

**B.C. Integrated Pest Management Regulations for
Forestry, Noxious Weed and Industrial
Vegetation Managers**

Summary of Requirements and Explanatory Notes

**PHASE 1:
Pest Management Plan
Development**



Ministry of
Environment

Ministry of Environment
Environmental Management Branch
Integrated Pest Management Program

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NOTE:

The *Explanatory Notes for Forestry, Noxious Weed and Industrial Vegetation Managers* will be released in two parts. This publication, Phase One, addresses questions relating to the development of Pest Management Plans (PMPs). This document contains an Introduction (1.0), the Summary of Requirements (2.0), and the Explanatory Notes relating to the content of PMPs (3.0 & 3.1) and the public consultation requirements (3.2). The Appendices for the complete document is also included in this release.

Phase Two will contain the Explanatory Notes which primarily relate to operational requirements. These include information about the Notice of Intent to Treat (3.3), requirements to use Integrated Pest Management (IPM) (3.4), public notification requirements (3.5), standards for pesticide use (3.6), and the maintenance of records and annual summary submissions (3.7). Once the final drafts are complete, the two documents will be combined to form a single Explanatory Notes publication.

Readers will notice that some references in this document refer to Explanatory Notes that are NOT included in Phase One. These Explanatory Notes will be available in Phase Two.

If readers note any errors or inconsistencies or have recommendations for topics to be included in future versions of this document, please send your comments to IPM.ENotes@gov.bc.ca.

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1. INTRODUCTION

This document has been prepared by the Ministry of Environment to assist pest managers in determining the requirements under the *Integrated Pest Management Act (IPMA)* and Regulation (IPMR) for pesticide (herbicide) use for forestry and industrial vegetation management and the management of noxious weeds and invasive plants.

The main objectives of the legislation are: to promote the use of Integrated Pest Management and prevent unreasonable adverse effects to human health and the environment from the use of pesticides.

This document includes a summary of all the *IPMA* and IPMR requirements for forestry and industrial vegetation management and the management of noxious and invasive plants, followed by “Explanatory Notes” for selected requirements. These selected requirements were identified by industry contacts or Ministry staff as requiring guidance to help proponents understand or achieve the requirements. Many of the Explanatory Notes deal with requirements introduced with the enactment of the *Integrated Pest Management Act* in January, 2005, replacing the former *Pesticide Control Act*.

The main topics selected for Explanatory Notes include:

- preparation of Pest Management Plans (PMPs);
- public consultation;
- annual Notices of Intent to Treat (NIT);
- use of Integrated Pest Management;
- notification and posting of treatment notice signs;
- pesticide storage;
- prevention of water contamination;
- protection of fish and wildlife, riparian areas and wildlife habitat;
- preparations for pesticide use (equipment maintenance and calibration, site inspections, and briefing applicators);
- prevention of human exposure; and
- record keeping and annual reporting.

The main objectives of this document are to:

- provide a summary of requirements for forestry and industrial vegetation management and the management of noxious and invasive plants for quick reference;
- promote the same understanding of the requirements across industry stakeholders, interested public and Ministry of Environment staff;
- provide background information and examples that may assist pest managers in determining the most appropriate way to meet requirements; and
- promote compliance with the requirements.

This is not a legal document and the contents should not be relied upon for legal purposes. In all cases the *IPMA* and IPMR will prevail. This document includes information on other key regulations, guidelines and best management practices applicable to pesticide use in B.C., but should not be relied upon as a complete source of all such information.

Introduction

Proponents may wish to review our *IPMA* and IPMR Summary posted on our website (http://www.env.gov.bc.ca/epd/ipmp/regs/pdf/leg_summary.pdf). This summary is intended to provide an overview of the legislation. Section 2.3 of this document provides a brief summary of the process of developing a PMP and receiving a Confirmation.

Please Note: Confirmation holders may use contractors with Pesticide User Licences to apply herbicide. Confirmation holders should take all reasonable care to ensure the licensees are informed of the IPMR's requirements as they pertain to the herbicide applications conducted under the PMP. According to S.72(1)(d) [IPMR], if a confirmation holder believes that they or another person has contravened the *IPMA* or IPMR, they must provide written notice to the Ministry as soon as possible.

Verification Activities Conducted by the Ministry

The Ministry conducts inspections to monitor compliance in relation to most of the Acts and Regulations for which it is responsible, including pesticide management. The pesticide uses to be inspected may be selected at random or may be selected based on criteria such as the following:

- the treatment areas contain or are close to sensitive features (e.g., salmon spawning rivers, wetlands used by migratory birds, residential properties);
- the treatment areas are relatively large;
- the pesticides to be used have residual activity or have a risk of off-site movement through leaching or run-off; or
- the application methods have significant drift potential (e.g., aerial application, non-shrouded boom sprayer).

Inspections of pesticide uses may include:

- looking for indications of potential impacts on or risk to human health and the environment;
- checking that regulatory requirements have been met;
- following-up a question or concern raised by the public or a concerned agency;
- assessing effectiveness and practicality of the regulations; and
- assisting Health Canada or Environment Canada with monitoring programs for continued registration of a pesticide product.

This document will be used to standardize inspectors' interpretation of the IPMR so they may communicate expectations to proponents. It should serve to facilitate discussions when promoting understanding of requirements under the IPMR.

Understanding Terms Used in this Document:

Pest is a broad term that can relate to animals, insects, fungi and plants. The *IPMA* defines "pest" as "an injurious, noxious or troublesome living organism, but does not include a virus, bacteria, fungus or internal parasite that exists on or in humans or animals". For the purpose of this document, the term "pest" may be used interchangeably with "weed", "plant" or "vegetation". In addition, "pesticide" is considered synonymous with "herbicide".

A "**noxious weed**" is a plant specified under the *Weed Control Act*. An "**invasive plant**" is a plant specified under the *Forest and Range Practices Act*.

2. SUMMARY OF REQUIREMENTS

Notes:

1. The requirements listed below that have an Explanatory Note (EN) later in this document, are identified with an icon  and the section number of the Explanatory Note.
2. The section of the IPMR from which the requirements below are taken is shown in the format: [S.00]. If the requirement is from the Act it is shown in the format: [IPMA S.00].
3. Throughout the following text the term **Pest Management Plan Holder** means a person who has registered a Pest Management Plan and received a Confirmation from the Ministry of Environment. The IPMR refers to such a person as a “confirmation holder”.

2.1 Requirements for Registering a Pest Management Plan, or Obtaining a Pesticide User Licence or Permit

Companies, government ministries and agencies, municipalities, regional districts or individuals using pesticides to manage vegetation must register a Pest Management Plan (PMP), obtain a Pesticide User License or obtain a Permit as described below.

Pest Management Plan: A person must prepare and register a PMP with the Ministry of Environment if they propose any of the following on land managed by a single entity:

- manage vegetation on more than 20 ha a year of public land that is used for timber production or forested [S.24(2)(e)];
- manage vegetation on more than 20 ha a year of land that is:
 - ♦ public or private land used for a railway right-of-way, yard or associated signal or communication facility [S.24(2)(a)],
 - ♦ public or private land that are used for: (a) a highway; (b) a facility or right-of-way for a public utility as defined in the *Utilities Commission Act*; (c) a facility or right-of-way for the delivery of water, not including a pipe or system or arrangement of pipes to distribute water in a community or to ultimate consumers; or (d) a pipeline as defined in the *Petroleum and Natural Gas Act* and associated facilities [S.24(2)(b)], or
 - ♦ public land used for an industrial site other than listed under (a) and (b) above [S.24(2)(f)]; and
- manage noxious weeds or invasive plants on more than 50 ha a year of public land¹ [S.24(2)(g)].

¹ A Pest Management Plan is required for management of more than 20 ha/year of noxious weeds or invasive plants if it is done together with management of other plants on land used for forestry, railways or other industrial sites.

Summary of Requirements

Pesticide User Licence: A person must obtain a Pesticide User License if they:

- provide or offer to provide a service involving the use of a pesticide under a contract for services [IPM Act S.4];
- manage vegetation on not more than 20 ha a year of public land that is used for timber production or forested [S.5(2)(j)];
- manage vegetation on any amount/year of private land used for timber production [S.5(2)(g)];
- manage vegetation on not more than 20 ha a year of public or private land used for a railway right-of-way, yard or associated signal or communication facility [S.5(2)(a)];
- manage vegetation on not more than 20 ha a year of public or private land used for: (a) a highway; (b) a facility or right-of-way for a public utility as defined in the *Utilities Commission Act*; (c) a facility or right-of-way for the delivery of water, not including a pipe or system or arrangement of pipes to distribute water in a community or to ultimate consumers; or (d) a pipeline as defined in the *Petroleum and Natural Gas Act* and associated facilities [S.5(2)(b)];
- manage vegetation on not more than 20 ha a year of public land used for an industrial site other than listed above [S.5(2)(k)]; and
- manage noxious weeds or invasive plants on not more than 50 ha a year of public land [S.5(2)(l)].

A Pesticide User Licence is not required by a person who:

- uses, sells or provides a service using a pesticide listed as an Excluded Pesticide in Schedule 2 of the IPMR [S.6(1)(a)];
- uses a pesticide only as an employee or contractor of a licensee [S.6(1)(b)];
- is a paving company which under contract for paving services manages vegetation before paving [S.6(1)(c)];
- as an owner of land treats goods brought to his own property [S.6(1)(d)];
- having a possessory interest in agricultural land in relation to which another person has a surface lease, or another right of entry, for purposes of a pipeline or an oil or gas facility, applies pesticide to control vegetation on the pipeline right-of-way or on or around the oil or gas facility under contract with the holder of the surface lease or other right of entry² [S.6(1)(e)]; or
- uses a pesticide for a research purpose if the pesticide is exempt from registration under the federal *Pest Control Products Act* for the research purpose and the research is consistent with requirements of the federal Act [S.6(1)(i)].

