



Pest Management Plan for Invasive Alien Plant and/or Noxious Weed Control on Provincial Crown Lands Within South Coastal British Columbia

BC Ministry of Forests and Range

PMP Application #: MFR-HRA-IAPP 2008

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Table of Contents

Executive Summary	-----	5
1.0 Introduction	-----	6
1.1 Purpose and Objectives of this PMP	-----	6
1.1.1 Purpose	-----	6
1.1.2 Objectives	-----	6
1.2 Identifying Information	-----	7
1.2.1 Identification of Plan Holder	-----	7
1.2.2 Geographic Boundaries and Description of the PMP Area	-----	7
1.3 Use of This Plan on Provincial Crown Land	-----	8
1.4 Term of Plan	-----	8
1.5 Person Responsible for Managing Invasive Plants	-----	8
1.6 Public Use Within the Plan Area	-----	9
2.0 Invasive Plants, Noxious Weeds, and Invasive Alien Plants	-----	9
2.1 Invasive Plant General Characteristics	-----	10
2.2 How Invasive Plants Are Spread	-----	10
2.3 The Need to Control Invasive Plants	-----	10
3.0 The Integrated Invasive Plant Management Program	-----	11
3.1 Prevention (Planning)	-----	12
3.2 Pest Identification	-----	13
3.2.1 Available Resources for Invasive Plant Identification	-----	14
3.3 Conducting Inventories and Monitoring Pest Populations	-----	14
3.3.1 Conducting Invasive Plant Inventories/Surveys	-----	14
3.3.2 Monitoring Invasive Plant Populations	-----	16
3.4 Establishing Injury Levels and Treatment Thresholds	-----	16
3.4.1 Establishing Injury Levels	-----	17
3.4.1.1 Prioritizing Invasive Plant Sites	-----	17
3.4.1.2 Priority Invasive Plant Species	-----	18
3.4.2 Establishing Treatment Thresholds	-----	19
3.5 Pest Treatment Options and Treatment Method Selection	-----	20
3.5.1 Treatment Method Selection	-----	20
3.5.2 Pest Treatment Options	-----	21
3.5.2.1 Manual and Mechanical Control	-----	21
3.5.2.2 Cultural Control	-----	23
3.5.2.3 Biological Control Agents	-----	23
3.5.2.4 Selective Spot Applications of Herbicides	-----	24
3.6 Post Treatment Evaluations	-----	25
4.0 Operational Information	-----	26
4.1 Qualifications and Responsibilities of Persons Applying Herbicides	-----	27
4.2 Procedures for Safely Transporting Herbicides	-----	27
4.3 Procedures for Safely Storing Herbicides	-----	28
4.4 Procedures for Safely Mixing, Loading and Applying Herbicides	-----	28
4.5 Procedures for Safe Disposal of Empty Herbicide Containers and		

PMP for Invasive Alien Plant and/or Noxious Weed Control on Provincial Crown Lands for South Coastal BC

	Unused Herbicides -----	29
4.6	Procedures for Responding to Herbicide Spills -----	29
4.7	Identification of Each Herbicide That Will Be Used Under the Plan, The Manner of Its Application, and the Type of Equipment Required For Each Manner of Application -----	30
4.7.1	Description of Application Equipment Proposed for Use -----	31
5.0	Environmental Protection Strategies and Procedures -----	31
5.1	Strategies and Procedures to Protect Community Watersheds -----	32
5.2	Strategies and Procedures to Protect Domestic and Agricultural Water Sources -----	32
5.3	Strategies for Protecting Fish and Wildlife, Riparian Areas, Bodies of Water and Wildlife Habitat -----	33
5.4	Strategies to Prevent Herbicide Contamination of Food Intended for Human Consumption -----	34
5.5	Pre-Treatment Inspection Procedures for Identifying Treatment Area Boundaries -----	35
5.6	Procedures for Maintaining and Calibrating Herbicide Application Equipment -----	35
5.7	Procedures for Monitoring Weather Conditions and Strategies for Modifying Herbicide Application Methods for Different Weather Conditions -----	36
6.0	Reporting, Notification and Consultation -----	36
6.1	Reporting -----	36
6.1.1	Confirmation Holder Use Records -----	37
6.1.2	Annual Report for Confirmation Holders -----	37
6.2	Notifications -----	38
6.2.1	Notification of PMP Confirmation -----	38
6.2.2	Annual Notice of Intent to Treat -----	38
6.2.3	Requests to Amend the PMP -----	38
6.2.4	Notification of Contraventions -----	39
6.2.5	Public Notification Prior to Treatment -----	39
6.2.6	First Nations Notification Prior to Treatment -----	39
6.2.7	Employee Notification Prior to Treatment -----	39
6.2.8	Posting of Treatment Notices -----	40
6.3	Consultations -----	40
6.3.1	Public Consultation Plan -----	40
6.3.2	Public Consultation Report -----	41
6.3.3	First Nations Consultation Plan -----	41
6.3.4	First Nations Consultation Report -----	42
6.3.5	Interagency Consultation and Coordination -----	42

Appendices

Appendix 1	Map of PMP Area -----	44
Appendix 2	Site and Invasive Plant Inventory Record -----	45
Appendix 3	Equipment Calibration and Checklist Record -----	46
Appendix 4	Example of a Treatment Notice -----	47

Figures

Figure 1 The IPM Steps for an Effective Invasive Plant Management Program ----- 12

Tables

Table 1 Web Sites for Invasive Plant Identification and Information ----- 14

Table 2 Invasive Plant Site Risk Categories ----- 17

Table 3 Invasive Plant Species Priority Classes ----- 18

Table 4 List of Current Priority Invasive Plant Species ----- 19

Table 5 Control Strategy Rationale by Site Risk Category and Species Priority Class- 20

Table 6 General Conditions Associated with Treatment Options ----- 21

Table 7 Herbicide Active Ingredients Proposed for Use, Their Manner of 31

 Application, and the Equipment Required for Their Application -----

Table 8 Minimum Protective Measures Under the IPMR to Protect Domestic and 33

 Agricultural Water Sources -----

Table 9 PFZ Requirements Under the IPMR When Applying Herbicides for 34

 Invasive Plant Control-----

Executive Summary

An invasive alien plant is any plant species that has the potential to pose undesirable or detrimental impacts to our economy, human health, animals or ecosystems. Current threats posed by existing and potential invasive plant species are significant and growing tremendously. Invasive plants are a profound threat to biodiversity, and, in some cases, human health. Once introduced and established, these plants with no natural predators, (having originated from some other part of the world), can channel all of their energy into proliferation and aggressively out-compete native plants that underpin and sustain our natural ecosystems. The socio-economic impacts to the province are large too. Therefore, efforts to reduce these cumulative impacts are best achieved through an integrated approach of prevention and control on provincial Crown land that occupies approximately 94% of the total land base in British Columbia.

This Pest Management Plan (PMP) was developed by the Invasive Plant Program of the Ministry of Forests & Range (MFR), Range Branch to directly address the issue at hand. It has been developed in accordance with the *Integrated Pest Management Act* and its accompanying regulations. This PMP outlines an integrated pest management (IPM) approach for the control of invasive alien plants and noxious weeds, which includes prevention strategies, biological and cultural controls, manual/mechanical treatment methods and strategically-targeted, judicious use of herbicide on provincial Crown lands under the authority of the partnering agencies – the Ministry of Transportation and Infrastructure, the Ministry of Environment, the Ministry of Agriculture and Lands, and the Ministry of Forests & Range.

This PMP covers the treatment of invasive alien plants and/or noxious weeds on provincial Crown land within the geographic area defined by the Coastal Invasive Plant Committee (CIPC) – Vancouver Island, the Gulf Islands and the Regional Districts of Capital, Cowichan Valley, Alberni-Clayoquot, Comox Valley, Strathcona, Powell River and Mount Waddington. This area encompasses a diversity of ecosystems ranging from dry, open Garry oak meadows, to wet, closed-canopy rainforests and alpine areas. This area of coastal BC is home to nearly one million people, numerous community watersheds, vast timber, agricultural and recreational values, as well as endangered native species and plant communities, critical wildlife habitats values and unparalleled biodiversity. These are the values that the PMP aims to conserve.

In British Columbia, legislation exists that requires land occupiers to control such problematic plants. The *Forest and Range Practices Act* and accompanying Invasive Plant Regulation requires the prevention of the introduction or spread of 42 named species. The *Weed Control Act/Regulation* requires that land occupiers, as defined in the Act, control noxious weeds on both private and Crown land and has named 21 noxious plant species on their Provincial list. There are also species listed in the Community Charter Regulation, and other species that are as yet unlegislated, that have associated detrimental impacts. This PMP will target only high priority invasive plants. The principal goal however, is to prevent the introduction of such plants, and reduce the spread of existing plant populations, to minimize the impacts to high risk sites (i.e. ecologically important natural areas) within this geographical area.

1.0 Introduction

Section 24(2)(g) of the Integrated Pest Management Regulation (IPMR) requires the preparation of a Pest Management Plan (PMP) for herbicide use for the management of noxious weeds and invasive plants on more than 50 hectares a year of public land (e.g. provincial Crown land). To date, there has never been an invasive plant PMP prepared for provincial Crown land for south coastal British Columbia (BC).

A PMP means a plan that describes:

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

1.1 Purpose and Objectives of this PMP

1.1.1 Purpose

The primary purpose in developing this PMP is to provide a single document that describes a multi-agency approach/planning process, using the principles of integrated pest management (IPM), that will both ensure the effective management of invasive plants on provincial Crown lands within south coastal BC while also protecting environmental and human health values.

1.1.2 Objectives

The objectives of this PMP are to ensure:

- Legal accountability with the provisions of the *Integrated Pest Management Act (IPMA)* and IPMR, as well as applicable federal, provincial and local government laws and regulations;
- The responsible use of herbicides;
- The incorporation and use of the principles of IPM;
- Public and First Nations awareness of, and input into, invasive plant management at the landscape level;
- That the effective use of an IPM program takes into account environmentally sensitive areas and land uses; and,
- That there is continued investigation into alternative non-chemical methods of invasive plant management while recognizing that for several species, herbicide use may be the only reasonably practical means of control.

Under this PMP, existing populations of invasive alien plants may not necessarily be treated, but rather, kept from expanding further (i.e. beyond a defined containment line). The focus of treatments is leading edges or gaps between treatment areas that pose risk of further spread into high priority sites.

The following treatments/methods are strictly **excluded** from this PMP:

PMP for Invasive Alien Plant and/or Noxious Weed Control on Provincial Crown Lands for South Coastal BC

- Potentially problematic native plant species such as salmonberry, alder, or other brush species. Only alien plants that are either invasive or noxious will be targeted;
- Silvicultural treatments (to rid plants that compete for light and resources with tree seedlings);
- Cosmetic (i.e. control of weeds for aesthetic purposes) or nuisance weeds; and,
- Aerial spraying via helicopter, fixed-wing plane or applications by truck-mounted boom for invasive alien plant and/or noxious weed control.

1.2 Identifying Information

1.2.1 Identification of Plan Holder

The PMP holder will be the BC Ministry of Forests & Range (MFR).

1.2.2 Geographic Boundaries and Description of the PMP Area

The plan area will be specific only to provincial Crown land within the geographical area defined by the CIPC. Specifically:

- Vancouver Island and the Gulf Islands; and;
- The Regional Districts of Capital, Cowichan Valley, Alberni-Clayoquot, Comox Valley, Strathcona, Nanaimo, Powell River and Mount Waddington.

A map showing the geographic boundaries of the areas covered by this PMP is shown in Appendix 1.

