girdling if DBH > 15cm or +3m tall
Bitter Cherry	As determined by forestry professional	Impediment to Free Growing status	-	Power saw cutting	-	-
Big Leaf Maple	>10 sph or as determined by forestry professional	Impediment to Free Growing status	Basal bark spray (Triclopyr)	Power saw cutting (single stem)	-	-
Willow and Dogwood	As determined by forestry professional	Impediment to Free Growing status	-	Power saw cutting	Basal bark spray (Triclopyr)	
Salmonberry, Elderberry and Thimbleberry	Rarely required, as determined by forestry professional	Taller than crop tree and expected to cause crop tree mortality due to mechanical damage and limited light	-	Power saw cutting	-	-
Bracken Fern and Fireweed	Rarely required, as determined by forestry professional	Taller than crop tree and expected to cause crop tree mortality due to mechanical damage and limited light	-	Manual stem bending	-	-
Knotweeds	All identified areas	All identified areas	Foliar spray (Glysophate)	-	-	-
Scotch Broom, Gorse	Rarely required, as determined by forestry professional	Taller than crop tree and expected to cause crop tree mortality due to mechanical damage and limited light	Foliar spray (Glysophate)	-	-	-

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 affects;
- 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.

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.

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.

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 replaced 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

Newspaper Advertisement



DEVELOPMENT OF A PEST MANAGEMENT PLAN

Pest Management Plan Reference Number: TFL44GP.PMP.1.2021-26

Applicant: TFL 44 General Partner, 1080A Franklin River Road, Port Alberni, B.C V9Y 7N3

Primary Contact: Marissa Hallaway, RPF mhallaway@westernforest.com or 250-720-4216

TFL 44 Limited Partnership is developing a Pest Management Plan (PMP). The PMP contains a description of a vegetation management program that utilizes the principles of integrated pest management, including the use of herbicide and non-herbicide methods. The proposed plan applies to harvested areas within Tree Farm License 44 on southern Vancouver Island to the south, west and northwest of Port Alberni. The duration of the PMP is for five years from approximately May 15th, 2021 to May 15th, 2026.

Herbicide use in the area to which the PMP applies is minimized as much as possible by utilizing non-herbicide methods, such as power saw cutting or girdling. However, herbicides may be used where these methods are not effective.

The herbicides proposed for use under this plan include:

Triclopyr – Garlon XRT, Garlon RTU, Release MSO, Release Silviculture

Glysohate – Vantage XRT, VP480, VisionMax Silviculture

The application method for herbicides with the Triclopyr as the active ingredient is basal bark spray. The application method for herbicides with Glysohate as the active ingredient is ground foliar spray. Note that there will be NO AERIAL HERBICIDE APPLICATIONS.

A copy of the Draft Pest Management Plan document Overview Map of the possible treatment areas may be viewed for 30 days from the publication of this notice at TFL 44 General Partner's office and online at <http://www.westernforest.com/wiwag/activities.htm>. Please call or email any questions, requests for additional information, or to book an appointment. Contact information and office address are listed above. Covid-19 protocols will be in place.

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