Pesticide Use Permit: A person must obtain a Pesticide Use Permit (PUP):

- for use of a permit-restricted pesticide [S.18(1)] listed in Schedule 1³;
- for the aerial use of a pesticide, except if the pesticide is listed in Schedule 4 and applied in accordance with a licence or confirmation, to land that is neither in an urban area, nor used for residential purposes⁴ [S.18]; or

² An example of a person not requiring a licence is a grower who is contracted by an oil well company to manage noxious weeds on land leased for their wells, within the property owned by the grower.

³ As of the publication date of this document, no herbicides used for vegetation management are listed as permit-restricted.

Summary of Requirements

- if a licence or PMP holder requires an exemption from a pesticide use standard for storage, transportation, disposal or use under Section 33(3)(b) [S.18(3)]. A proponent may apply for a deviation from the IPMR through the PUP process.

2.2 Requirements for Certified Staff

Licence holders must hold, or employ at least one person who holds, a Pesticide Applicator Certificate endorsed for the appropriate category of pesticide use. Pest Management Plan holders must either hold or employ a person with a Pesticide Applicator Certificate or contract a License holder for the work relevant to the PMP. In order to obtain a certificate, an applicant must be 16 years of age and pass an examination set by the administrator pertaining to the matters covered by the IPMR and *IPMA* [S.16(1)].

The licence or PMP holder must ensure that each use of a restricted pesticide is performed by a certificate holder [S.14(1)] and that each use of other pesticides is performed by, or supervised by, a certificate holder [S.46(1), 49(1), 72(1)(b)]. A certificate holder must not supervise more than four uncertified individuals and must be no more than 500 m from, and in continuous visual or auditory contact with each person being supervised [S.46(2), 49(2), 72(2)]. The licence or Pest Management Plan holder must also ensure that the certificate of each individual using or supervising the use of a pesticide is at or near the treatment location during the pesticide use [S.49(1)(c), 72(1)(c)].

Please note that according to IPMR S.14(2), any pilot of an aircraft applying pesticides must be certified.

2.3 Process for Preparing and Registering a Pest Management Plan

A PMP is a document developed by a proponent that describes proposed vegetation management activities for a five year period. This plan outlines the 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. It also describes the precautions that will be taken to protect human health and the environment. The document is to be available for public and Ministry of Environment review [S.7(6)(b) of the *IPMA*]. The IPMR specifies the information that must be contained in a PMP, public consultation and notification requirements and requirements for registering the plan with the Ministry of Environment. The process for preparing, registering and operating under a PMP includes the following actions:

- preparation by the applicant of a PMP, following requirements of the IPMR as per S.58 of the IPMR;
- conducting public consultation and advertising in newspapers (as specified in IPMR S.61) and consideration of comments;
- finalization of the PMP;
- preparation and maintenance of public consultation record as per IPMR S.38;

⁴ Glyphosate is the only herbicide listed in Schedule 4 and therefore is the only herbicide that can be applied aurally without a permit.

Summary of Requirements

- submission to the Ministry of Environment of a Pesticide Use Notice (PUN) with information required by Section 59 of the IPMR (Note: the PUN form specified by the Administrator requests that proponents indicate that consultation was conducted in accordance with terms of the Regulation and the Plan has been finalized);
- obtaining a Confirmation of receipt of the Pesticide Use Notice from the Ministry [*IPMA* S.7];
- submission of an Annual Notice of Intent to Treat to the Ministry at least 21 days prior to pesticide use in each year of the confirmation [S.42];
- notification of individuals as agreed during consultation [S.28(2) IPMR]
- posting of notices (signs) to alert people who may enter recently treated areas [S. 64 IPMR];
- safe use and handling of pesticides and use of Integrated Pest Management in accordance with requirements set out in the IPMR [S.31, 32, 33, 65-67, 69-77]; and
- keeping records of pesticide use and submission of annual reports (including specified information and maps) to the Ministry [S. 37-39].

The Ministry of Environment must confirm receipt of a Pesticide Use Notice (PUN) or amendment if satisfied that [S.7(2) and (3) *IPMA*]:

- a PUN has been provided to the Administrator in the form specified by the Administrator;
- the PUN contains the information prescribed by the administrator's regulations;
- it contains the person's declaration that the PMP complies with the administrator's regulations and that the person will ensure compliance with the *IPMA* and the regulations in the use of pesticide;
- the applicant is not subject to a previous restriction (suspension or revocation of a licence, certificate or permit) imposed by the Ministry of Environment; and
- the prescribed fee is submitted.

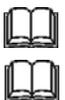
Proponents must use the prescribed form and provide all of the required information for the Administrator to issue a confirmation of receipt. The Administrator is not required to issue a confirmation if:

- the information requested on the specified form has not been provided; or
- the Administrator becomes aware that a proponent has not met the prescribed criteria (i.e., incomplete PMP, incomplete consultation, etc.).

An applicant must maintain a business location in British Columbia for doing business in the province or provide the Ministry of Environment with an address in British Columbia at which the applicant may be served with documents [S.26 IPMR].

2.4 Pest Management Plan Content Requirements [S. 58 IPMR]

A Pest Management Plan must include the following identifying information [S.58(1) IPMR]:

- 
- a description of the geographic boundaries of the area to which the plan applies and maps or diagrams showing proposed treatment areas within that area (**EN 3.1.1**);
 - the person responsible for managing pests in relation to the land described (**EN 3.1.2**); and
 - the name and phone number of an individual who is the principal contact for information pertaining to the Pest Management Plan.

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A Pest Management Plan must include the following six integrated pest management elements: **(EN 3.1.3 to 3.1.8)** [S.58(2) IPMR]:

- a description of the program that will be employed to prevent organisms from becoming pests;
- either a description of the program that will be employed to identify pests, or identification of the pests, targeted by the plan;
- a description of the monitoring program that will be employed before or during periods of pesticide use for assessing pest populations, environmental conditions and damage caused by pests, including the monitoring methods, frequency of monitoring and data that will be collected;
- the injury thresholds that will be applied in deciding whether a pesticide treatment is necessary and an explanation of how the thresholds were chosen and how they will be applied;
- pest treatment options, including a description of the pesticide and non-pesticide treatment methods of controlling pests that may be used, the rationale for selecting treatment methods, the benefits and limitations of each treatment method, and a description of how a decision to use treatment methods will be made; and
- a description of the monitoring program that will be employed for evaluating effectiveness of the pesticide use on pest populations and the environment, including effects on organisms other than targeted pests, for comparison with the information collected through monitoring before and during periods of pesticide use.

A Pest Management Plan must include the following operational information [S.58(3) IPMR]:



- a description of the methods of handling, preparing, mixing, applying and otherwise using pesticides that will be employed under the PMP, including procedures for the following **(ENs 3.1.9 to 3.1.13)**:
 - ♦ safely transporting pesticides,
 - ♦ safely storing pesticides,
 - ♦ safely mixing, loading and applying pesticides,
 - ♦ the safe disposal of empty pesticide containers and unused pesticides, and
 - ♦ responding to pesticide spills; and
- a description of the environmental protection strategies and procedures that will be followed under the PMP, including:



- ♦ strategies to protect community watersheds and other domestic and agricultural waters sources from adverse effects of pesticide use **(EN 3.1.14)**,
- ♦ strategies to protect fish and wildlife, riparian areas and wildlife habitat from adverse effects of pesticide use **(EN 3.1.15)**,
- ♦ strategies to prevent the contamination of food intended for human consumption **(EN 3.1.16)**,
- ♦ pre-treatment inspection procedures for identifying treatment area boundaries **(EN 3.1.17)**,
- ♦ procedures for maintaining and calibrating pesticide application equipment **(EN 3.1.18)**,
- ♦ procedures for monitoring weather conditions and strategies for modifying pesticide application methods for different weather conditions **(EN 3.1.19)**, and



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- ♦ identification of each pesticide that will be used under the PMP, the manner of its application and the type of equipment required for each manner of application (EN 3.1.20) [S.58(3)].

2.5 Public Consultation Requirements for Preparing a Pest Management Plan [S. 61 IPMR]



A person preparing a Pest Management Plan must conduct public consultation by informing the public about the draft Pest Management Plan and soliciting comments and responding to concerns. Notices must be placed in newspapers serving communities nearest the treatment areas (EN 3.2.1) and there must be “reasonable” efforts to contact and consult with individuals who have the potential to be significantly impacted by a proposed pesticide use under the PMP (EN 3.2.2).

The newspaper notices must be published two times in a two-week period starting at least 45 days before submitting a Pesticide Use Notice to the Administrator. The notices must be at least 40 cm² in size and contain the following information:

- the heading “DEVELOPMENT OF A PEST MANAGEMENT PLAN” in block letters;
- a reference number or other identifier unique to the proposed PMP and the applicant’s name, address and telephone number;
- the area to which the PMP applies, a statement that pesticides are intended to be used and a description (including reference to communities) of the area;
- the proposed duration of the PMP;
- the trade name(s) and active ingredient(s) of the pesticide(s) proposed for use and the proposed manners of applying the identified pesticides;
- a location where copies of the proposed PMP and maps of the proposed treatment area may be examined; and
- the text: “A person wishing to contribute information about a proposed treatment site, relevant to the development of the Pest Management Plan, may send copies of the information to the applicant at the address above within 30 days of the publication of this notice.”

2.6 Pesticide Use Notice to Register a Pest Management Plan [S. 59 IPMR]

A person who has finalized a PMP following public consultation can then register the plan with the Ministry of Environment. This is done by submitting a Pesticide Use Notice to the Ministry with the following information:

- the name and business address of the applicant, and the name and address under which the applicant carries on business;
- the type and use of pesticide to which the notice pertains;
- a description of the geographic boundaries of the area to which the pesticide use notice relates (as described in the applicable PMP), including the names of the regional districts within those boundaries;
- a list of the active ingredients of the pesticides proposed for use under the applicable PMP;
- a statement of whether aerial application of pesticide is intended under the applicable PMP;

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- the name and phone number of an officer or employee of the applicant who is the principal contact for information relating to the applicable PMP, and the location where a copy of the PMP may be viewed during normal business hours; and
- the term of the applicable PMP (which must not exceed five years) and the appropriate fee prescribed in relation to the confirmation requested.