The plan area also encompasses areas/lands under the jurisdiction of the following “partnering agencies”:

- The BC Ministry of Transportation and Infrastructure’s (MoT) Service Areas 1,2,3 and part of 5;
- 222 Protected Areas Division [BC Ministry of Environment (MoE)] areas that include Conservancy Areas, Ecological Reserves, Protected Areas, Provincial Parks, Wildlife Management Areas, transfers of administration and control, and acquisitions within applicable districts of the Vancouver Island and Lower Mainland Regions;
- The BC Ministry of Forests & Range (MFR): South Island Forest District, Campbell River Forest District, North Island-Central Coast Forest District and the Sunshine Coast Forest District (excluding the “Sechelt side”); and,
- The BC Ministry of Agriculture and Lands (MAL), including lands under the jurisdiction of the Integrated Land Management Bureau (ILMB) and the Crown Land Administration Division (CLAD).

The plan area contains a diverse array of natural areas including forested, grassland, alpine, subalpine, riparian and marine/estuarine ecosystems. Within this area, resource use includes, but is not limited to, conservation uses (e.g. wildlife enhancement or protection), grazing, parks and recreation, and community watershed protection. Invasive plants can negatively impact these

areas. Therefore, having a management plan to address both the prevention and treatment of these species, when they occur, is essential to the management of these lands. Provincial Crown land is also immediately adjacent to private land throughout the region and co-ordination through the CIPC (the regional weed committee) and local governments is seen as integral to the overall success of the program.

1.3 Use of This Plan on Provincial Crown Land

Many areas of provincial Crown land under the jurisdiction of MoT and MFR, road systems in particular, serve as vectors of spread of invasive plants into MoE parks, conservancies, and protected areas. Transportation corridors (e.g. roads and highways) and recreational sites (e.g. BC Parks facilities) are generally recognized as principal areas from which invasive plants can spread to adjacent high-risk sites (e.g. sensitive terrestrial ecosystems). Consequently, control of invasive plants in these areas is a critical component of a regional approach to successful invasive plant management.

In addition to MFR conducting invasive plant inventory/activities within their own lands under this PMP, partnering agencies can conduct (or allow to be conducted by MFR), invasive plant inventory/activities on areas/land over which they have jurisdiction (as outlined in Section 1.2.1), as well as implement control measures on its own lands, provided that the following are adhered/committed to:

- Compliance with the contents of, and commitments made in, the PMP; and,
- Compliance with the requirements contained in the *IPMA*, *IPMR*, and other applicable legislation (e.g. the Park Act and the Ecological Reserve Act).

1.4 Term of Plan

This plan shall be in force for a five-year period from the date that Confirmation of a Pesticide Use Notice has been obtained from the MoE.

1.5 Person Responsible for Managing Invasive Plants

The person responsible for coordinating the management of invasive plants under this PMP, and the principal contact for information related to this plan is:

Jeff Hallworth, P.Ag
Coastal Invasive Plant Specialist
Ministry of Forests and Range, Range Branch
4885 Cherry Creek Road, Port Alberni, BC, V9Y 8E9
Tel: (250) 731-3087 Fax: (250) 731-3010
E-mail: Jeff.Hallworth@gov.bc.ca

1.6 Public Use Within the Plan Area

The principal land uses within the PMP area are: forestry, agriculture, aquaculture, mining, recreation, hunting, fishing and medicinal and food plant gathering. Substantial timber harvest levels support several sawmills and pulp mills. Aquaculture tenures result in considerable activity along coastlines and inlets. The area is also well known for its land and water based recreational activities. There are also many high use Provincial Parks and Protected Areas including conservation areas, conservancies, recreation areas, resort tenures, and forestry recreation sites that are popular tourism destinations. Hunting, fishing and non-consumptive activities like hiking, nature photography, boating and research activities are also popular. Provincial Crown land is also used for harvests of medicinal and food plants, as well as fur bearing animals.

2.0 Invasive Plants, Noxious Weeds, and Invasive Alien Plants

The Invasive Plant Council of BC defines invasive plants as: “Any invasive alien plant species that has the potential to pose undesirable or detrimental impacts on humans, animals or ecosystems.”

Invasive alien plants are non-native plants that have found their way into BC. They are both an ecological and economic problem for our province. Without the insect predators or plant pathogens that naturally control them in their native habitats, they can quickly spread out of control. In Europe, many of these plants evolved in an ecosystem filled with disturbance while our native plants evolved with minimal disturbance. These non-native plants may have an advantage over our native plants on disturbed sites. Often, they exhibit aggressive growth and out-compete crops and native plant species, adversely affecting economic and natural resources. The resulting invasion can reduce recreational and crop values, displace native vegetation (and therefore forage for wildlife and livestock), reduce biodiversity including species at risk, and damage native ecosystems.

Problems caused by invasive alien species have increased dramatically in recent decades, due in part to growth and spread of human populations. Population growth leads to greater disturbance of the land, increased demand for food and fiber, overuse of public land for recreation and commercial production, increased international travel, and globalization of world trade. All of these encourage the introduction, establishment, and spread of invasive alien plant species.

Definitions

Invasive plant - a plant that aggressively forms monocultures and can cause social, economic or environmental harm. It is a species that may also be listed under the *Forest & Range Practices Act* (FRPA), Invasive Plant Regulation, administered by MFR.

Noxious weed – any weed designated by regulation to be noxious under the BC *Weed Control Act* (WCA) and Regulations, administered by the BC Ministry of Agriculture and Lands (MAL).

Alien - plant did not exist in coastal BC prior to European settlement and/or its natural range did not include coastal BC historically

In the context of this PMP, the term “invasive plant” will be used to include both alien plants and noxious weeds.

2.1 Invasive Plant General Characteristics

Invasive plants have varying characteristics that permit them to rapidly invade new areas and out-compete native plants for light, water, and nutrients. Some of these characteristics include:

- Early maturation;
- Profuse reproduction by seeds and/or vegetative structures;
- Specially adapted seeds to assist their movement by wind, water or wildlife;
- Prickles, spines, thorns, or sap that can cause physical injury and repel animals;
- The ability to parasitize other plants;
- Allelopathy (production of chemicals that inhibit the growth of other plants); and,
- High photosynthetic rates.

2.2 How Invasive Plants Are Spread

Although wind, water, domestic and wild animals can disperse invasive plant seeds, human activity is generally found to be the primary cause of invasive plant introductions and/or spread. Invasive plants have been shown to introduced and/or spread by the following activities:

- Construction and maintenance on transportation and utility corridors, rail lines, ship yards, highways, pipe lines and power lines, moving and transporting soil and fill;
- Forestry operations (e.g. road/landing/skid trail building and maintenance, machinery movement during harvesting, post harvest site preparation, log hauling);
- Range activities (e.g. grazing, herding livestock, and building of stock trails, water developments and corrals);
- Mining operations (e.g. road building and maintenance, movement of machinery, creation of permanent openings in the forest canopy cover);
- Horticultural practices (e.g. importation and planting of plant species which over time become invasive, careless disposal of garden refuse, unintentional seed introduction in soil); and,
- Recreational activities (e.g. disturbance of soil by all terrain vehicles (ATV) and other recreational activities, spread of invasive plants by recreational vehicles and boats, and the dumping of aquatic plants into watercourses).

2.3 The Need to Control Invasive Plants

Invasive plants are able to establish quickly and out-compete native plants; some of which are rare and endangered. Many invasive plants have short life cycles, while others are extremely long-lived (e.g. broom, gorse and holly may live for 50 years or more, and their seed bank may remain viable for decades). This allows such plants to germinate, grow and set seed while environmental conditions are favourable. Some invasive plant species further increase their advantage over native species by producing toxins that inhibit the growth or establishment of other plants. Because they are introduced, these species have no natural predators in these environments, thus giving them a further advantage over native species.

Invasive plants can cause ecological problems by:

- Competing with native vegetation for light, moisture and nutrients;
- Causing declines in biodiversity;
- Altering nutrient and hydrological cycles;
- Reducing soil productivity by affecting mycorrhizal fungi or changing or changing chemistry (allelopathic chemicals);
- Negatively affecting the habitats of rare and endangered species;
- Reducing the quality and quantity of forage for grazing and browsing wildlife and livestock;
- Reducing food supplies for many plant-feeding insects;
- Decreasing water quality and fish habitat;
- Changing ecological community structure and function;
- Increasing wildfire hazard;
- Dominating sites for prolonged periods after establishment (altering the ecosystem components); and,
- Hindering restoration efforts and increasing costs to rehabilitate disturbed ecosystems.

3.0 The Integrated Invasive Plant Management Program

This section deals specifically with the objectives and steps for managing invasive plants on south coastal provincial Crown land using the principles of IPM.

This PMP aims to achieve effective, long-term invasive plant prevention and management compatible with both the legislated mandate(s) for their control, and the needs of humans, animals, plants, and environmental resources at and beyond the treatment site. No single tactic can solve a current invasive plant problem or prevent future infestations; therefore it is often necessary to combine several treatment methods into an IPM program.

IPM is a decision making process for determining what actions will be taken when pest problems occur. In IPM programs, all available information is considered in order to manage pest populations effectively in an environmentally sound manner. Preventing organisms from becoming pests, by keeping them at some acceptable level (i.e. below a level that causes damage), is generally the first step in an IPM program. When applied appropriately, this process will result in improved management, lower costs, ease of maintenance, and lower environmental impacts from control activities.

Successful implementation of an IPM program requires:

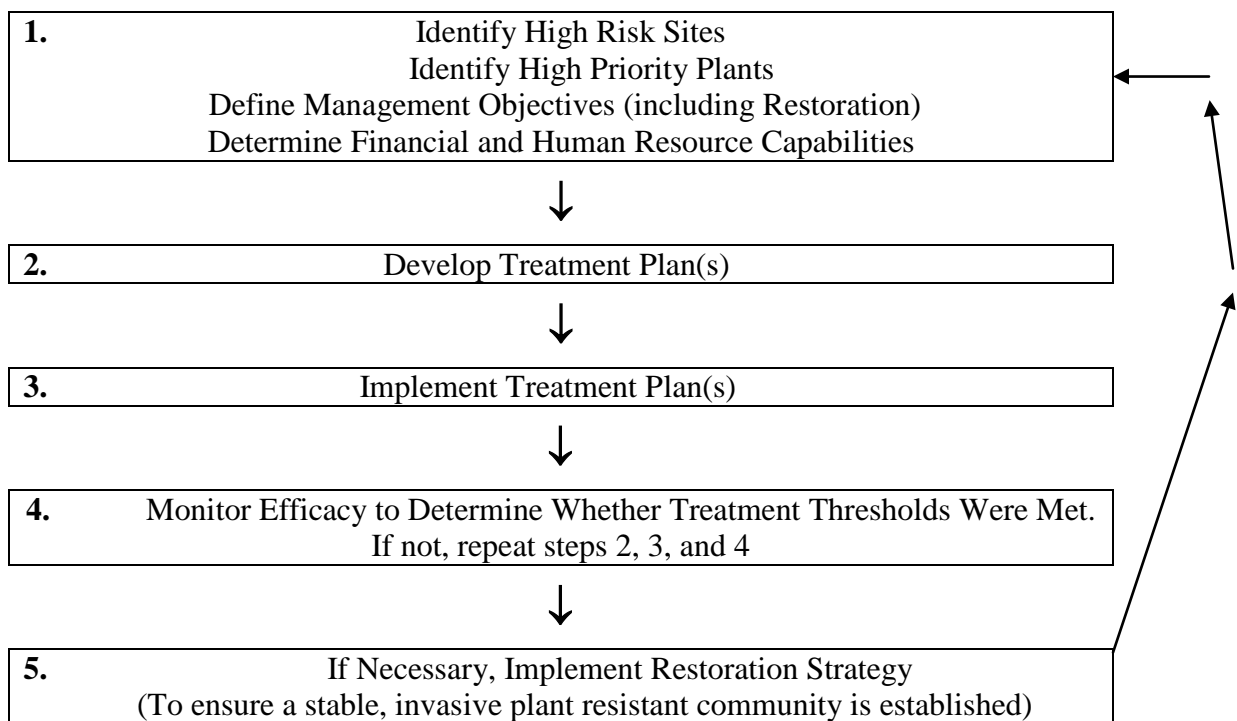
- Multiple-tactic, monitoring-based, prevention-oriented management;
- Extensive communication and cooperation among federal and provincial agencies, First Nations, local governments, private industry, and landowners;
- Implementing public education programs (e.g. in cooperation with the CIPC); and,
- Continued initiative and innovation by invasive plant managers.

The elements of an IPM program for this PMP are:

- **Prevention (Planning);**
- **Pest Identification;**
- **Conducting Inventories/Surveys and Monitoring Pest Populations;**
- **Establishing Injury Levels and Treatment Thresholds;**
- **Pest Treatment Options and Treatment Method Selection; and,**
- **Post-Treatment Evaluations.**

MFR [and MoE (Protected Areas Division), MAL, and MoT, who may be authorized to conduct activities under this plan] are committed to the principles and practice of IPM, and the implementation of the IPM steps as outlined on the following diagram in their integrated program to manage invasive plants:

Figure 1: The IPM Steps for an Effective Invasive Plant Management Program



3.1 Prevention (Planning)

Preventing the initial establishment and spread of invasive plants is the single, most effective, and often most overlooked method of invasive plant control. Invasive plants will invade those areas that provide suitable habitat for their survival and proliferation. This includes, for example, soils disturbed through road or recreational trail development, right of way disturbances for fence construction, and timber harvesting. For these reasons it is important to clean equipment, livestock and outer clothing and footwear to prevent the introduction of invasive plant seeds to non-infested sites. Another important method to prevent the introduction of invasive plants is to minimize soil disturbance where there is a potential invasive plant seedbed. Intact or pristine ecosystems in the south coastal BC are generally resistant to invasive plants. Most invasive plant species are excluded from mature forests by virtue of

PMP for Invasive Alien Plant and/or Noxious Weed Control on Provincial Crown Lands for South Coastal BC

their wide, dense canopies that limit the establishment of understory vegetation. Susceptible habitats are created when forest openings occur, typically associated with resource extraction, urbanization or by natural disturbance (e.g. erosive forces). Prompt seeding of disturbances is an important tool to prevent the establishment of invasive plants, as well as minimizing soil erosion.

The partnering agencies will be working closely with the CIPC, who is responsible for promoting education in order to encourage prevention techniques such as deferred or rotational grazing, water conservation, erosion control, proper fertilization, re-seeding to maintain dense, hardy grass cover, re-vegetation in disturbed areas and in invasive plant treatment areas, and maintaining native vegetation that can successfully compete and thereby reduce invasive plant establishment. Further information on education and preventative measures can be obtained from the CIPC web site at:

<http://www.coastalinvasiveplants.com>

The following are examples of land management practices that, if implemented, can help prevent invasive plant establishment and/or inhibit invasive plant growth. The MFR (and those ministries authorized to undertake invasive plant control under this PMP) will implement the following practices, as applicable, on a site-specific basis:

- Prevent the movement of soils contaminated with invasive plant seed and vegetative plant parts (e.g. gravel pit material used in road construction and maintenance, yard and garden waste dumping);
- Educate roadside mower, excavator and grader operators on work practices that will reduce spreading invasive plant seeds and plant parts;
- Keep equipment yards and storage areas free of invasive plants;
- Inspect clothing and vehicle/equipment undercarriages when working in, and prior to leaving, areas known to contain invasive plants;
- Remove (by cleaning or washing) plant seeds or plant parts from clothing and equipment, dislodging and containing associated water, mud and dirt;
- Keep roadside infestations sufficiently away from road surfaces so that plant parts or seeds are not inadvertently transported to uninfested areas;
- Keep equipment out of infested areas; and,
- Proactively re-vegetate disturbed areas adjacent or known to be at risk to invasive plant establishment using an appropriate combination of scarification, seeding with a native grass seed mixture that is predominately free of invasive plant seeds (e.g. using a coastal native grass seed or a coastal agronomic seed that is a grade of Common #1 Forage Mixture or better), and fertilizing and/or mulching during road, landing and skid trail construction or maintenance, or site preparation.

3.2 Pest Identification

The accurate identification of invasive plants is important for the following reasons:

- To conduct invasive plant inventories and to monitor invasive plant populations;
- Control may or may not be required, depending on the plant's growth stage, physical location, degree of invasiveness, and how widespread it is; and,

- Control methods may differ depending on the plant species. Some may be easily controlled by non-chemical methods, but others may only be effectively managed through a combination of chemical and non-chemical methods.

3.2.1 Available Resources for Invasive Plant Identification

For invasive plant management, it is important to have a basic understanding of plant biology, including knowledge of growth stages, life cycles and classification, so that the safest, most appropriate and effective control methods may be used. There are numerous publications that will assist in the identification of invasive plants. Fact Sheets (including Weed Alerts), guidebooks and brochures, and web based information will all assist in the identification, management and control of invasive plants. The table below indicates some of the web sites where information on invasive plant identification can be accessed:

Table 1: Web Sites for Invasive Plant Identification and Information in BC

CIPC	http://www.coastalinvasiveplants.com
BC Ministry of Agriculture and Lands	www.weedsbc.ca www.agf.gov.bc.ca/cropprot/weeds.htm www.agf.gov.bc.ca/cropprot/weedguid/weedguid.htm
Invasive Plant Council of BC (Fact Sheets)	www.invasiveplantcouncilbc.ca/compendium/browse.php?q=Fact%20Sheet

3.3 Conducting Inventories and Monitoring Pest Populations

An inventory of invasive plant species within the plan area is required to address resource impacts of invasive plants and to effectively plan provincial, regional, and district invasive plant containment and control strategies. Monitoring invasive plant species (especially priority species) through regular inspections is an essential planning and prevention tool. The data obtained from the invasive plant monitoring inspections is needed to determine what action is required, if any, to reduce the possibility of their long-range spread and to determine post-treatment effectiveness.

3.3.1 Conducting Invasive Plant Inventories/Surveys

Currently, invasive plant inventory data pertaining to provincial Crown land within the PMP area is housed within MFR’s Invasive Alien Plant Program (IAPP) Application. This comprehensive database contains and allows for extraction of relational (data and statistics) and spatial (mapping) information, and can be accessed at the following web site:

<http://www.for.gov.bc.ca/hra/Plants/application.htm>

Invasive plant inventories/surveys will generally focus on invasive plant species listed under *FRPA*, Invasive Plant Regulation, the *WCA* and Regulations, the *Community Charter Act*, and

PMP for Invasive Alien Plant and/or Noxious Weed Control on Provincial Crown Lands for South Coastal BC

priority species as deemed by the CIPC (some of which are yet to be regulated by provincial legislation).

Invasive plant inventories/surveys will be conducted in accordance with the methodology outlined in the IAPP Application reference guides.

Inventories/surveys may be conducted by truck, ATV, motorbike, bicycle, boat, or on foot depending on access to the area, the level of detail required, and budget. Efforts are made to choose the method that will have the least impact on the land base. For example, when conducting inventories/surveys in endangered Garry oak ecosystems, it is advisable to proceed by foot to reduce impact and disturbance.

Once the inventory/survey area is determined, those roads, trails and areas that are likely to be susceptible for invasion by the target species will be surveyed more closely. Many dry land invasive species tend to invade grasslands and forest openings while riparian invasive species prefer lakeshores, ponds, sloughs, creeks, river edges, marshes and seepage areas. A review of each invasive species' biogeoclimatic zone/subzone preferences may also assist in focusing survey efforts, and experience with site series or plant associations is beneficial. Areas that have been recently disturbed or that receive disturbance on a regular basis are carefully inventoried/surveyed, as they are generally the preferred habitats of invasive species. Such areas may include, but are not limited to:

- Roadsides, ditches, pullouts and landings;
- Recreation sites;
- Openings in the forest canopy;
- Burned areas;
- Air strips;
- Gravel pits;
- Areas where vehicle traffic and loading/unloading is common;
- Areas that are/have been over-grazed, and areas of heavy livestock and/or wildlife use;
- Areas where there has been recent development, or construction sites where machinery has been present; or,
- Any other areas where human activity or natural disturbance may increase the likelihood of invasive plant introduction, establishment and spread.

When a target species is detected, the information is recorded on a *Site and Invasive Plant Inventory Record* (see Appendix 2). If it is a new site, then information specific to the site is recorded as well as for the invasive plant found at the site. If the site is an existing site, then only the Site ID and data specific to the survey of any invasive plant infestation found will be recorded.

The information collected (and recorded) for an invasive plant site shall include the UTM coordinates (northing, easting and zone), location, date, species, size of infestation (ha), distribution, density, any pertinent site characteristics or additional information, and site photos. If the surveyor is unable to correctly identify a particular plant species as an "invasive alien", a sample will be taken for proper identification.

3.3.2 Monitoring Invasive Plant Populations

MFR staff and contractors monitor target invasive plants on a regular basis. Monitoring priority invasive plant species through regular inspections is an essential planning and prevention tool. The data from monitoring inspections will be used to determine what action is required, if any, to reduce the possibility of long range spread.

Monitoring consists of an ongoing assessment of sites, regularly inspecting potential infestations that may require treatment. Invasive plant details will be documented using MFR's *Site and Invasive Plant Inventory Record* to an **operational** or **precise** standard (refer to the Inventory & Monitoring Reference Guide). Information available in the IAPP Application will focus monitoring efforts on high priority species in or adjacent to high-risk sites.

Monitoring provides a record of information about invasive plant occurrence, density, and site conditions. Monitoring is done visually and critical observations are recorded. All sites will be assessed before treatment decisions are made. Pre-treatment evaluations will be conducted to monitor site conditions and to ensure that the proposed treatment is the most effective for the targeted vegetation. Treatment timing is especially important if herbicides will be used. The effectiveness of many herbicides depends on the growth stage and condition of the target plants. Ensuring that herbicide applications are as effective as possible will help reduce the need for future herbicide use at a site.

Using its own internal standards, MFR will maintain site integrity by routinely inspecting and monitoring invasive plant sites for potential or existing problems. Invasive plants that threaten public safety are high priority species. Sites are monitored based on a rotational cycle. Species composition, projected growth rates, site location, and human and financial resources will determine this cycle.

3.4 Establishing Injury Levels and Treatment Thresholds

Invasive plant management is a process that continues over many years. Managers are continually prioritizing treatment areas and balancing the priorities with their resources. This process is called "setting treatment action levels." When the invasive plant population reaches a level that can no longer be tolerated, action is taken to manage/control it. The decision to take action and apply control measures is based on the information gathered from a monitoring program. Treatments are not made in accordance with a predetermined schedule, but rather when and where monitoring reveals that they are needed. All management decisions are made on a site-specific basis to the variation of physical, environmental and other factors in the south coastal region. In essence, no two sites are the same. Determining when treatments are needed involves two concepts – establishing the injury level and the treatment threshold.

Definitions

Injury level - the level after which the growth of a given weed population at a specific site will cause some unacceptable impact e.g. to public safety, recreation, natural or managed ecosystems.

Treatment threshold - the level when a particular treatment should be applied in order to keep a given plant population at a given site from reaching the injury level.

3.4.1 Establishing Injury Levels

Establishing the injury level involves **prioritizing invasive plant sites** and **prioritizing invasive plant species**.

3.4.1.1 Prioritizing Invasive Plant Sites

In invasive plant management, a species is only as important as the site that it occupies or threatens to occupy. Everything relates to site.