A form on which this information is to be submitted to the Ministry is available on the Ministry's IPM Program web site. The Ministry will issue a Confirmation of Receipt of the Pesticide Use Notice if the notice contains the required information and the applicant meets the specified requirements.



If any information on the Pesticide Use Notice changes, an amended notice must be submitted to the Ministry (EN 3.2.3). The Pest Management Plan holder must conduct additional public consultation if any of the following information must be amended:

- the class of pesticide,
- the description of the geographic boundaries of the area to which the pesticide use notice relates, and
- the active ingredients of the pesticides proposed for use in the plan [S.59(2)].

If an amendment to a Pesticide Use Notice is submitted, the Pest Management Plan must be changed to be consistent with the amended Pesticide Use Notice [S.58(4)].

2.7 Annual Notice of Intent to Treat [S. 42 IPMR]



At least 21 days⁵ before the first use of pesticide in each calendar year, a PMP holder must submit an Annual Notice of Intent to Treat (NIT) to the Ministry of Environment. The notice must contain the following information (EN 3.3.1):

- the name and business location of the confirmation holder;
- a description of the proposed treatment locations for the calendar year and a map or diagram that clearly identifies those locations;⁶
- a description of the proposed treatment for each area, including the pesticide to be used and its method of application; and
- the total area of treatment areas in the proposed treatment locations for the calendar year.



The information in the Annual NIT must be based on a detailed map or diagram prepared and retained by the PMP holder showing proposed treatment areas and the geographic features that require a pesticide-free zone or no-treatment zone [IPMR S.42(1)] (EN 3.3.1). These detailed maps or diagrams are to be provided to the Ministry of Environment within three business days,

⁵ The annual notice of intent to treat may be submitted together with the Pesticide Use Notice to start the 21-day period, but treatment may not commence after 21 days unless a Pesticide Use Notice Confirmation has been received.

⁶ The intent of the "locations" on this map or diagram is to show where pesticide is to be used, but not at the level of the detailed map or diagram retained by the confirmation holder showing the geographic features that require a pesticide-free zone or a no-treatment zone.

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if requested [IPMR S.42(6)]. A PMP holder must ensure that a person applying a pesticide on the PMP holder's behalf has access to the detailed maps or diagrams [IPMR S.72(4)].

Pesticides can only be used in areas described in the NIT. After a NIT has been submitted, a PMP holder may increase the total area of treatment by up to 10% of the total area listed in the original NIT if written notice is given to the Ministry of Environment at least two business days before using the pesticide in the area involved [IPMR S.42(4)]. If, during a calendar year, a PMP holder intends to exceed the total area of treatment by more than 10%, he or she must provide the Ministry with a revised NIT at least 21 days before the pesticide use that causes the excess [IPMR S.42(5)]. **If a proponent wishes to treat in a new treatment location, even if the addition is less than the total area noted in the original NIT, they must submit an amended NIT at least 21 days prior to the pesticide use at that location.**

2.8 Process for Operating Under a Pesticide Use Licence [S. 40 IPMR]

The process for operating under a Pesticide Use Licence includes the following actions:

- submit a licence application to the Ministry of Environment to obtain a licence;
- private forest land owners managing vegetation on more than 20 ha /year must conduct consultation with neighbouring property owners if within 150 m of treatment areas and must submit an Annual NIT to the Ministry;
- treatment notices are to be posted to alert people who may enter recently treated areas;
- pesticides are to be used only within an Integrated Pest Management approach and in accordance with standards set out in the IPMR; and
- records of pesticide use are to be maintained and annual reports submitted to the Ministry.

If a licensee has not given notice in their application for a Pesticide Use Licence that they intend to use a pesticide on public land or to aerially apply a pesticide, he or she must give written notice to the Ministry of Environment at least two business days before the first such use during the term of the licence [S.40].

2.9 Private Forest Land Owner Consultation with Neighbours [S. 62 IPMA]



Private forest land owners managing vegetation on more than 20 ha /year must consult with neighbouring property owners if within 150 m of treatment areas (**EN 3.2.2**). The consultation involves giving a notice to the neighbour at least 14 days before the pesticide use [S.62(1)]. The notice must contain the following information:

- a description of the treatment area and reason for the pesticide use;
- the pesticide to be used, its registration number under the federal Act and its active ingredients;
- the earliest date that the pesticide will be used;
- the width of any no-treatment zones that will be maintained from any water supply intake or well used for domestic or agricultural purposes (including water used for livestock or for irrigation of crops);

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- a request that the recipient supply the licensee with the location of any water supply intakes or wells and advise the licensee of other land uses that may be adversely affected by the use; and
- a phone number at which the licensee or an employee can be reached for more information about the proposed pesticide use [S.62(2)].

2.10 Private Forest Land Owner Annual Notice of Intent to Treat [S. 41 IPMR]



Private forest land owners managing vegetation on more than 20 ha /year must submit an Annual Notice of Intent to Treat to the Ministry of Environment at least 14 days before the first use of pesticide in each calendar year [S.41(2)] (**EN 3.3.1**). The notice must contain the same information required for the PMP holder NIT (listed above) [S.41(3)].

Private forest land owners managing vegetation on more than 20 ha /year must also prepare and keep detailed maps of proposed treatment locations, as required for PMP holders (described above) [S.41(1)]. Pesticides can only be used in the treatment areas specified in the NIT, except after the notice has been submitted, a licensee may increase the total area of treatment as described above for PMP holders [S.41(4&5)].

2.11 Public Notification Requirements



If a PMP holder offers to directly notify an individual about a treatment time or location during public consultation in the development of the Plan, the holder must fulfill the offer in the agreed time and manner before pesticide use (**EN 3.5.1**) [S.28(2)].



Both licence holders and PMP holders must post notices at entrances to treatment areas. Such notices are not to be removed for at least 14 days after the use (**EN 3.5.1**) [S.64(1)].

Posted notices for treatments on public land must be:

- clearly visible and legible from each approach used by the public to access a treatment area on public land; or
- at a location on a highway, so that they are clearly visible and legible to a member of the public accessing such approaches from the highway[S.64(2)(b)].

Posted notices for treatments on private land must be:

- clearly visible and legible from each approach maintained by the owner or manager of the land for use by the public to access the treatment area; or
- at a location on a highway so that the notice is clearly visible and legible to a member of the public accessing the approaches described in subparagraph (i) from the highway [S.64(2)(a)].

A posted notice must include:

- the trade name or active ingredient of the pesticide that will be used;
- the date and time of the use;
- precautions required to prevent harm to people entering the treatment area;

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- the confirmation holder's confirmation number; and
- contact information for the confirmation holder (or their agent) so that interested individuals can obtain additional information about the pesticide or pesticide use [S.64(2)(c&d)].

2.12 General Requirements for Protection of People and the Environment

Under the *IPMA* there are two general requirements that underpin the legislation [*IPMA* S.3]:

- A. A person must not use, handle, release, transport, store, dispose of, or sell a pesticide in a manner that causes or is likely to cause an unreasonable adverse effect (adverse effect means harm to humans, animals or the environment). Note that a person must comply with the specific requirements of the *IPMA* and IPMR, and **must take any additional steps that may be necessary to prevent an unreasonable adverse effect**.
- B. A person must use a pesticide in the manner specified on the label of the pesticide container.

Licence holders and holders of a registered PMP are required to comply with standards for the use of integrated pest management and the protection of human health and the environment as specified in the *IPMA* and IPMR. The Ministry of Environment may suspend or revoke a licence or confirmation, or order the person holding the licence or confirmation to refrain from using a pesticide for failure to comply with the *IPMA* or IPMR.

If a licence or PMP holder believes that the *IPMA* or IPMR has been contravened (by the licence or Pest Management Plan holder themselves, or by another person), in a manner involving the release of pesticide into the environment, they must give written notice to the Ministry of Environment as soon as possible after it comes to their attention [S.47(1)(e) & 72(1)(d)].

2.13 Standards for Storage, Transport and Use of Pesticides

Standards set out in the Regulation are intended to ensure that any person storing, transporting or using a pesticide does so only in a manner that minimizes hazards to human health and the environment.

2.14 Requirements for Use of Integrated Pest Management

A. Licence Holders



A licence holder may use a pesticide only after undertaking all of the following actions in accordance with integrated pest management principles (**Explanatory Notes 3.4.1 to 3.4.6**):

- identify and implement, or identify and advise the owner or manager of the treatment area, of reasonable measures to prevent pests;
- identify pest species and pest complexes to be managed;
- monitor to determine the population of pests and their locations;
- determine the injury threshold for each pest and apply it to the determination of when to use a pesticide;

Summary of Requirements

- select pest treatment methods based on:
 - ♦ consideration of practical alternatives to pesticide use, and
 - ♦ protection of human health and the environment; and
- evaluate, following each pesticide use, the effectiveness of that use [S.68].

A licensee conducting forest pest management must ensure that integrated pest management monitoring is conducted within an 18-month period before pesticide use [S.75(2)].

B. Pest Management Plan Holders [S. 69 IPMR]



A PMP holder may use, or authorize the use of, a pesticide only if the following actions are done in accordance with integrated pest management principles (EN 3.4.1 to 3.4.6):

- implement the reasonable measures to prevent pests identified in the Pest Management Plan;
- identify pest species and pest complexes to be managed;
- determine, on the basis of monitoring, the population of pests and their location, the environmental conditions and features of the treatment area, and the damage that has been or may be caused by the pests;
- determine the injury threshold for each pest and apply it to the determination of when to use a pesticide;
- select pest treatment methods (as identified in the related Pest Management Plan) based on:
 - ♦ consideration of practical alternatives to pesticide use, and
 - ♦ protection of human health and the environment; and
- make pre-treatment and post-treatment observations of the treatment area to evaluate the effectiveness and impact of each pesticide use.