Invasive plant sites are categorized at both the landscape and local levels as shown in the following table:

Table 2: Invasive Plant Site Risk Categories

Site Risk Category	Landscape Level Criteria	Local Level Criteria
HIGH	Driest, most light-dominated and human populated coastal BEC ¹ zones: CDFmm and CWHxm1 and xm2 (low elevation, rain shadow areas)	Sensitive Ecosystem Inventory (SEI) Polygons ² , uncultivated agricultural areas, recreational areas, estuaries, riparian areas, ecologically sensitive terrestrial areas, open forest, wetland, lakes
MODERATE	Mesic BEC zones: CWHds, CWHdm, CWHmm, CWHwh, CWHvh, and CWHvm (ranked from driest to wettest)	Other
LOW	BEC zones that are the wettest, darkest, and have the most extreme temperature variability: CWHms, CWHws, CWHmm, CWHwh, and AT coastal (high elevation and windward areas)	Other

¹ Definitions and descriptions of the BEC (Biogeoclimatic Ecosystem Classification) zones and subzones shown in the above table can be found by consulting the following web site:

<http://www.for.gov.bc.ca/hre/becweb/resources/classificationreports/subzones/index.html>

² Definitions and descriptions of SEI (Sensitive Ecosystem Inventory) Polygons described in the above table can be found by consulting the following web site: <http://www.env.gov.bc.ca/sei/>

Situations that may increase site risk are:

- A recent invasion or discovery of a small "outlier" population of a high priority plant beyond the previously known spatial distribution of this species or at the headwater of an ecologically important watercourse; or,

- The discovery that an invasive plant population has become a threat (e.g. to agriculture, native plants, food sources for wildlife, highway safety or water resources).

3.4.1.2 Priority Invasive Plant Species

Invasive plant species are ranked by priority classes, as shown in the following table:

Table 3: Invasive Plant Species Priority Classes

A – moderately to highly invasive species that are moderately to very difficult to manage (and/or legislated)
B – low to moderately invasive species that are moderately to difficult to manage (and/or legislated)
C – low invasive potential species that are moderately difficult to manage (may be legislated)
D – low invasive potential species that are easily managed (may be legislated)

Generally only plant species within Priority Classes A & B (i.e. those species that are the considered the most invasive and most difficult to manage, and that lie directly within or immediately adjacent to high risk sites) will be considered for treatment under this PMP. These plants will, for the most part, coincide with those occurring both on the *FRPA*, Invasive Plants Regulation and the *WCA/* Regulation, but are not limited to these.

It must be noted that if new information becomes available and/or new species of invasive plants (i.e. “new invaders”) are identified at a site, the invasive plant site risk category is subject to change.

For purposes of this PMP, the following table illustrates a listing of coastal priority invasive plant species. These plants are generally both highly invasive (i.e. rapidly form monocultures and can cause social, economic or environmental harm) and are considered difficult to manage.

It must be noted, however, that this list is neither exhaustive nor is it static. As new priority invasive plant species are identified within the PMP area during the 5-year period that this PMP is confirmed for, they will be incorporated into this list:

Table 4: List of Current Coastal Priority Invasive Plant Species

Bohemian Knotweed	Giant Knotweed	Portuguese Broom
Bull Thistle	Gorse	Purple Dead Nettle
Butterfly Bush	Goutweed	Purple Loosestrife
Canada Thistle	Hairy Cat's Ear	Reed Canary Grass
Carpet Burweed	Henbit (Common Dead Nettle)	Rush Skeletonweed
Common Burdock	Herb Robert	Scentless Chamomile
Common Tansy	Himalayan Blackberry	Scotch Broom
Cordgrasses (Spartina sp.)	Himalayan Knotweed	Scotch Thistle
Crupina	Hoary Alyssum	Spanish Broom
Cutleaf Blackberry	Japanese Knotweed	Spotted Knapweed
Dalmation Toadflax	Leafy Spurge	Spurge Laurel (Daphne)
Dame's Rocket	Meadow Hawkweed	St. John's Wort
Diffuse Knapweed	Meadow Knapweed	Sulphur Cinquefoil
English Hawthorn	Milk Thistle	Tansy Ragwort
English Holly	Old Man's Beard	Teasel
English Ivy	Orange Hawkweed	Wild Chervil
Flowering Rush	Oxeye Daisy	Yellow Archangel
French Broom	Periwinkle	Yellow Flag Iris
Garlic Mustard	Poison Hemlock	Yellow Starthistle
Giant Hogweed	Policeman's Helmet	Yellow Toadflax

3.4.2 Establishing Treatment Thresholds

With some applications, the treatment threshold may be reached when the plant population has reached unacceptable numbers. For other types of controls (e.g. biological controls), the treatment might be applied at a stage in the plant's life cycle, rather than at a particular population level. Some treatments are better suited to dealing with large plant populations for reasons of economies of scale. In some cases there may be no tolerance for any invasive plants species at all (i.e. zero treatment threshold), and in other cases the number of invasive plants that can be tolerated before control measures are considered may be much greater. This decision relates directly to the sites threatened by or occupied by a priority invasive plant (e.g. a site with a rare and endangered plant species or plant community may prompt a treatment decision at low invasive plant population levels). Ideally, treatments are executed when invasive plant population levels are low; long before the injury threshold is reached, thereby reducing expenses and the unnecessary introduction of treatment agents into the environment. Regardless, setting treatment thresholds is often a function of the available financial and human resources.

Invasive plant site risk categories (at both the landscape and local levels) and species priority classes are reviewed annually by the MFR's Coastal Invasive Plant Specialist and Technician, in consultation with the CIPC, to develop treatment plans. The following table illustrates the various combinations of site risk categories and species priority classes used to establish a control strategy/treatment priority. The number of sites and allocation of funding will be the principal drivers of the overall program control strategy.

Table 5: Control Strategy Rationale by Site Risk Category and Species Priority Class

Site Risk Category - Landscape Level	Site Risk Category - Local Level	Species Priority Class	Control Strategy
High	Sensitive Ecosystem Inventory (SEI) Polygons, uncultivated agricultural areas, recreational areas, estuaries, riparian areas, ecologically sensitive terrestrial areas, open forest, wetland, lakes	A, B	Extirpation (through directed treatments on leading edges adjacent to high risk local sites)
Moderate	Other	B, C	Containment
Low	Other	C, D	Management

Definitions:

Extirpation - is the permanent removal of 100% of an invasive plant species from a selected site. This is usually only attainable for a small isolated patch/clump of an invasive plant or noxious weed species.

Containment - is to keep a species population within a defined geographic line or outside of an established boundary. Containment will occur when there are a few localized occurrences that must be kept from expanding farther, to new locations, essentially breaking over the defined line. Preventing or reducing access to areas with invasive plant infestations is also a strategy employed in containment.

Management - is used where there are widespread incidences of a species. Treatments are focussed to where the impacts would be greatest, if the species were left unchecked. Management aims to reduce invasive plant population sizes to such a level that they have a limited impact on the environment and economy. Biological control is an example of a management approach that may be utilized against an appropriate invasive plant species where infestations are widespread and beyond eradication and containment capabilities by conventional methods of treatment. Most coastal species will fall under the management strategy.

3.5 Pest Treatment Options and Treatment Method Selection

Treatment occurs only when **monitoring** indicates **thresholds** have been reached and **treatment** is necessary. Several methods are selected from educational, biological, cultural, manual, mechanical, and chemical control tactics, and then integrated into a treatment program. Vigilant record keeping is cornerstone to the program’s success. The provincial IAPP Application is where records are and will be kept: <http://www.for.gov.bc.ca/hra/Plants/application.htm>

3.5.1 Treatment Method Selection

The integration of a number of treatment strategies into an IPM program has been shown to be more effective than using a single option alone. Generally, no individual method will control in a single treatment. The success of different treatment methods depends on the type of invasive plant you are trying to control, as the choice of a treatment method(s) generally relates to specific

invasive plant characteristics. Treatment selection is based on information compiled from invasive plant and site monitoring results.

General conditions associated with use of treatment options are shown in the following table:

Table 6: General Conditions Associated with Treatment Options

Treatment	Conditions for Use
Manual and Mechanical (e.g. covering/smothering, cutting, digging/excavating, girdling, hand pulling, mowing, pruning, stabbing, tilling, spot burning (flaming))	<ul style="list-style-type: none"> • new, small incursions generally readily available to equipment • used to limit rhizomatous root spread to prevent seed production • generally applicable to all species • generally requires restoration (to some extent) with native grasses and plant species
Cultural (i.e. targeted grazing by sheep or goats)	<ul style="list-style-type: none"> • incursion size is variable, otherwise similar to mechanical treatments
Biological (i.e. systematic release of insects that feed exclusively on targeted invasive plant species)	<ul style="list-style-type: none"> • older, more established incursions generally with widespread occurrences of target species beyond treatment site • currently only applicable to thistles, knapweeds, toadflaxes, tansy ragwort, leafy spurge and St. John’s wort within the PMP area
Chemical (i.e. judicious, strategically targeted use of herbicides)	<ul style="list-style-type: none"> • incursion size is variable • woody plants are generally treatable with the active ingredient triclopyr, herbaceous plants are generally treatable with the active ingredients glyphosate or aminopyralid • restricted use within close proximity to: species at risk, domestic water intakes, water licenses, agricultural food production systems, environmentally sensitive or riparian areas, pesticide free zones (PFZ), no treatment zones (NTZ), or public use areas.

Other considerations include seasonality, weather conditions, financial and human resources, site accessibility, site conditions, target species composition and percent cover, and the consequences of not treating.

3.5.2 Pest Treatment Options

IPM involves the use of different techniques to control invasive plants. When treatment thresholds are met or surpassed, the following treatment option or options will be considered:

- Manual and mechanical and control (**non-chemical**);
- Cultural control (**non-chemical**);
- Use of biological control agents (**non-chemical**); and,
- Selective and spot applications of herbicides (**chemical**).

3.5.2.1 Manual and Mechanical Control

Manual and mechanical control methods that may be used in the integrated invasive plant management program include:

- Covering/Smothering;
- Cutting;
- Digging/Excavating;
- Girdling;
- Hand pulling;
- Mowing;
- Pruning;
- Stabbing;
- Tilling; and
- Spot burning (Flaming).

Rationale, Selection Criteria, and Benefits of Using Manual and Mechanical Control

Manual and mechanical methods of invasive plant control:

- Are effective and environmentally safe methods if timed correctly and precautions are taken to minimize soil disturbance and native vegetation loss in the treatment area;
- Are sometimes the only available techniques for invasive plant control in areas where herbicides cannot be used (e.g. first option to be considered when in close proximity to environmentally sensitive features);
- Are sometimes an effective approach to reduce invasive plants or reduce their movement off site;
- Are rarely used when eradication of invasive plants is the goal, but can weaken the population and/or reduce their spread to new sites; and,
- Have only small and short-term impacts on fish and wildlife.

Limitations of Manual and Mechanical Control

- Mowing is less effective on low-growing plants that are growing beneath the mowing height, and can result in more stems being produced (because it cuts the tops of plants, allowing more buds to grow), and cannot be done when flower-feeding bio-control agents are working on a site;
- Cutting effectiveness is largely dependant on the plant species, stem diameter, time of cut, and age of the plant;
- Flaming can pose safety issues for both workers and the environment;
- Some invasive plant species respond favourably to burning and/or mowing;
- Covering/smothering can be very costly and labour intensive, as treatment sites require regular monitoring to detect and repair torn material(s);
- Excavating can be very costly and labour intensive as complete removal of all root fragments must be obtained to prevent re-growth; and,

- Restoration, including prompt re-establishment of native vegetation, is highly recommended to prevent erosion and the re-establishment of invasive plants; and repeated follow-up treatments must be conducted to remove all new germinants, often for 3-5 years, sometimes longer.

Disposal of Invasive Plants/Plant Parts Following Manual or Mechanical Treatments

Proper disposal of invasive plants or invasive plant parts following manual or mechanical control is very important. As a general rule, invasive plants, plant parts and seeds should be bagged and disposed of in a landfill or other designated disposal site. Information on proper disposal for specific invasive plant species can be found at the Invasive Plant Council of BC web site:

<http://www.invasiveplantcouncilbc.ca/resources/targeted-invasive-plant-solutions-tips>

3.5.2.2 Cultural Control

Targeted grazing is the only cultural control method that may be used in the integrated invasive plant management program.

Rationale, Selection Criteria, and Benefits of Using Targeted Grazing

Targeted grazing (e.g. using goats or sheep) for invasive plant control:

- Is economical and does not pose the environmental dangers of applying herbicides;
- May retard plant development and seed formation and gradually deplete root reserves (by the continual grazing of the tops of young plants); and,
- May be a viable option for control of certain species of invasive plants in areas where manual or mechanical methods or herbicides cannot be used;

Limitations of Targeted Grazing

- Is a “non-selective treatment” therefore sometimes native or desirable vegetation is eaten in conjunction with the targeted invasive plants; and,
- Animal husbandry and transportation costs can be prohibitive.

3.5.2.3 Biological Control Agents

It is the intent of the MFR to introduce biological control agents when and where appropriate to reduce invasive plant populations. Biological control agents (predominately insects) are released to attack and weaken target invasive plant species and over time reduce their population size.

A complete listing of biological control agents that are in general use, and those being developed for invasive plants in British Columbia is available on-line at:

<http://www.for.gov.bc.ca/hfp/biocontrol/index.htm>

Rationale, Selection Criteria, and Benefits of Using Biological Control Agents

- Have proven effective to reduce herbicide use and also achieve long-term control on sites with well-established invasive species populations;
- Are typically utilized in areas where invasive plant infestations and distribution are too extensive to be reduced effectively by other treatment methods;
- Once established, provide an inexpensive, long-term, and non-toxic means to control weed populations;
- Field releasing is relatively inexpensive and scheduling with other duties keeps release and monitoring costs low;
- Reduce invasive plant populations below a level where significant environmental or economic damage occurs; and,
- There are very few known worker and public safety issues associated with releasing biological control agents.

Limitations on Using Biological Control Agents

- After their introduction, biological control agents can take 5 to 10 years to become established and increase to numbers large enough to cause damage to the target plants;
- Ongoing monitoring is required to determine establishment, dispersal and impact on invasive plant populations;
- Does not result in elimination of the invasive plant species from sites;
- Some specialized equipment and training is required for transporting, releasing, distributing and monitoring biological control agents;
- Costs to study, rear and screen agents for release are very high;
- Biological controls not available for all invasive plant species; and,
- Some uncertainty as to whether native flora and fauna are impacted by release of biological agents.

3.5.2.4 Selective and Spot Applications of Herbicides

All herbicide applications under this PMP will be selective or spot applications to targeted invasive plants, with an emphasis on using herbicide application reduction over time. Existing populations of invasive plants may not necessarily be treated, but rather, prevented from expanding further (i.e. beyond a defined containment line). The focus of treatments will be on “leading edges” (i.e. perimeter edges) or gaps between treatment areas that pose risk of further spread into priority sites.

Herbicide use is considered to be the last resort under this PMP (i.e. used only if no other method is practical or effective). Application techniques will be selected that minimize injury to non-target plants and soils through spray drift and leaching in soils. Consequently, applications by stem injection, wick/wipe on, and by squirt bottles will be the used where practical.

Where practical, herbicides containing the active ingredients glyphosate, triclopyr or aminopyralid will be the preferred herbicide applied under this PMP for the eradication or containment of priority invasive plant species, at high-risk sites, or where other control options have proven ineffective.

Many herbicides have been shown to be effective for invasive plant control at application rates recommended on the label. Where proven effective through research, lower application rates may be used to protect certain values, such as impacts to the environment. At no time will herbicides be applied at application rates higher than those specified on their respective labels.

Rationale, Selection Criteria, and Benefits of Using Selective and Spot Applications of Herbicides

- Herbicides offer a useful tool that can be integrated with other invasive plant management techniques;
- With the exception of biological control agents, the economic costs of treating many invasive plant sites with herbicides may be significantly lower than other treatment methods;
- It is very unlikely that manual, mechanical or cultural techniques alone will be effective at achieving the required level of control to reduce the spread of invasive plants and manage existing infestations at priority sites due to their specialized biology and persistence;
- The use of herbicides applied at prescribed label application rates will provide excellent control of target invasive plants (i.e. listed on the label); and,
- The degradation of habitat as a result of invasive plant infestations (i.e. “biological pollution”) may exceed degradation resulting from judiciously applied, targeted use of specific herbicides (that readily breaks down in the environment).

Limitations on Using Selective and Spot Applications of Herbicides

- With the exception of herbicides containing the active ingredient glyphosate, herbicides cannot be applied to invasive plants growing within 10 meters of water bodies, dry streams, or classified wetlands;
- At least one follow-up application is generally required to give total control of most invasive plant species; and,
- Exposure to herbicides may present a risk to workers, the public and untargeted species of plants and animals (e.g. wildlife).

3.6 Post Treatment Evaluations

Selected treatment sites will be inspected/evaluated to ensure:

- Compliance with the commitments made in this PMP;
- Compliance with the *IPMA* and *IPMR*;
- The required level of control was achieved by the treatment; and,
- Information is collected and shared.

PMP for Invasive Alien Plant and/or Noxious Weed Control on Provincial Crown Lands for South Coastal BC

Agency staff or qualified contractors will undertake post-treatment monitoring at selected treatment sites, and records of the data collected will be entered into the IAPP Application.

When evaluating the results of both chemical and non-chemical controls, the following information/data shall be collected (by visual observations) and recorded:

- Whether the control technique(s) chosen provided acceptable control;
- Whether environmentally sensitive areas were adequately protected;
- Whether the established PFZs and NTZs were appropriate for the treatment method used;
- Whether there was any observable off-site herbicide movement or impact on surrounding or adjacent non-target vegetation or soils in the area;
- Whether the herbicide application rate needed to be adjusted based on the results;
- Whether there was re-growth of invasive plants treated by manual or mechanical methods;
- Whether there was need for follow-up treatments at the site;
- The cost-effectiveness of the treatment program;

The timing and procedure for evaluating specific treatment programs will depend on the treatment method. Agencies operating under this PMP shall take reasonable efforts to ensure that treatment sites are evaluated within one year of the treatment.

The success of biological control releases will be evaluated for agent establishment within 2 years after release for applicable species. Once establishment is verified on a site, assessment of dispersal and efficacy of the agent will also be assessed.

Agencies operating under this PMP may also conduct “during treatment” inspections of both herbicide applications and/or manual/mechanical treatments being conducted under this PMP. These inspections may assess, for example, public and worker safety, environmental concerns, completion schedules and adherence to standards, specifications and the commitments made in this PMP.

4.0 Operational Information

The operational information included in this section includes:

- Qualifications and responsibilities of persons applying herbicides;
- Procedures for safely transporting herbicides [**IPMR Section 58(3)(a)(i)**];
- Procedures for safely storing herbicides [**IPMR Section 58(3)(a)(ii)**];
- Procedures for safely mixing, loading and applying herbicides [**IPMR Sections 58(3)(a)(ii) and (iii)**];
- Procedures for the safe disposal of empty herbicide containers and unused herbicides [**IPMR Section 58(3)(a)(iv)**];
- Procedures for responding to herbicide spills [**IPMR Section 58(3)(a)(v)**]; and,
- Identification of each pesticide that will be used under the plan, the manner of its application, and the type of equipment required for each manner of application [**IPMR Section 58(3)(c)**].

4.1 Qualifications and Responsibilities of Persons Applying Herbicides

The transportation, storage, handling, application and disposal of pesticides are governed by federal and provincial legislation. MFR, MoE, MAF, and MoT personnel and their contractors will follow safe handling practices including workplace requirements for Workplace Hazardous Materials Information System (WHMIS) labeling and worker education. The required practices for pesticide applicators are detailed in:

- Worker's Compensation Board of British Columbia (1998) *Occupational Health and Safety Regulation – BC Regulation 296/97 as amended by BC Regulation 185/99 – Sections 6.70 to 6.109*;
- BC Ministry of Environment, Lands and Parks (2005) *Handbook for Pesticide Applicators and Dispensers*; and,
- Workers' Compensation Board of British Columbia (1990) *Standard Practices for Pesticide Applicators*.

All herbicide applications under this PMP will be conducted or supervised by a person who holds a Pesticide Applicator Certificate endorsed for the class of pesticide and the pesticide use required under this PMP.

The responsibilities of the Certified Pesticide Applicator are to:

- Be in continuous attendance at the site;
- Have available proof of certification;
- Supervise no more than 4 uncertified assistants at one time;
- Maintain continuous contact, auditory and/or visual, with the uncertified assistants;
- Be within 500 meters of persons being supervised; and,
- Comply with the standards contained in Division 7 of the IPMR.

4.2 Procedures for Safely Transporting Herbicides

The Transport of Dangerous Goods Act regulates the handling and transportation of poisonous substances that may include herbicides. The *IPMA and IPMR* also specify certain transport requirements/procedures.

The plan holder shall ensure that ministry personnel and/or contractors follow these procedures for safely transporting herbicides with the Plan Area:

- Ensure that herbicides are carried in a compartment that is secured against spillage and unauthorized removal. The compartment shall be separate from food and drinking water, safety gear, spill containment equipment and people;
- Ensure that all herbicide containers are inspected for defects prior to transporting. Herbicides shall be kept in their original containers and with original labels. If original labels are not

available, the herbicides shall be placed in appropriate containers that have the trade name, active ingredient concentration and pesticide registration number affixed to the outside of the container;

- Ensure that the vehicle is equipped with a first aid kit, fire extinguisher, spill contingency plan and kit, and that the vehicle operator has been trained on how to handle spills;
- Ensure that all documents and placards are carried in, or placed on, transport vehicles if required under the *Transportation of Dangerous Goods Act*, the *IPMA* or the *IPMR*; and,
- Ensure that the vehicle operator reads and understands the herbicide labels and the product Material Safety Data Sheet (MSDS) for all herbicides being transported.

4.3 Procedures for Safely Storing Herbicides

The plan holder shall ensure that ministry personnel follow these procedures for safely storing herbicides with the Plan Area:

- Ensure that herbicides are stored in accordance with the *IPMA*, *IPMR* and the Workers' Compensation Board document *Standard Practices for Pesticide Applicators*;
- Keep herbicides in their original containers and with original packaging. If original packaging is not available, the herbicides shall be placed in appropriate containers that have the trade name, active ingredient concentration and pesticide registration number affixed to the outside of the container;
- Ensure that storage facilities are locked when left unattended, ventilated to the outside atmosphere, are entered only by persons authorized to do so, and that there is a placard affixed and maintained on the outside of each door leading into the storage area bearing, in block letters that are clearly visible, the words "WARNING – CHEMICAL STORAGE – AUTHORIZED PERSONS ONLY";
- Keep storage facilities separate from work and living areas, and away from food, flammable materials, bodies of water and water sources;
- Ensure the storage facility is equipped with necessary spill equipment, first aid kits, and the appropriate Material Safety Data Sheets of herbicides stored;
- Ensure that the person responsible for the storage area notifies the appropriate fire department of the presence of herbicides on the premises; and,
- Ensure that herbicides that release vapors, and bear a "poison" symbol on the label are stored in a storage facility that is not attached to or within a building used for living accommodation.

The plan holder has no direct control of the herbicide storage practices of its contractors while they are not under contract to them. Some contractors may store herbicides for extended periods of time in vehicles when performing a number of herbicide treatments for the plan holder(s). The contractor's vehicle is considered a mobile storage unit. Persons responsible for the herbicide storage shall ensure that all herbicides are stored in a locked canopy or similar arrangement, separate from the driver and personal protective gear.