A PMP holder conducting forest pest management must ensure that integrated pest management monitoring is conducted within an 18-month period before the pesticide use [S.75(2) IPMR].

2.15 Pesticide Transport, Storage and Use Requirements for Protection of People and the Environment

General Standards for all Licence and Pest Management Plan Holders [S.70 IPMR]



See EN 3.1.11. A container used to prepare, mix or apply a pesticide must not be washed or submerged in a body of water. Pesticides must be prevented from entering any body of water or irrigation system used to draw water from for the containment, preparation, mixing or application of a pesticide (i.e. backflow prevention is required).



Pesticide Containment (EN 3.6.1) [S.65 IPMR]:

A pesticide must be kept, handled, stored or transported in the container in which it was originally packaged and with the label originally affixed by the manufacturer, or in an appropriately designed and labeled container.⁷ The label must display the trade name of the pesticide, the name and concentration of the active agreement and the pesticide registration number.

⁷ One designed for the containment of the pesticide that will prevent unintended release. This requirement does not apply to tanks being used for mixing pesticides, or for holding pesticides during use.

Summary of Requirements



Pesticide Transport (EN 3.1.9) [S.33 (2) IPMR] [S.65(1)]:

Pesticides must be transported in a manner that is sufficient to prevent escape, discharge or unauthorized removal of the pesticide from the transport vehicle; and that prevents contamination of food or drink intended for human or animal consumption, or of household items such as furnishings, clothes, toiletries, or bedding.



Pesticide Storage (EN 3.6.1) [S.66 IPMR]:

Pesticides (other than domestic or excluded pesticides) must be stored in a storage facility that is:

- separated from (and not used for storage of) food intended for human or animal consumption;
- ventilated so that pesticide vapours are vented outside;
- locked when unattended; and
- accessible only to persons authorized by the person storing the pesticide.

Each door providing access to a pesticide storage facility must have a sign that is clearly visible to a person approaching, with the words “WARNING: CHEMICAL STORAGE – AUTHORIZED PERSONS ONLY” written in block letters. Fumigants and other pesticides that release vapours and bear a “poison” symbol on the label must be stored in a facility that is not attached to or within a building used for living accommodations.

Within 60 days after starting to store pesticides at a location, a pesticide licensee or confirmation holder must provide notice of the storage location to the fire department responsible for fire protection at that location [S.31 IPMR].



Preparing for Pesticide Use (EN 3.6.7 and 3.6.8)

A licensee and PMP holder must ensure that: (IPMR S.71(1)):

- each individual who will be using a pesticide is informed of:
 - ♦ the boundaries of the proposed treatment area,
 - ♦ the requirements for personal protection, and
 - ♦ the pesticide use procedures required to protect human health and the environment;
- the application equipment is in good working order and, if required, is calibrated to conform with the application rates on the pesticide label; and
- an inspection of the treatment area is carried out to ensure that the applicable regulatory requirements and standards can be met in carrying out the use [S.71(1)].

Summary of Requirements

Protecting People and the Environment

A licensee and PMP holder must ensure that the following precautions are taken in carrying out pesticide use [S.71(2)]:

-  • precautions to prevent unprotected human exposure to pesticide (**EN 3.6.9**);
-  • precautions to ensure that domestic water sources, agricultural water sources and soil used for agricultural crop production are protected for their intended use; (**EN 3.6.5**); and
-  • avoiding the use of pesticide over vertebrate wildlife or domestic animals that are visible to the user (**EN 3.6.10**).

A licensee and PMP holder **must not**:

-  • engage in broadcast spraying or foliar spraying outdoors if the wind speed exceeds 8 km an hour (**EN 3.6.6**) [S.71(7)]. For railway vegetation management, spraying may proceed when wind speeds are between 8 km an hour and 16 km an hour if a shrouded boom is used [S.76(3)];
-  • use a residual pesticide on water-saturated soil, during heavy rainfall or if heavy rainfall is imminent [S.71(9)(a)] (**EN 3.6.11**);
- spray a pesticide on foliage covered by ice or frost or if water is flowing on the foliage [S.71(9)(b)]; or
- spray a pesticide between 30 minutes after sunset and 30 minutes before sunrise, unless a lighting device is used so that the person applying the pesticide and the pesticide use are clearly visible from a distance of at least 30 m [S.71(8)].⁸

 A licensee and PMP holder must ensure that their use of an herbicide does not remove vegetation that is necessary to (**EN 3.6.2**):

- prevent erosion of a stream bank;
- prevent debris that would cause an unreasonable adverse effect from entering a stream; or
- maintain slope stability in areas where landslides have occurred [S.71(10)].

No-treatment Zones Around Wells, Water Intakes and Adjacent Property

 A 30 m no-treatment zone must be maintained around a water supply intake or well used for domestic or agricultural purposes (including water used for livestock or irrigation of crops) unless the licensee or PMP holder is “reasonably satisfied” that a smaller no-treatment zone is sufficient to ensure that pesticide from the use will not enter the intake or well [S.71(3), (4)] (**EN 3.6.5**).

 The licensee and PMP holder must ensure that a no-treatment zone between an outdoor pesticide use area and an adjacent property is sufficient to prevent the release of pesticide spray or runoff onto the adjacent property (unless the adjacent property owner or manager agrees otherwise) [S.71(6)] (**EN 3.6.12**).

⁸ This is the amended requirement as of October, 2006.

Summary of Requirements

Pesticide-free Zones and No-treatment Zones Around Bodies of Water, Dry Streams and Wetlands



The licensee and PMP holder must ensure that a minimum 10 m pesticide-free zone is maintained around or along bodies of water, dry streams and classified wetlands [S.73(1)]. The 10 m pesticide-free zone must be measured horizontally from the high water mark [S.73(2)] (EN 3.6.3).

A licensee and PMP holder must ensure that a no-treatment zone is maintained around the pesticide-free zone to protect the pesticide-free zone from pesticide contamination [S.73(3)].



Standards for the Use of Glyphosate for Forest Vegetation Management (EN 3.6.4)

A licensee or PMP holder using or authorizing the use of glyphosate may reduce the required pesticide-free zone to 2 m along or around a body of water or classified wetland if it is not fish bearing at any time of the year and selective application⁹ methods are used between 2 m and 10 m above the high water mark [S.75(3)].

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

- a temporary free-standing body of water;
- not a classified wetland nor a wildlife habitat feature; and
- not fish bearing and does not drain into a fish bearing body of water within 100 m [S.75(4)].

Glyphosate may be applied to a body of water, providing it meets the above three criteria and is either smaller than 25 m² or not a wetland [S.75(5)]. Glyphosate may be applied to a dry stream bed if the dry stream is not a wildlife habitat feature and is not fish bearing when wet [S.75(6) & (7)].



Standards for the Use of Glyphosate for Management of Noxious Weeds and Invasive Plants (EN 3.6.4)

A licensee or PMP holder using glyphosate for the management of noxious weeds or invasive plants on public land may reduce the 10 m pesticide-free zone to the following minimum pesticide-free zones or no-treatment zones for the specified situations:

- if the pesticide is used for the purpose of noxious weed or invasive plant management and if selective application is used between 1 m and 10 m above the high water mark, the pesticide-free zone may be reduced to 1 m [S.77(2)];
- glyphosate may be applied up to but not below the high water mark along and around a temporary, free-standing body of water that is not fish bearing at any time of the year and does not drain directly into a fish bearing body of water [S.74(2)]; and
- glyphosate may be applied over a dry stream that is not fish bearing at any time of the year and does not drain directly into a fish bearing body of water [S.74(2)].

⁹ “Selective application” means the application of a pesticide to individual plants so that the vegetation between individual plants is not treated.

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Standards for the Use of Glyphosate on Land Defined as an Industrial Site (EN 3.6.4)

A licensee or PMP holder using glyphosate on land defined as an industrial site may reduce the 10 m pesticide-free zone to the following minimum pesticide-free zones or no-treatment zones for the specified situations:

- along or around a body of water or classified wetland that is fish bearing or drains directly into a fish bearing body of water, or along a dry stream that when wet is fish bearing or drains directly into a fish bearing body of water, the pesticide-free zone may be reduced to 5 m, and further reduced to 2 m if the pesticide is applied to an industrial site that must be free of vegetation or if it is applied using selective application methods [S.74(1)(a & b)];
- along or around a body of water that is not fish bearing at any time of the year and does not drain directly into a fish bearing body of water, a minimum 2 m no-treatment zone must be maintained [S.74(1)(c)];
- along and around a temporary, free-standing body of water that is not fish bearing at any time of the year and does not drain directly into a fish bearing body of water, glyphosate may be applied up to but not below the high water mark of the body of water [S.74(2)]; and
- glyphosate may be applied over a dry stream that is not fish bearing at any time of the year and does not drain directly into a fish bearing body of water [S.74(2)].