4.4 Procedures for Safely Mixing, Loading and Applying Herbicides

The plan holder shall ensure that ministry personnel and/or contractors follow these procedures for safely mixing, loading and applying herbicides with the Plan Area:

- Ensure that all mixing, loading and application of herbicides is carried out by, or directly supervised by, a Certified Pesticide Applicator with the appropriate category of certification, and that all manufacturer's recommendations, as specified on the herbicide labels, are adhered to;
- Ensuring that all mixing, loading and application of herbicides are undertaken in a safe manner. All mixing and loading shall be undertaken only in areas at least 15 meters from, and selected to prevent, any spilled herbicides from entering pesticide-free zones, no treatment zones, bodies of water, fish or wildlife habitat, water sources, or other environmentally sensitive features (e.g., agricultural production areas);
- Ensure that containers used to mix, prepare or apply herbicides are not washed or submerged in any body of water;
- Ensure that eye wash station(s), protective clothing, safety spill kits, spill response plans, a copy of this integrated vegetation management plan, each herbicide product's MSDS, emergency telephone numbers and first aid supplies are present and available at or near each mixing, loading or treatment site. This will help ensure that quantities of herbicides being mixed and used are consistent with labels;
- Follow all directions and restrictions on herbicide product labels, including adhering to the recommended re-entry times to treated areas unless personal protective equipment is worn; and,
- Ensure that the listed herbicides in this PMP will only be mixed with water to dilute herbicide concentrations.

4.5 Procedures for Safe Disposal of Empty Herbicide Containers and Unused Herbicides

Except where herbicides are applied by plan holder(s) personnel, the responsibility of container disposal will lie with the contractor.

The plan holder shall ensure that ministry personnel and/or contractors follow these procedures for the safe disposal of empty herbicide containers and unused herbicides with the Plan Area:

- Ensure that all herbicide waste is disposed of in a manner consistent with the requirements of the *BC Environmental Management Act*, Special Waste Regulation, and in accordance with the manufacturer's instructions as noted on the product label, as appropriate;
- Ensure that empty herbicide containers are returned to the herbicide distributor as part of their recycling program; or triple rinsed or pressure rinsed, altered so that they cannot be reused, and disposed of in a permitted sanitary landfill or other approved disposal site; and
- Ensure that all leftover herbicide mix is stored for future use in a manner consistent with the requirements specified in Section 5.3 (procedures for safely storing herbicides).

4.6 Procedures for Responding to Herbicide Spills

The plan holder shall ensure that ministry personnel and/or contractors follow these procedures for responding to herbicide spills within the Plan Area. If contractors that work under this PMP have their own spill response plan, they must meet or exceed the following plan:

PMP for Invasive Alien Plant and/or Noxious Weed Control on Provincial Crown Lands for South Coastal BC

- Ensure that a herbicide spill kit accompanies all vehicles within the plan area, and contains, as a minimum, the instructions for spills, emergency telephone numbers, agricultural white lime (25 kg.), kitty litter (2-20 kg. bags), large plastic garbage bags (4), shovels (2), Nutrasol pesticide neutralizing solution (1), an ABC type fire extinguisher, polyethylene or plastic tarp (3 m x 3m minimum), dustpan and shop brush, flagging and rope, a herbicide first aid kit, and personal protective clothing/equipment (rubber gloves, safety glasses); and,
- Ensure that the following spill procedures are followed if a herbicide spill occurs within the plan area:
 1. All personnel shall be protected from herbicide contamination by wearing appropriate protective clothing and safety gear;
 2. Any person exposed to a herbicide shall be moved away from the place of the spill;
 3. First aid should be administered, if required;
 4. The source of the spill should be stopped;
 5. The spilled material should be stopped from spreading by creating a dam or ridge;
 6. The project supervisor shall ensure operations cease until the spill is contained and the source is repaired;
 7. Absorbent material shall be spread over the spill, if applicable, to absorb any liquid;
 8. The absorbent material shall be collected in garbage bags or containers with the contents clearly marked, removed from the spill site, and placed in garbage bags or containers;
 9. When more than one litre of herbicide is spilled, the person responsible for the project will immediately report it to the Provincial Emergency Program by telephoning 1-800-663-3456 or, where that is impractical, to the local police or nearest detachment of the R.C.M.P.; and,
 10. An approved representative of the plan holder(s) will be notified of the details related to the spill as soon as is practical by the contractor project supervisor.

4.7 Identification of Each Herbicide That Will Be Used Under the Plan, the Manner of Its Application, and the Type of Equipment Required for Each Manner of Application

The three (3) herbicide active ingredients proposed for use under this PMP, their manner of application, and the type of equipment required for each manner of application are outlined in the following table. It must be noted that each herbicide active ingredient listed in this table may be registered for sale and use in Canada as one or more products (e.g. the active ingredient glyphosate is currently available in over 120 registered products). Any or all products that are registered for sale or use in Canada, and that contain the one or more of the active ingredients proposed for use, may be used within this PMP:

Table 7: Herbicide Active Ingredients Proposed for Use, Their Manner of Application, and the Equipment Required for Their Application

Active Ingredient	aminopyralid	triclopyr	glyphosate
Manner of Application	spot treatment onto foliage	spot treatments to plant leaves or stems (e.g., basal bark), direct application or injection onto or into freshly cut stumps or stems	spot treatments onto foliage, direct application to plant leaves, direct application or injection onto or into freshly cut stumps or stems
Equipment Required for Application	backpack sprayer, ATV/quad	wick/wipe on, backpack sprayer, ATV/quad, squirt bottle, or injection tool	wick/wipe on, backpack sprayer, ATV/quad, squirt bottle, or injection tool

4.7.1 Description of Application Equipment Proposed for Use

The following is a description of each type of application equipment proposed for use under this PMP:

Backpack Sprayer: A portable, manually operated, low pressure container with a nozzle and a positive shut-off system used for the spot application of herbicides onto foliage, basal bark areas, or into or onto freshly cut stems and stumps.

ATV/Quad: A motorized vehicle equipped with a pump, holding tank for spray mix, and a nozzle (low pressure) used for the spot application of herbicides onto foliage.

Wick/Wipe On Applicators: Absorbent pad, wicks or rope attached to a long-handled applicator or stick used to apply herbicides onto foliage, basal bark areas, or freshly cut stems or stumps.

Squirt Bottle: Hand-held, non-pressurized container used to apply herbicides onto basal bark areas, or freshly cut stems or stumps.

Injection Tools: Used to inject herbicides into individual stems.

5.0 Environmental Protection Strategies and Procedures

All invasive plant management activities proposed for use under this PMP will incorporate:

- Strategies to protect community watersheds;
- Strategies to protect domestic and agricultural water sources;
- Strategies to protect fish and wildlife, riparian areas, bodies of water and wildlife habitat;

- Strategies to prevent herbicide contamination of food intended for human consumption;
- Pre-treatment inspection procedures for identifying treatment area boundaries;
- Procedures for maintaining and calibrating herbicide application equipment; and
- Procedures for monitoring weather conditions and strategies for modifying herbicide application methods for different weather conditions.

In this PMP, all PFZs and NTZs will comply with the standards contained in Division 7 of the IPMR.

5.1 Strategies and Procedures to Protect Community Watersheds

Under this plan, herbicide applications proposed to occur within 100 meters of a community watershed boundary will, if applicable, abide by the following strategies and procedures:

- The location of community watersheds to be protected will be verified by accessing the Community Watershed Database, maintained by the BC Ministry of Environment, at the following web site;

http://www.env.gov.bc.ca/wsd/data_searches/comm_watersheds/index.html

- Herbicides shall not be stored within a community watershed for more than 24 hours prior to their use, and removed from the community watershed within 7 days of use, unless they are stored in a permanent structure;
- A 10 meter PFZ shall be maintained from the point of herbicide application and all bodies of water within the community watershed;
- A 30 meter PFZ shall be maintained down slope from the point of herbicide application and all licensed water intakes within the community watershed;
- A 100 meter PFZ shall be maintained upslope from the point of herbicide application and all licensed water intakes within the community watershed;
- All PFZs shall be measured and marked/flagged prior to herbicide use; and
- Herbicide use shall be discontinued if herbicide residues or breakdown products are detected at a community watershed water intake, and further use shall not be undertaken until the BC Ministry of Health Services, medical health officer, has been satisfied that all required measures have been implemented to preserve water quality.

5.2 Strategies and Procedures to Protect Domestic and Agricultural Water Sources

The plan holder shall ensure that prior to herbicide applications for invasive plant management, strategies are developed and implemented that identify and protect domestic and agricultural water sources. The table below describes the minimum protective measures that shall be implemented. The NTZs in this table reflect the standards as specified in Sections 71(3) and 71(4) of the IPMR.

Table 8: Minimum Protective Measures Under the IPMR to Protect Domestic and Agricultural Water Sources

IPMR Section	Uses	Permitted Applications	NTZ
71(3)	All pesticide applications except bacterial pesticides	General Rule – Must maintain a 30 m NTZ around a water supply intake or well used for domestic or agricultural purposes, including water for livestock and irrigation purposes	30 m NTZ
71(4)	All pesticide applications except bacterial pesticides	May reduce the NTZ under section 71(3) if reasonably satisfied that the smaller zone will ensure that pesticide from the use will not enter the water supply intake or well	NTZ at discretion of applicator

Definition: **No-treatment zone (NTZ)** – an area of land that must not be treated with pesticides. NTZs will be identified, marked/flagged prior to any herbicide application.

The plan holder shall ensure that, prior to herbicide applications for invasive plant management, the locations of registered domestic and agricultural water sources shall be verified visually and/or by assessing applicable government web sites. Attempts to identify and locate unregistered domestic and agricultural water sources will be made by visual observations and/or by attempting to contact the owner/occupier of the land prior to herbicide applications.

5.3 Strategies for Protecting Fish and Wildlife, Riparian Areas, Bodies of Water and Wildlife Habitat

In order to protect fish and wildlife, riparian areas, bodies of water and wildlife habitat from adverse effects during invasive plant management (chemical and non-chemical), the plan holder will implement the following strategies to minimize any adverse and lasting effects on natural ecosystems:

- Ensure that whenever herbicide, manual or mechanical control methods are applied, efforts are made to eliminate harmful alteration, damage or destruction to fish or their habitat. Reducing negative impacts on streamside vegetation and bank stability will reduce erosion and water turbidity. To prevent contamination of water in fish bearing streams, glyphosate will not be applied to ditches that flow directly or indirectly into fish bearing streams;
- Ensure that where sensitive ecosystems or 'at risk' plant, vertebrate or invertebrate species have been identified in higher-level plans, wildlife management areas, and other plans, they will be managed accordingly within the PMP;
- Ensure that whenever control methods involving herbicide application are proposed in areas identified as Karst lands, that the Best Management Practices specific to herbicide applications, as identified in the MFR publication entitled “*Karst Management Handbook for British Columbia*”, are adhered to (<http://www.for.gov.bc.ca/hfp/publications/00189/Karst-Mgmt-Handbook-web.pdf>);

PMP for Invasive Alien Plant and/or Noxious Weed Control on Provincial Crown Lands for South Coastal BC

- Ensure that there is communication with agencies responsible for species at risk prior to invasive plant management being carried out, so that protective measures may be implemented, where possible;
- Ensure that best management strategies (as derived from documents on species habitat, lifecycle information and locations) are practiced during invasive plant management;
- Hold pre-work meetings with plan holder(s) personnel and/or contractors and affected agencies to ensure all involved in the invasive plant management process can competently protect species at risk, riparian areas, bodies of water and wildlife habitat during the course of the work.
- In order to reduce invasive plant control impacts on fish and wildlife, riparian areas and wildlife habitat, ensure that contract documents and prescriptions will describe best management practices, including, but not limited to, no refueling of machinery or herbicide mixing within 15 meters of a riparian zone, no clean up (excluding the case of an emergency spill) or disposal of herbicide materials within 15 meters of riparian zones, and a requirement to install descriptive flagging such as “Riparian Zone” and “Pesticide-Free Zone” placed appropriate intervals.
- Ensure that the minimum protection measures during herbicide applications for bodies of water (temporary, permanent, fish-bearing, not fish-bearing), dry streams, and classified wetlands are adhered to according to the requirements specified in the IPMR. These requirements are summarized in the following table:

Table 9: PFZ Requirements under the IPMR When Applying Herbicides for Invasive Plant Control

Permitted Application	PFZ	Regulation Section
<u>Non-glyphosate Applications</u> Around or along a body of water or dry stream and classified wetland using any pesticide except glyphosate, subject to label restrictions and including all application methods	10 meter PFZ	73(1)
<u>Glyphosate Applications</u> If the glyphosate product is applied by selective application methods up to but not below the high water mark of temporary, free-standing bodies of water that are not fish-bearing at any time of the year and do not drain directly into a fish-bearing body of water	1 meter PFZ above the high water mark	74(2)(a) and 77(2)
If the glyphosate product is applied by selective application methods over a dry stream that is not fish-bearing at any time of the year and do not drain directly into a fish-bearing body of water	0 meter PFZ	74(2)(b)

Definition: **Pesticide-free zone (PFZ)** – an area of land that must not be treated with pesticides, and must be protected from pesticides moving into it. PFZs are measured by the horizontal distance from the high water mark. PFZs will be identified, marked/flagged prior to any herbicide application.

5.4 Strategies to Prevent Herbicide Contamination of Food Intended for Human Consumption

Berry picking is common throughout the plan area. For example, the berries from Himalayan and cutleaf evergreen blackberry, common invasive plants, are frequently used as food. Bee keeping areas, vegetable gardens, and areas containing agricultural crops or domestic animals are also found at many locations within the plan area, but generally far removed from any potential treatment area(s). In addition, First Nations people within the Plan Area may use several species of plants for ethno-botanical purposes.

The plan holder shall ensure that, prior to herbicide applications for invasive plant management, strategies are developed and implemented to prevent herbicide contamination of food intended for human consumption including:

- During the required consultation process, First Nations will be invited to forward the names of those plant species of cultural importance, so that they are not inadvertently affected during treatment activities. Additional invasive plant species will be added to this list if identified by First Nations bands and other groups or individuals. Efforts will continue through formal and informal consultation to determine the locations of these activities. Measures will be made to assess the resource and accommodate wherever possible. Some measures could include delay of treatment or alteration of treatment boundaries;
- Non-chemical methods of invasive plant management shall be considered where treatment objectives can be achieved;
- If control methods involve the application of herbicides, increased NTZs may be maintained around areas where food for human consumption is growing, if required, during herbicide applications;
- Treatment notices shall be posted at public access points to proposed treatment areas advising of treatment near the food crops. This will ensure that people are aware that the area has been treated with herbicides; and,
- Where possible, herbicide treatments shall be conducted at times to minimize impacts on food plants (e.g., control of Himalayan or cutleaf evergreen blackberry after the fruit has predominantly dropped from the vine).

5.5 Pre-Treatment Inspection Procedures for Identifying Treatment Area Boundaries

The following procedures shall be implemented to ensure that treatment area boundaries are identified and clearly marked prior to herbicide applications:

- A pre-treatment inspection shall be conducted to establish treatment boundaries and to document the location of environmentally sensitive areas;
- Treatment area boundaries and the location of environmentally sensitive features shall be mapped, the maps will then be made available to the Contractor;
- A pre-treatment meeting shall be held between the Contractor and the plan older to confirm treatment area boundaries and the locations of environmentally sensitive features; and,
- Marking/flagging of all PFZs and/or NTZs shall be completed prior to herbicide application.

5.6 Procedures for Maintaining and Calibrating Herbicide Application Equipment

All herbicide application equipment used under this PMP for invasive plant management shall be safe, clean, in good repair, compatible and appropriate for the herbicide being applied. All backpack sprayers shall be inspected and calibrated prior to the commencement of herbicide applications each year, and weekly throughout the application season. An example of an Equipment Calibration and Checklist form is shown in Appendix 3. Contractors will also be required to complete an operational log that must be submitted on a weekly basis (along with treatment records) to the Contract Coordinator that included information on equipment maintenance and calibration. Calibration is not undertaken on wick/wipe on applicators, squirt bottles or injection tools.

Backpack sprayers shall also be re-calibrated when changing herbicide products or when nozzle output begins to vary.

5.7 Procedures for Monitoring Weather Conditions and Strategies for Modifying Herbicide Application Methods for Different Weather Conditions

Weather Monitoring

An anemometer (wind speed) and thermometer will be used at the treatment sites before herbicide treatment occurs to ensure weather conditions are suitable for herbicide application, and periodically during herbicide applications.

Wind speed and direction, precipitation, temperature and sky conditions (clear, overcast, cloudy, partly cloudy) will be recorded for foliar herbicide applications when using backpack sprayers. Temperature, precipitation, frost and dew conditions will be recorded for stem, bark, wick/wipe-on and stump applications. Persons applying herbicides are responsible for checking each product label for guidelines for applying herbicides under various weather conditions.

Stop Treatment Conditions

The certified pesticide applicator has the final authority on when herbicide applications should be stopped due to inclement weather or adverse site conditions. Backpack herbicide operations shall be stopped when parameters are exceeded according to the manufacturer's label.

Herbicide applications shall be stopped:

- When conditions prevent the herbicide product from being applied effectively according to label instructions (e.g., periods of rain or snow); OR
- When wind speed and/or direction causes the foliar backpack application of herbicide to drift and/or miss the target invasive plants; OR
- Ground wind velocity is over 8 km/hour for foliar backpack application; OR

- The maximum temperature stated on the herbicide label is exceeded; OR
- It begins to rain, increasing the chances of excessive runoff and leaching; OR
- There is ice or frost on the foliage.

6.0 Reporting, Notification and Consultation

6.1 Reporting

Accurate record keeping allows both plan holder and the Administrator, *IPMA*, to:

- Monitor the quantity of herbicides used;
- Ensure compliance with the IPMR;
- Ensure compliance with the commitments made in this PMP; and,
- Ensure compliance with the contents of the Pesticide Use Notice.

The plan holder will ensure that each of the required records described below are maintained.

6.1.1 Confirmation Holder Use Records

Both the plan holder and each contracting firm that applies herbicides for the plan holder must maintain daily records of herbicide use.

Section 37(1) of the IPMR describes the requirements for these records. The following records must be kept for each treatment location and day of use:

- The date and time of the herbicide use;
- The name of the invasive plant targeted by the use or the purpose of the herbicide use;
- The trade name of each herbicide used and its registration number under the federal Act;
- For each herbicide used, the method and rate of application and the total quantity used;
- The prevailing meteorological conditions including temperature, precipitation and velocity and direction of the wind, these conditions should be measured at the beginning of each day before starting treatment, re-measured if obvious changes in environmental conditions occur throughout the day, and re-measured at the end of any treatment day; and,
- A record for each piece of the holder's herbicide application equipment that requires calibration showing when the equipment was calibrated and the data upon which its calibration was based.

In addition to maintaining daily records of herbicide use, all users of the PMP will retain records of site assessment and invasive plant inventory as well as operational herbicide and other treatment records. These records will include:

- Site assessment and invasive plant inventory forms;
- Treatment notifications;
- Maps of invasive plant sites, treatment and biological control;

- Pre and post treatment records of sites; and
- Project checklists including equipment, First Aid and spill kit.

6.1.2 Annual Report for Confirmation Holders

In accordance with Section 39 of the IPMR, the plan holder will provide to the Regional Administrator, *IPMA*, the following information for each calendar year by January 31 in the next calendar year for operations conducted under this PMP during the calendar year:

- The name and address of the confirmation holder, and their confirmation number;
- Trade name and active ingredient of the herbicide(s) applied, including their PCP numbers;
- Locations and total area treated (ha); and,
- Quantity of each active ingredient applied (kg).

6.2 Notifications

The plan holder commit to providing the following notifications with respect to this PMP:

6.2.1 Notification of PMP Confirmation

The plan holder will, within 7 days of the plan confirmation date, make available, for the term of the confirmation, a copy of the confirmation and the PMP with relevant maps at their local office to allow inspection by the public.

6.2.2 Annual Notice of Intent to Treat

As per section 42 of the IPMR, for the purpose of an annual Notice of Intent to Treat, the plan holder will prepare and retain a detailed map showing the treatment locations for the applicable calendar year, which indicate the following for each treatment location:

- The proposed treatment areas; and
- The geographic or other sensitive features that require a PFZ or NTZ.

The plan holder will forward, in writing, to MoE, at least 21 days prior to treatment in each year during which the PMP is in effect, an Annual Notice of Intent to Treat (NIT) for the following year. The NIT will be submitted to each Regional Office of MoE within whose geographic boundaries herbicide applications are being proposed. This NIT will identify:

- Name and business location of confirmation holder(s);
- Proposed treatment areas;
- Proposed treatments;
- Herbicides proposed for use and their method of application; and,
- The total area proposed for treatment.

6.2.3 Requests to Amend the PMP

The plan holder will forward, in writing, to MoE, amendments requested for the PMP. Amendment requests to add new application techniques or similar changes will not require further public advertising or First Nations consultation, provided that the amendment request is within land owned or controlled by the plan holder. Amendments to add new active ingredients will require further public advertising and/or First Nations consultation.

6.2.4 Notification of Contravention

Section 72(1)(d) of the IPMR requires that a confirmation holder give written notice to the administrator on a contravention of the *IPMA* or IPMR that involves the release of a pesticide into the environment. The plan holder commits to abiding by this requirement.

In addition, the plan holder has implemented contractor guidelines to ensure compliance. Failure of the contractor to observe the following requirements may be cause for contractor dismissal:

- Violation of the requirements of the *IPMA* or the IPMR;
- Mixing of herbicides in inappropriate locations such as near environmentally sensitive zones;
- Failure to use adequate personal protective equipment when required by the product label;
- Application of treatment herbicides within prohibited zones;
- Improper cleanup or reporting of spills;
- Application of herbicides by uncertified personnel without appropriate supervision;
- Improper disposal of unused herbicides or containers;
- Improper equipment calibration;
- Application of herbicides under inappropriate or unsafe conditions;
- Failure to properly complete and submit daily operating logs or records; or,
- Handling, storing, mixing, transporting, or applying herbicides in a manner that violates product labels.

6.2.5 Public Notification Prior to Treatment

Notification of individuals, communities and organizations in the time and manner as agreed during the public consultation process, will be completed prior to treatments. The plan holder will maintain a record of all public notifications for each treatment area.

6.2.6 First Nations Notification Prior to Treatment

Notification of First Nations in the time and manner as agreed during the First Nations consultation process will be completed prior to treatments. The plan holder will maintain a record of all First Nations notifications for each treatment area.

6.2.7 Employee Notification Prior to Treatment

The plan holder will provide internal notification to all potentially affected employees in advance of all herbicide treatments via electronic mail, bulletins or written postings (i.e., Treatment Notices). Examples may include notifying Park Facility Operators and Area Supervisors responsible for parks within the targeted area or maintenance personnel with the BC Ministry of Transportation and Infrastructure.

Employee notification is not normally conducted in advance of mechanical methods of invasive plant control such as cutting or manual removal.

6.2.8 Posting of Treatment Notices

Prior to treatment, Treatment Notices will be posted in locations so that they are clearly visible and legible from each approach maintained by the plan holder for public/employees/contractors to access the treatment area or at locations where due diligence would seem to require them. The signs shall remain posted for 24 hours following herbicide application, and contain the following information:

- The trade name and active ingredient of the herbicide that will be used;
- The date and time of the herbicide used;
- The purpose of the treatment;
- The method of application;
- Precautions to be taken to prevent harm to people entering the treatment area;
- The PMP confirmation number;
- The plan holder(s) contact information; and,
- For each treatment location, the applicator will maintain a record of where notices were posted.

The Treatment Notices shall be:

- A minimum size of 550 sq. cm;
- Water resistant;
- Display the title “**Notice of Pesticide Use**” in bold letters that are clearly legible to a person approaching the treatment area. Substitution of “pesticide” with “herbicide” or another appropriate category of pesticide is permissible.