Standards for the Use of Glyphosate on Railways (EN 3.6.4)

A licensee or PMP holder using glyphosate on land used for a railway may reduce the 10 m pesticide-free zone to the following minimum pesticide-free zones or no-treatment zones for the specified situations:

- along or around a body of water or classified wetland that is fish bearing or drains directly into a fish bearing body of water, or along a dry stream that when wet is fish bearing or drains directly into a fish bearing body of water, the pesticide-free zone may be reduced to 5 m, and further reduced to 2 m if the treatment area is railway ballast, signal switch or yard, or if glyphosate is applied using selective application methods [S.74(1)(a and b)];
- along or around a body of water that is not fish bearing at any time of the year and does not drain directly into a fish bearing body of water, the pesticide-free zone may be reduced to a 2 m no-treatment zone [S.74(1)(c)];
- along or around a body of water that is a temporary, free-standing body of water that is not fish bearing at any time of the year and does not drain directly into fish bearing waters the pesticide-free zone may be reduced to a 1 m no-treatment zone if the pesticide is applied to railway ballast or yards [S.76(5)];
- along or around a body of water that is a temporary, free-standing body of water, or a dry stream, that is not fish bearing at any time of the year and does not drain directly into fish bearing waters, the pesticide-free zone may be reduced to a 1 m no-treatment zone if the treatment is selective application to trees at highway crossings along the right-of-way [S.76(6)];
- along or around a temporary, free-standing body of water that is not fish bearing at any time of the year and does not drain directly into a fish bearing body of water, glyphosate may be applied up to but not below the high water mark of the body of water [S.74(2)]; and
- glyphosate may be applied over a dry stream that is not fish bearing at any time of the year and does not drain directly into a fish bearing body of water [S.74(2)].

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Additional Standards for Management of Noxious Weeds and Invasive Plants¹⁰ (EN 3.6.13)

A licensee or PMP holder applying a herbicide for the purpose of noxious weed or invasive plant management must apply the herbicide not more than 1.5 m from a targeted weed or plant [S.77(1)].

A licensee or Pest Management Plan holder using a pesticide for noxious weed or invasive plant management must make reasonable efforts to identify sites where biological weed control organisms have been released and prevent harm to those organisms [S.77(3)].

Additional Standards Specific to Vegetation Management on Railways

- pesticide may not be applied from an aircraft ([S.76(1)]);
- pesticide must not be applied to *Rubus* species of plants that are more than 3 m away from rails, signals or switch stands from the time the flowers open until the berries have predominantly dropped from the vines [S.76(2)];
- pesticide may be sprayed when wind speeds are between 8 km an hour and 16 km an hour if a shrouded boom is used [S.76(3)]; and
- pesticide may be applied from a moving vehicle if a shrouded boom is used and the vehicle speed is not more than 30 km an hour. If a shrouded boom is not used, the vehicle speed must not be more than 16 km an hour [S.76(4)].

2.16 Reporting and Record Keeping Requirements

Record Keeping

Records required under the IPMR must be kept up to date, at the business location identified on the licence application or pesticide use notice (except when being kept at or near the treatment location during the use), and for a period of (at least) three years after the use or application to which they relate. The licensee or PMP holder must ensure that records are at their specified business location within 60 days after completion of the related pesticide use [S.83].

Records of Use



Licensee and PMP holders must maintain a record of use for each treatment location and day of use that includes the following information [S.35 & 37 IPMR] (**EN 3.7.1**):

- the date and time of the pesticide use;
- the name of the pest targeted by, or the purpose of, the pesticide use;
- the trade name of each pesticide used and its registration number under the federal Act;
- for each pesticide used, the method and rate of application and total quantity used;
- if the use was outdoors, the prevailing meteorological conditions, including temperature, precipitation and velocity and direction of the wind (**EN 3.7.1**);
- advice given to the owner or manager of the treatment area, including safe re-entry time, the number of days before a crop can be harvested safely (where applicable), and any additional precautions that should be taken to minimize exposure to the pesticide; and



¹⁰ Noxious weed means a weed listed as noxious under the *Weed Control Act*. Invasive plant means a plant listed as invasive under the *Forest and Range Practices Act*.

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- if the licensee or PMP holder decided that the 30 m no-treatment zone around a water supply intake or well used for domestic or agricultural purposes may be reduced, the information on which the licensee based the decision (**EN 3.6.5**).

Licence holders are also required to maintain a record of pesticide use for each treatment location and day of use that includes [S.35]:

- if the use was performed as a service, the name and address of the person for whom the service was performed;
- if the service was performed for another licensee (or permit holder or PMP holder), the number of the person's licence (or permit or PMP Confirmation);
- if the use was not performed as a service, the name and address of the owner or manager of the treatment location;
- the name and certificate number of the certified applicator who used or supervised the use of the pesticide; and
- pest monitoring methods and injury thresholds used to fulfill the licensee's IPM requirements in relation to the use (see below for additional requirements for treatment of more than 20 ha/year of private forest land).

Pest Management Plan holders [S.37] and private forest land licensees treating more than 20 ha/year [S.35(2)] are also required to maintain the following records for each treatment location:

- the results of pest monitoring carried out by the confirmation holder in relation to the pest population and the damage caused by pests;
- the use of monitoring results to determine injury thresholds;
- how public notification was given and where notices were posted;
- the effectiveness and impacts of the pesticide use; and
- for each piece of application equipment that requires calibration – when the equipment was calibrated, and the data upon which its calibration was based.

Permit holders [S.37(1)(d) IPMR]: if a permit was required for the use or class of pesticide then permit number must be recorded.

Public Consultation Records

A PMP holder must prepare and maintain the following records of public consultations [S.38]:

- a record of when and in what newspaper the notice was published or when the notice was given of the public consultation;
- a summary of the verbal public responses to the public consultation;
- a summary of the responses given by a proponent to the public responses received during consultations;
- copies of any notices published or given under notification requirements of the IPMR;
- all written responses to the notices; and
- if the PMP holder agrees through consultations to give notice to an individual before pesticide use, a copy of the notice given to the individuals.

Summary of Requirements

Annual Use Reports

Licensee and PMP holders must submit an annual report of pesticide use to the Administrator by January 31 of every year (a summary of the previous calendar year's use) [S.39]. The annual report must include:

- the name and address of the licensee or PMP holder and their licence or confirmation number;
- for each pesticide used in the calendar year, the trade name, registration number under the federal Act, active ingredient name(s) and amount of pesticide product used in kilograms; and
- the total area treated.¹¹

A licensee treating more than 20 ha a year of private forest land and all PMP holders must also provide the following information [S.39(4) IPMR]:



- a description of the treatment location and a map identifying its gross boundaries (**EN 3.7.2**);
- the methods used to apply pesticide;
- the total area treated (i.e., with all pesticides used) and total area treated with each pesticide used; and
- methods of non-pesticide pest controls used and the estimated total area of their use.

¹¹ For the purposes of annual reporting, if an area is treated more than once, the “area treated” is recorded (i.e. not a multiple or cumulative figure, dependent on the area of each treatment).

3. EXPLANATORY NOTES ON SELECTED REQUIREMENTS

Each explanatory note may have the following components:

1. **Relevant IPMR Section(s):** a copy of the specific sections of the IPMR relevant to the issue.
2. **Reason for the Requirement(s):** what the Ministry expects will be achieved by the requirement toward protecting human health and the environment and promoting use of integrated pest management.
3. **Explanations:** information that may be necessary to consider in selecting ways to meet the requirement.
4. **Additional Information:** may include diagrams, record keeping forms or lists of references.

3.1 Content of Pest Management Plans

For registration with the Ministry, a PMP must include the information detailed in IPMR S.58(1). These requirements can be summarized as the following types of information:

- (a) general information on where the proposed pest management will take place, the person responsible and principal contact;
- (b) use of Integrated Pest Management (IPM);
- (c) operational information on safely transporting, storing, mixing and applying, disposal and spill response;
- (d) environmental protection strategies such as; protecting water sources, protecting fish and wildlife habitat, protecting food, pre-treatment inspection procedures, calibrating application equipment, and monitoring weather conditions; and
- (e) identifying each pesticide and how each will be applied, specifying types of equipment.



There are six **explanatory notes (3.1.3 to 3.1.8)** on considerations for the use of IPM and its incorporation in PMPs. Integrated Pest Management is defined in the *IPMA* and the definition is provided below.

“Integrated pest management means a process for managing pest populations that includes the following elements:

- a. planning and managing ecosystems to prevent organisms from becoming pests;
- b. identifying pest problems and potential pest problems;
- c. monitoring populations of pests and beneficial organisms, damage caused by pests and environmental conditions;
- d. using injury thresholds in making treatment decisions;
- e. suppressing pest populations to acceptable levels using strategies based on considerations of:

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- i. biological, physical, cultural, mechanical, behavioral and chemical controls in appropriate combinations, and
 - ii. environmental and human health protection; and
- f. evaluating the effectiveness of pest management treatments.”

The PMP provides an opportunity for a proponent to explain how they will use the IPM process for their particular pest problem. The Ministry objective is that pesticides are only used where appropriate within an IPM process to control pests in their specific operational programs.

Some goals of an effective IPM process are:

- risk reduction to human health and the environment;
- if pesticides are necessary, improving their use to make them as selective and low risk as possible; and
- research on and adoption of technologies and practices that produce more effective and longer term results.

IPM programs are knowledge-based with a heavy emphasis on collecting information and assessing it prior to making management decisions. The Ministry recognizes that IPM programs will likely change and improve as people gain experience and as new products, tools and information become available. The Ministry anticipates that for some pests and locations, pest managers will start with a simple IPM approach and move to a more comprehensive approach as more information is obtained. As such, it will likely need to be amended as new products, tools and information become available.

PMPs should be as inclusive as possible of the range of likely activities that may be conducted (pesticides, method of application, IPM procedures) so that consultation is conducted with full disclosure of all likely activities. Once the operations begin, it is expected, by the public and the Ministry, that work will be conducted as specified in the PMP. If there are situations that require an unforeseen change, it will be necessary to amend the PMP. See **EN 3.2.3** regarding amending a PMP.



The *IPMA* requires that proponents develop a PMP in accordance with the regulations and that pesticides are used in accordance with the PMP as it is registered in the PUN [*IPMA* S.7(1)(a)].

The *IPMR* specifies the topics to be discussed in the PMP (*IPMR* S.58(2)) to clearly outline the IPM program that will be implemented. The PMP is to state exactly how IPM will be used and how the environment and human health will be protected when employing pesticides as part of a pest management program. Requirements for consultation are intended to ensure that significant issues and concerns are identified, considered and addressed. The operational requirements for using IPM as it is described in the PMP before using a pesticide are outlined in *IPMR* S.68 for licensees and S.69 for confirmation holders.

Proponents developing a PMP should refer to Explanatory Notes in 3.4 for additional information when building their IPM program.

Explanatory Notes – Content of Pest Management Plans

The PMP is subject to public consultation not only to notify interested parties but to provide them an opportunity to comment and supply information (such as location of water supply systems and particular land uses). This process allows for the PMP to be improved prior to registration with the Ministry of Environment. The Ministry wants to be assured that relevant issues brought forward by concerned parties are discussed in the finalized PMP. The Ministry will review a PMP if there is a substantive complaint of inadequate information and will review selected PMPs as part of their general inspections for compliance.

Because the PMP process is meant to engage the public, the objectives, intended treatment methods and location of treatment areas outlined in a PMP should be as easy to understand as possible. However, enough detail should be present to direct activities and outline the decision-making process that will be used. Proponents may consider including visual depictions like maps, diagrams and photographs in order to facilitate understanding if they feel this would improve communication.

Proponents should take care when referencing outside documents in a PMP. It should be clear whether references provide background about how preventative strategies were developed or if referenced documents are part of the IPM program. Proponents should restrict the references for operational commitments to relevant pages only, not the entire document. Referenced documents should be easily obtainable by staff and contractors who are working under the PMP and by the Ministry and the public who may review the document.

Examples provided in the Explanatory Notes are meant to provide guidance on ways to meet obligations under the IPMR. These examples are not required to be included in PMPs nor do they present a complete list of potential ways to meet the requirements. Examples are provided to clarify considerations proponents should address and the level of detail expected by the Ministry when developing and implementing PMPs. However, many of these examples are standard industry practices and if proponents choose to deviate from standard industry practices, they should sufficiently justify their reasoning. When Ministry staff assesses IPM programs, they typically explore how the IPM elements of a PMP interact to create a rational and logical program.

Proponents should build PMPs with the goal of demonstrating due diligence. All required information relating to the proposed IPM program should be adequately explored and sufficiently addressed in the PMP. Proponents should justify their decisions and explain in the PMP how the proposed use will not result in unreasonable adverse impact. Ministry staff may request a proponent explain the reasoning behind a proposed use. If a satisfactory explanation is not provided, the Ministry may request that the proponent amend their PMP to ensure their PMP is in compliance with the IPMR. Section 7(1)(a) of the *IPMA* states that a proponent may not use a pesticide for a prescribed use unless they have a PMP that complies with the IPMR. In more serious cases, the Ministry may consider revoking or suspending the Confirmation if the holder is not complying with the *IPMA* or IPMR or the holder's use of pesticide is causing or is likely to cause an unreasonable adverse effect.

Checklists are useful to demonstrate due diligence, especially if licensees will be contracted to apply pesticide. While not mandatory, checklists can be used to ensure information has been

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conveyed or procedures have been followed. These checklists can be signed by staff or a contractor involved in implementing a PMP to demonstrate that a confirmation holder has provided adequate instruction.

3.1.1 Description of Geographic Boundaries and Inclusion of Maps or Diagrams Showing Proposed Treatment Areas

Relevant Regulation Section

58(1)(a) *A Pest Management Plan prepared for the purpose of section 7(1)(a) of the Act must include the following identifying information: (a) a description of the geographic boundaries of the area to which the plan applies and maps or diagrams showing proposed treatment areas within that area.*

Reason for this Requirement

The information required under IPMR 58(1)(a) should allow a concerned person to consider whether the location of the proposed treatments will impact their interests.

Explanations

The description of geographic boundaries should be at a large scale, such as the boundaries of one or more Regional Districts, specified watersheds or the whole province, excluding specified areas.

The scale of the map or diagram showing proposed treatment areas should be sufficient to allow identification of the gross boundaries of those areas (e.g., showing the boundaries of a forest district, timber supply area, regional district, railway line, pipeline corridor, or industrial substation sites). The maps or diagrams should show the relative locations of communities and major bodies of water such as lakes, rivers, and marine shoreline. The map or diagram should include areas that may require treatment but are yet to be confirmed (i.e. areas that require additional monitoring to determine the need for treatment).

A description of the geographic boundaries may include a list of facilities with street addresses or GPS coordinates.

Sometimes the PMP boundary is so large the map does not allow for features to be displayed such that readers are able to determine if their interests are in close proximity to potential treatment sites. In these cases, in addition to a map or diagram, proponents should provide a method for interested readers to gather sufficient information to determine if their interests may be impacted.

The PMP, together with maps or diagrams, is to be available for viewing during the consultation period and the period for which the PMP is registered (maximum 5 years), so that a person can contact the proponent about any concerns [S.7(6)(a) *IPMA* and 61(1)(i) *IPMR*].

The map or diagrams associated with the PMP do not require the level of detail as maps required to accompany the Notice of Intent to Treat (NIT). The Ministry does not expect PMP maps to

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include the specific details of treatment areas such as the no-treatment zones or pesticide-free zones. These details are often not developed until the year of treatment and would then be incorporated in the detailed maps that support the annual NIT that must be provided to the Ministry of Environment (IPMR S.42). **EN 3.3.1** covers the preparation of detailed maps and diagrams of proposed treatment areas.



All areas potentially to be treated with pesticides should be identified in the PMP. If new pesticide use areas (that fall outside the original geographic boundaries described in the PMP) are identified after public consultation has been completed, there must be additional consultation regarding the new area. The PMP must then be amended to reflect the new areas, an amended Pesticide Use Notice (PUN) must be sent to the Ministry of Environment following the required consultation (IPMR 59(2) & 27(2) – **EN 3.2.3**), and a Confirmation of amendment must be received from the Ministry before pesticides may be used in the new areas. The PMP should reflect the current IPM program so that an interested person can obtain a copy of the plan at any time during its term and understand how treatments may be used.

3.1.2 Identification of the Person Responsible and the Principle Contact

Relevant Regulation Sections

58(1)(b) & (c) *A Pest Management Plan prepared for the purpose of section 7(1)(a) of the Act must include the following identifying information:*

- (b) *the person responsible for managing pests in relation to the land described in paragraph (a) [geographic boundaries of the plan]*
- (c) *the name and phone number of an individual who is the principal contact for information relating to the Pest Management Plan.*

Reason for these Requirements

The PMP is to provide information so that interested parties can readily identify and contact the company and individual who is responsible for the PMP.

Explanations

The PMP is to identify both the person responsible for the work and an individual who can be contacted. The responsible person should be the owner or manager of the proposed treatment area but may not be the primary contact. The “person” responsible may be a limited company, corporation, or government agency (this person is referred to as the ‘proponent’ throughout these Explanatory Notes). The responsible person must sign the Pesticide Use Notice (PUN).

A proponent may choose to engage a consultant to develop and/or implement a PMP and may request that the consultant be the principle contact. In such a case, the individual named as the contact must be able to provide information, answer questions and provide copies of the plan when requested. If a contractor is named and their services are terminated, the proponent must amend the PMP and identify a new contact.

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The contact person should be someone who has knowledge of the PMP and implementation of treatments. This may be the proponent's staff member or a contractor. If a proponent's staff member is the contact, it is recommended that this person is the most senior qualified pest management individual who has decision-making powers regarding development and implementation of the PMP.

3.1.3 Pest Prevention

Relevant Regulation Section

58(2)(a) *A Pest Management Plan prepared for the purpose of section 7(1)(a) of the Act must include the following integrated pest management elements: (a) a description of the program that will be employed to prevent organisms from becoming pests.*

Reason for this Requirement

A pest prevention program is to be developed where reasonable to minimize the need for control measures. The discussion of prevention in the PMP is to confirm that the proponent has considered all applicable prevention methods and has determined whether they are reasonable for the particular vegetation to be managed. This section should also include a description of how they are to be implemented.

Explanations

Link between Pest Management Plan and Operations

IPMR 69(1)(a) specifies that a pesticide may be used only after implementing the reasonable measures to prevent pests identified in the PMP (see **EN 3.4.1** on the operational use of prevention).



Prevention Considerations

Pest prevention for vegetation management programs means activities aimed primarily at preventing the establishment and spread, as well as minimizing impacts, of unwanted vegetation to prevent the need for treatments. Proponents should strive to find long-term solutions to pest problems so as to avoid the need for treatment.

The PMP should describe prevention in enough detail for the public and the Ministry to have a clear understanding of the methods that have been considered, which methods are to be used, how they will be implemented and how they will be useful in reducing the need for control options. For example, if prevention is to include seeding of disturbed areas, the discussion could include how the disturbed sites will be identified, when and how they will be seeded and to what extent this should reduce the need for control options in specified areas. The discussion can reference information sources in other documents that were used to prepare the pest prevention program, such as **specific pages** in industry technical documents, IPM manuals or reports prepared by IPM consultants and qualified professionals.

If no prevention methods were found to be practical to implement, the PMP should include reasons why this conclusion was reached, particularly if standard industry practices are not to be used. If cost is a major reason, details to support this claim must be included.

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The following are some examples of prevention methods that are typically considered and/or implemented for different types of vegetation management programs. The examples listed below are not mandatory nor an exhaustive list of activities that would be considered compliant in meeting the requirements under this section of the IPMR.

Forest Vegetation Management

The *Forest and Range Practices Act* specifies requirements for a plantation of new crop trees to be established following harvesting. Preventing or reducing the impact of other vegetation on the planting or growth of new crop trees is often a major consideration in meeting free growing obligations. Strategies used to encourage seedling growth relative to pests and reducing pest establishment or development would be considered preventative strategies.