An example of a Treatment Notice is shown in Appendix 4:

6.3 Consultations

6.3.1 Public Consultation Plan

Prior to submitting a Pesticide Use Notice to MoE for PMP confirmation, the plan holder will carry out a consultation process with the public.

The objectives of conducting consultations when this PMP is at the draft stage are:

- To increase public awareness of the PMP process and of the principles of Integrated Pest Management which are embodied in the PMP;
- To ensure that the public have an opportunity to identify concerns, and for the plan holder(s) to address those concerns before the PMP is finalized and a Pesticide Use Notice submitted for confirmation;
- To ensure a transparent and accountable review process for the PMP;
- To educate the public on the need to manage invasive plants; and,
- To explain how the planning process that is described in the PMP recognizes the need to protect human health and the environment.

The public will be consulted of the PMP development via notices in local community newspapers within the geographic boundaries of the plan.

As per Section 61(1) of the IPMR, at least 45 days before submitting a Pesticide Use Notice, the first of 2 notices, at least 40 cm² in size, will be published within a 2 week period in newspapers circulated in the various communities (or nearest communities).

During the public consultation process, the draft PMP will be accessible to the public in various locations, as stated in the public notifications, and on the MFR's IAPP website to allow the public to view and download the PMP text and the maps.

<http://www.for.gov.bc.ca/hra/plants/index.htm>

6.3.2 Public Consultation Report

The plan holder will submit to the Administrator, *IPMA*, a Public Consultation Report that contains:

- A summary of public consultations, including the names and addresses of those who provided input, the nature of their concerns and/or recommendations, and the plan holder(s) response to the input from the public.
- A list of newspapers in which notification of the pending PMP submission appeared, along with the publication dates and a photocopy or tear sheet of a representative advertisement.

6.3.3 First Nations Consultation Plan

In addition to the objectives for public consultation outlined in Section 7.3.1, the plan holder will consult with First Nations to avoid infringement on aboriginal rights, treaty rights, or cultural values during their PMP. The plan holder not only has an obligation to consult with First Nations, it must also attempt to address their concerns and accommodate their cultural interests. Consultation processes must take into account the BC Treaty negotiation process and the current litigation actions by First Nations respecting aboriginal land use or sovereignty. Both of these major issues can have an impact on the plan holder invasive plant management program. In light

PMP for Invasive Alien Plant and/or Noxious Weed Control on Provincial Crown Lands for South Coastal BC

of the above sensitivities and special concerns, the plan holder is committed to establishing and maintaining positive relationships with First Nations through meaningful and respectful consultation.

In conducting these First Nations consultations, the plan holder will follow all of the procedures outlined in the May, 2006 publication entitled “*Draft Guidelines for IPM Proponents Conducting Consultations with First Nations*”, published by the BC Ministry of Environment, Integrated Pest Management Program.

The First Nations within the geographic area covered by the PMP include:

Ahousaht First Nation	Namgis First Nation
Beecher Bay First Nation	Nanaimo (Snuneymuxw) First Nation
Campbell River First Nation	Nanoose (Snaw-naw-as) First Nation
Cape Mudge First Nation	Nuchatlaht First Nation
<i>Central Region Board *</i>	<i>Nuu-chah-nulth Tribal Council *</i>
Chemainus First Nation	Nuxalk Nation
Comox (K’omoks) First Nation	Pacheedaht First Nation
Cowichan Tribes	Pauquachin First Nation
Danaxda’xw-Awaetlala First Nation	Penelakut First Nation
Ditidaht First Nation	Qualicum First Nation
Ehattesaht Tribe	Quatsino First Nation
Esquimalt First Nation	Sechelt (Sheshalth) First Nation
Gwa’sala-‘Nakwaxda’xw First Nation	Sliammon First Nation
Gwawaenuk Tribe	Songhees First Nation
Halalt First Nation	<i>Te’Mexw Treaty Association *</i>
Hamatla First Nation	Tla-o-qui-aht First Nation
Hesquiaht First Nation	Tlatlasikwala First Nation
Homalco First Nation	Tlowitsis Tribe
<i>Hul’qumi’num Treaty Group *</i>	Toquaht First Nation
Hupacasath First Nation	Tsartlip First Nation
Huu-ay-aht First Nation	Tsawataineuk First Nation
Ka:’yu:k’t’h/Che:k:tles7et’h’ First Nation	Tsawout First Nation
Klahoose First Nation	Tsawwassen First Nation
Kwakiutl First Nation	Tseshah First Nation
Kwiakah First Nation	Tseycum First Nation
Kwicksutaineuk-Ah’Kwah’Ah’Mish First Nation	T’Sou-ke First Nation
Lake Cowichan First Nation	Uchucklesaht First Nation
Lil’wat (Mount Currie) First Nation	Ucluelet First Nation
Lyackson First Nation	Ulkatcho First Nation
Malahat Band	Wuikinuxv First Nation
Mamalilikulla Qwe’Qwa’Sot’Em First Nation	XeniGwetin First Nation
Mowachaht/Muchalaht First Nation	

* = umbrella organization

6.3.4 First Nations Consultation Report

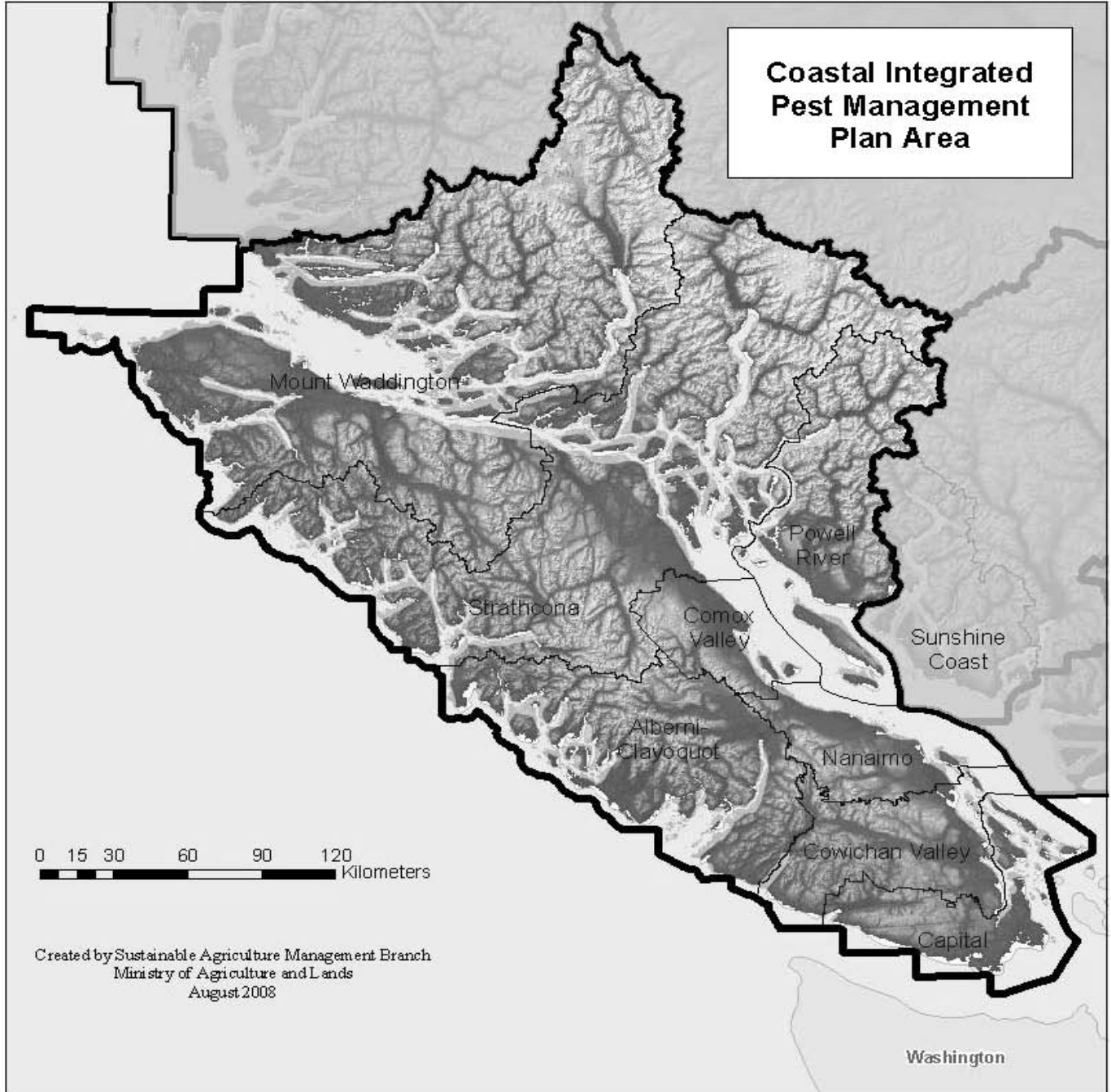
In order to facilitate Ministry consideration of the adequacy of First Nations consultations and of the plan holder response to any issues raised, the plan holder will prepare a report that describes the consultation process and outcomes. This report will be submitted to the Administrator, *IPMA*, in conjunction with the submission of the Pesticide Use Notice application. A copy of this report will also be provided to the First Nations with whom consultation was conducted and to the Ministry prior to initiation of a pesticide use. When the report is sent to a First Nation, a letter will be included that indicates to the First Nation that they may submit comments or concerns regarding the report to the Ministry.

6.3.5 Interagency Consultation and Coordination

MFR has been a leader in invasive plant control in the province of British Columbia and actively involved with coordinating invasive plant management programs with other Ministries, agencies and stakeholders. Information on invasive plant inventories, treatment and biological weed control will be provided to these groups on an ongoing basis. Since the *BC Weed Control Act* states that ‘every occupier has the responsibility to control noxious weeds’, MFR will conduct its integrated invasive plant program within the plan area in communication and cooperation with other ‘land occupiers’ including, but not limited to:

- BC Ministry of Agriculture and Lands, including the Integrated Land Management Bureau
- BC Ministry of Transportation and Infrastructure
- BC Ministry of Environment, including Protected Areas Division
- Utilities, including BC Hydro, British Columbia Transmission Corporation, and Terasen Gas
- First Nations
- Local governments including Regional Districts and Municipalities
- Coastal Invasive Plant Committee
- The Nature Trust of BC
- Range Act agreement holders

Appendix 1: Map of PMP Area



Appendix 3: Equipment Calibration and Checklist

CALIBRATION RECORD

	Date _____
	Calibration # _____
	Company _____
	Calibration Location _____

Instructions for backpack sprayer (for 400L / ha application)

Measure a 25m by 25m square in a field or landing at least 20 m away from any riparian area or watercourse. Using water in equipment, measure the time taken with each piece of equipment and nozzle combination to fill a measuring cup to 1.0 L. This time indicates the time taken for a piece of equipment to release 400 L of carrier to 1 hectare of area. Have every applicator evenly cover the 25m test square in the time allotted for each piece of spray equipment. Record equipment and applicator times below with each applicator understanding the swath speed for correct coverage with each piece of equipment. Each applicator will undergo three calibrations with each piece of equipment.

Equipment and Applicator Summary

Applicator	Spray equipment	Correct Time (sec)	Calibration attempts (sec)
			1
			2
			3
			1
			2
			3
			1
			2
			3
			1
			2
			3
			1
			2
			3

Appendix 4: Example of Treatment Notice



NOTICE OF PESTICIDE USE

Treatment Area:

Pest(s) To Be Controlled:

Pesticide Name(s), Active
Ingredient(s) & Registration
Number(s) (PCP):

Start Time & Date Of Pesticide
Application:

Alternate Start Time & Date:

Pesticide User Licensee Name
& Licence Number:
Telephone Number:

Precautions to Minimize
Exposure to Pesticides:

Do not enter the treated area before

Do not remove this sign before

For emergency medical information contact:
B.C. Drug and Poison Information Centre 1-800-567-8911 or 604-682-5050