Examples of prevention methods for forest pest management could include planting large vigorous stock as soon as possible following harvesting on brush prone sites to increase their competitive advantage and utilizing good micro sites for planting seedlings. **Chemical site preparation is not considered a prevention activity in an IPM program.**

Noxious Weed and Invasive Plant Management

Prevention can be an important aspect of managing noxious weed and invasive plant species, and generally involves reducing their spread. It can be difficult to reduce the spread of seeds and plant parts by natural vectors (e.g., wind, water and wildlife), but reducing human activities responsible for their introduction and spread is sometimes possible.

Examples of preventative measures for noxious weeds and invasive plants could include inspecting vehicles when leaving infested areas to ensure weed plant materials have not become attached to the undercarriage and timely seeding of disturbed areas.

Industrial Vegetation Management

Prevention methods for industrial vegetation management can include minimizing the initial growth and spread of undesirable vegetation on existing sites, or steps to prevent growth of undesirable vegetation during construction or upgrading of sites.

Examples of measures to prevent vegetation impacts on industrial sites could include:

- installing surfacing materials to serve as a barrier to prevent unwanted vegetation becoming established;
- establishing stable, low-growing plant communities that prevent growth of unwanted, taller species on electrical transmission and distribution corridors; and
- eliminating seed sources, by preventing leakage of grain products during loading and transport on railways.

Additional Sources of Information

Further information may be obtained from references 1, 2 and 3 in Appendix 1.

3.1.4 Pest Identification

Relevant Regulation Section

58(2)(b) *A Pest Management Plan prepared for the purpose of section 7(1)(a) of the Act must include the following integrated pest management elements: either (i) a description of the program that will be employed to identify pests targeted by the plan or (ii) identification of the pests targeted by the plan.*

Reason for this Requirement

Pests must be identified so that their biology can be researched and incorporated into an IPM program. Some species may not cause significant impacts and are not considered pests. It is important to ensure only organisms that are actually pests are subjected to the control options. If a pesticide is required, the target pests must also be adequately identified to ensure the pesticide is used only on pests for which it is registered. In addition, correct identification of species confirming them as noxious (*Weed Act*) or invasive (*Forest and Range Act*) will allow proponents to access the Pesticide Free Zone reductions in Section 77 of the IPMR.

Explanations

Link between Pest Management Plan and Operations



IPMR 69(1)(b) specifies that a pesticide may be used only after identifying pest species and pest complexes to be managed (see **EN 3.4.2** on the operational use of identification). The identification process described in the PMP should be employed to meet this requirement.

Identification Considerations

It is important to correctly identify pests to be managed as monitoring methods and injury thresholds may be specific to a particular species. Furthermore, treatment options and delivery mechanisms may be influenced by the pest targeted.

The level to which various plants need to be identified can vary considerably. This may depend on factors such as the potential impact of the pest as well as the cost and effort of its identification. For example, if there are safety concerns regarding fire from vegetation, the presence of any plant in the facility may meet the threshold to trigger the need for treatment without further analysis. If identification of a pest to species is extremely difficult or requires costly laboratory analysis, it may be sufficient to identify only to the genus if this still meets PMP objectives.

In some cases, such as for noxious weed management, it may be important to accurately identify a weed to the species level because only those plants must be controlled. This may be important to reduce non-target treatment which could decrease the ability of susceptible habitat to resist future colonization of pests.

For forestry and industrial vegetation management it may not be necessary to identify plants to the species level, particularly if a number of commonly associated plants together, may be the pest problem that requires treatment (e.g., impacting growth of forest crop seedlings). In such

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cases, the plant association or “complex” can be identified – usually by identifying a sufficient number of the most common species to uniquely characterize the complex. The reason should be given as to why identification of plants to a particular level was considered appropriate (for example: “The target species are to include all grasses, herbaceous and woody plants colonizing the gravel bed to prevent fire hazard”).

If plant species or complexes have not been identified, the process for identification of pests to be managed under the PMP must be described. This should include when this will be done and can include minimum qualifications of the person conducting the identification if relevant (i.e., wildlife danger tree assessor certificate). The description should provide confirmation that pest identification is used to plan pest management strategies and that it will be performed by individuals with adequate knowledge and skill.

Additional Sources of Information

Further information may be obtained from references 4, 5, 6 and 7, 8 in Appendix 1.

3.1.5 Pest Monitoring

Relevant Regulation Sections

58(2)(c) *A Pest Management Plan prepared for the purpose of section 7(1)(a) of the Act must include the following integrated pest management elements: a description of the monitoring program that will be employed before or during the pesticide use for assessing pest populations, environmental conditions and damage caused by pests, which program must include a description of:*

- (i) the monitoring methods,*
- (ii) the frequency of monitoring, and,*
- (iii) the data that will be collected.*

Reason for these Requirements

Monitoring is required to assess the distribution and abundance of the pest(s) to ensure that if treatment is required, it is only applied in areas where it was determined that the pest(s) exceeded, or will exceed, the established injury threshold (see IPMR S.58(2)(d) – **EN 3.1.6** on the definition of injury threshold). The monitoring information in the PMP is to confirm that a monitoring program has been designed and will be used to achieve this objective.

Explanations

Link between Pest Management Plan and Operations

IPMR section 69(1)(c) requires that a pesticide may be used only after determining, on the basis of monitoring – (i) the population of pests and their location, (ii) the environmental conditions and features of the treatment area, and (iii) the damage that has been or may be caused by the pests (see **EN 3.4.3** on the operational use of monitoring). Information in the PMP should show how these operational requirements will be achieved. Pursuant to [S.35(2) IPMR], licensees conducting forest pest management activities on more than 20 ha on private forestlands must keep a record of the pest monitoring results as identified in 58(2)(c)(iii).

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Monitoring Considerations

Monitoring typically involves a series of observations to obtain information about a pest population and the environment and should include:

- documentation of the distribution and abundance of pests, whether the pest population is increasing or decreasing and whether herbivores or competing plants are or will significantly impact the pest population (Note: IPMR S.77(3) requires noxious weed programs to attempt to identify sites where biological release programs are active and try to prevent harm to those organisms);
- documentation of environmental features and conditions to assist in determining when or where treatment may be required and if required, what type of treatment may be possible (e.g., differing moisture and soil types and the presence of wetlands or bodies of water may influence treatment decisions); and
- determination of the level of damage the pest population will cause and whether the pest population has reached the injury threshold (the point at which the abundance of pests and the damage they are causing or are likely to cause, indicates that pest control is necessary or desirable).

Repeated observations may be required to determine how quickly plants will grow to cause significant damage, if ever.

Monitoring information that should be included in a PMP includes the following:

- a. Monitoring methods: how monitoring sites will be selected and visited (e.g., using ground patrols or aerial surveys), how levels of pest density or damage will be assessed (e.g., through density counts, height measurements or visual estimates), and how relevant environmental conditions will be measured (i.e., anemometer for wind speed).
- b. Frequency of monitoring: how often sites will be visited to ensure adequate monitoring. If high priority or high risk sites are visited more frequently, this should be described; and
- c. Data that will be collected: relevant factors that will be assessed with each monitoring visit (e.g., density of vegetation, height of trees, depth of roots, species of weeds present, species of non-target plants present, density of bio-control agents, soil type, slope, aspect, water levels in wetland areas). If relevant data will be collected by other organizations, this should be described.

In many industries, there are standard industry practices for monitoring the density or percent cover of pests, such as sample quadrats or transects. If these practices are not used, proponents should be able to justify their deviation from such practices. Quantitative sampling may not always be practical nor possible and in such cases it may be sufficient to collect qualitative data through a visual examination. However, sufficient observations should be made and the person making the observations should have adequate skill to achieve reliable and consistent results. Proponents should attempt to collect quantitative data to provide accuracy, be reproducible and be comparable to evaluation monitoring data. Quantitative data should facilitate evaluation of the IPM program or proponents should at least adopt qualitative methods that strive for standardization to meet this goal.

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Proponents are expected to have developed a system to record monitoring data to use for determining if treatment is warranted and for evaluation of their IPM program. Monitoring record forms are one good way to achieve this. Such forms can be incorporated in the PMP to show what information will be collected (see example that follows). This may provide a way for proponents to easily meet the requirement without a lengthy description.



The program for pre-treatment monitoring for pest abundance and impacts should be designed so that it can be used together with post-treatment monitoring to assess treatment effectiveness (see **EN 3.1.8**). This may be accomplished by establishing pre-and post-treatment observation sites. Evaluating damage caused by unwanted vegetation or individual plants is important to support injury threshold determinations. The PMP should describe the criteria used to determine that the injury threshold has or will be exceeded, such as cover or height of plants. Monitoring programs must be designed to incorporate threshold treatment decisions.

The following are some considerations for the pest monitoring to be included in a PMP for different types of vegetation management.

Forest Vegetation Management

Forest management operations typically employ several types of vegetation surveys that could be incorporated in the monitoring content of a PMP. The data from these surveys should be of appropriate quality to reliably determine the current and expected impact of the competing vegetation on crop tree performance. The surveys may be visual assessments or involve measurements of height, diameter and vigour of crop trees. It is also important to monitor for wildlife use and potential habitat values that should be considered when factoring in treatment decisions.

Examples of forestry surveys that may be included in a PMP monitoring program include regeneration surveys, stocking/brushing surveys, and walkthrough surveys. A combination of survey types may be required to provide sufficient timely information to evaluate the need for treatment. Please note that monitoring requirements in relation to forestry uses of a pesticide must be conducted within an eighteen month period prior to the pesticide use (IPMR S.75(2)).

Noxious Weed and Invasive Plant Management

The monitoring program described in a PMP for a noxious weed or invasive plant management program can reference surveys and information from a number of sources. The assessment of distribution and rate of spread may be determined from reports by land managers or observations during previous treatments and by follow up visits to significant sites that received treatment. As noxious weed and invasive plant programs may have a threshold of zero, the need for a sophisticated and well described monitoring system is less important. The final monitoring is often done immediately before treatment and may simply involve treatment of all target plants observed, or observations may be made of various factors to assess the priority for treating target plants (see **EN 3.1.6** on injury thresholds).



Monitoring of noxious weed and invasive plant populations is typically done with visual observations to document the extent of an infestation, generally recorded as area infested or as a percentage cover or number of plants per unit area. The manner of recording these observations

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should be described in the PMP (such as on maps or survey forms). If the program is utilizing the Invasive Alien Plant database sponsored by the Ministry of Forests, Lands and Natural Resource Operations, this should be referenced with a description of how it is to be used.

Noxious weeds and invasive plants have already been determined to be damaging (hence are designated under the *Weed Act* or Invasive Plants Regulation under the *Forest and Range Practices Act*) so monitoring does not have to include observations on potential damage they cause – unless it is used in assessing the priority for treatment in an area. However, it may be desirable to include in the monitoring program, observations to assess conditions that are promoting spread of the noxious or invasive plants.

Industrial Vegetation

Industrial vegetation management objectives and hence monitoring programs can be quite varied. Some programs may have thresholds with a low tolerance for any vegetation, such as around gas and oil wells or electrical facilities due to legal requirements and safety considerations. In such cases, monitoring may be conducted immediately before the treatment of all vegetation observed. Other programs may require repeated observations to determine which plants are damaging and when they should be treated, if ever. In some cases, early detection of unwanted types of vegetation may be important to prevent seed production and spread to adjacent areas and to ensure a wide range of treatment methods can be used. The rationale for the type of monitoring and the record keeping system should be documented in the PMP.

Additional Sources of Information

Further information may be obtained from references 8, 9, 10 and 11 in Appendix 1.

3.1.6 Injury Thresholds

Relevant Regulation Section

58(2)(d) *A Pest Management Plan prepared for the purpose of section 7(1)(a) of the Act must include the following integrated pest management elements: a description of the injury thresholds that will be applied in deciding whether a pesticide treatment is necessary, and an explanation of:*

- (i) *how the thresholds were chosen, and*
- (ii) *how the thresholds will be applied.*

Definition (Section 1):

“injury threshold” means the point at which the abundance of pests and the damage they are causing or are likely to cause indicates that pest control is necessary or desirable.

Reason for this Requirement

Injury thresholds need to be determined and used (in conjunction with monitoring) to ensure that control options are used only where the level of current or anticipated damage caused by the pest is sufficient to justify their use. The PMP must outline the thresholds that will be used, how they were chosen, and how they will be operationally applied in the field. This description must demonstrate to the public and the Ministry that reasonable thresholds were established and that treatment methods will be used only where monitoring indicates the thresholds have or will be exceeded.

Explanations

Link between Pest Management Plan and Operations

IPMR 69(1)(d) specifies that a pesticide may be used only after determining the injury threshold for each pest and applying it to the determination of when to use a pesticide (see **EN 3.4.4** on the operational use of thresholds). A record must be kept of the injury thresholds used for each treatment location **EN 3.1.5**.



Injury Threshold Considerations

Determining when problem vegetation reaches thresholds of unacceptable damage or impact can be difficult, and varies for different industry sectors. Damage may include reduced economic values, reduced public safety, fire hazard, damage to equipment or facilities or impacts on native ecosystems. Often there are programs with multiple pests, different management objectives and different injury thresholds under a single PMP. In such cases, it will be necessary to identify the location, characteristics and injury thresholds of the different management areas. One model that has been used is the operating zone model developed in conjunction with the Ministry for forestry IPM programs under the previous regulatory system. This model adequately addressed site specific concerns and outlined a decision-making system based on variation of criteria throughout the PMP boundary.

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The Ministry expects that a threshold will be developed to meet operational needs while minimizing unnecessary pesticide use. Thresholds should be quantitative to enable clear and consistent decision making. The Ministry recognizes that it is often necessary to set preliminary thresholds and then refine these as further data and experience is gained. If the threshold and its justification are well described in a reference document or guide, it is acceptable to simply reference the relevant publication and page number. Potential sources for researching thresholds for referencing could include company policies, standard industry practices, reference guides, federal and provincial legislation and pest management experts. If the justification for setting thresholds is not referenced externally, it is expected that proponents include a detailed description based on sound reasoning and quality information. Note that statements such as “pests will be treated once they reach a level that will impact operational objectives” are not considered sufficient. These “results-based planning” statements do not provide sufficient direction when control measures are to be implemented.

The following are some considerations for the development of injury thresholds for different types of vegetation management. Descriptions in a PMP should clearly identify how pests may prevent operational objectives from being achieved.

Forest Vegetation Management

For forestry, the selection of injury thresholds for problem vegetation is often based on the need to meet the free growing standards for crop trees, required under the *Forest and Range Practices Act*.

Examples of impacts from competing vegetation on crop trees that may be used in determining injury thresholds, include:

- reducing moisture, nutrients or soil temperature or excessively shading crop trees, reducing their vigour or development;
- damaging crop trees due to excessive snow press of competing vegetation; and
- releasing chemicals (allelochemicals) that reduce crop tree vigour or development.

Injury thresholds may incorporate an index of competition using such factors as vegetative cover or height to diameter ratios. Vegetation within the effective growing space of a crop tree (generally within a 1 m radius) is usually the focus when assessing levels of competition.

The cumulative damage/density of several species of competing vegetation (a pest complex) is generally determined when setting treatment thresholds and applying treatment decisions in the field.

Noxious and Invasive Plant Management

Plants are designated as noxious or invasive in B.C. because they can cause significant damage to agriculture, forestry, or native ecosystems. There is often no acceptable abundance of these plants. In practice, however, the degree of control that can be implemented for a specific plant in a specified area will depend on factors such as how widespread it is, how rapidly it is spreading, the degree of damage it causes and the susceptibility of the surrounding habitat to infestation. Thresholds may be based on operational capacity or the presence of established containment areas and may be influenced by the program’s operational budget.

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Most noxious weed and invasive plant committees have adopted a system of categorizing noxious weed and invasive plant species and the sites where they are located in order to establish priorities for control programs. Systems such the one used by the BC Ministry of Forests, Lands & Natural Resource Operations can be used to help justify the need for the level of program required, especially where there are several pests managed under a PMP and with varying degrees of likelihood of treatment. The tables listed in Appendix 3 illustrate how various combinations of plant categories and site priorities are used to establish the level of treatment priority. Ideally, the thresholds section of a PMP would reference the use of such systems to confirm that there was an assessment of the need for a particular intensity of noxious weed and invasive plant management in a specified area. Please note this threshold matrix example may have been revised in the current version of the PMP.

Industrial Vegetation Management

Consideration of worker safety, maintenance of infrastructure (e.g., rail bed, ties), public and environmental safety (e.g., restricting site lines, risk of fire), and impeding inspections or maintenance (e.g., access, visual location or markers) are examples of unacceptable damage that may be used to develop injury thresholds. It is expected that the reasoning justifying thresholds chosen is explained clearly in the PMP.

In some cases, injury thresholds may be based on the number or cover of weed species present at a site. In other cases, the injury threshold may be based on the size of specific problem species such as those with deep roots or which grow too tall.

The following is an example of the format that could be used in a PMP for injury threshold information, based on plant height. While it is not necessary to follow this format, the example does provide clarification on the level of detail expected in a PMP for the proponent to explain their decision to treat the pest.

Issue: Tall-growing shrub and tree species must be managed to prevent them from reaching a specified distance from a transmission line to prevent risk of fire, electrocution of people and power disruption.

Thresholds: The thresholds are minimum distances between the conductor and vegetation as shown in the following table:

Voltage	xxV	xxV	xxV	xxV	xxV
Minimum distance required between conductor and vegetation	xx m				

How the thresholds were chosen: Thresholds were determined from the potential for electrical arcing and the sagging of lines based on engineering studies and observations (provide an explanation or reference to the studies).

How the thresholds will be applied operationally: Plants will be treated if monitoring observations indicate they have the potential to reach the minimum distance from lines, before the next site visit (this should be explained with reference to the growth rate of the plants and predicting their distance from lines before the next scheduled site visit).

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The PMP should indicate if the threshold is based on a legal requirement or policy (e.g., legislated requirements for vegetation removal around oil and gas wells or safety orders to clear railway ballast).

Additional Sources of Information

Further information may be obtained from references 8, 11, 12 and 13 in Appendix 1.

3.1.7 Pest Treatment Options

Relevant Regulation Sections

58(2)(e) *A Pest Management Plan prepared for the purpose of section 7(1)(a) of the Act must include the following integrated pest management elements: a description of the pest treatment options including:*

- (i) a description of the pesticide and non-pesticide treatment methods of controlling pests that may be used,*
- (ii) the rationale for selecting the treatment methods described under subparagraph (i),*
- (iii) the benefits and limitations of each treatment method described in subparagraph (i), and,*
- (iv) a description of how a decision to use treatment methods will be made.*

Reason for these Requirements

The discussion of treatment methods in the PMP is to confirm that all relevant treatment options, including alternatives to pesticides, have been identified and assessed. The assessment is to include analyzing the benefits and limitations of each treatment method and developing a rationale for the selection of methods to be used. The rationale described in the PMP should show: (i) that alternatives to pesticides are to be used where practical; and (ii) that if pesticides are to be used, those pesticides and application methods were selected using risk reduction as a guiding principle. If several treatment methods could be used, readers should be able to learn how a decision to use a method will be made.

Explanations

Link between the Pest Management Plan and Operations

IPMR Section 69(1)(e) specifies that a pesticide may be used only if it is selected in the manner specified in the PMP and based on consideration of practical alternatives to pesticide use and protection of human health and the environment (see **EN 3.4.5** on selection of treatment method during operations). The treatment selection process described in the PMP must be implemented operationally to achieve this requirement.



Description of Treatment Methods that May be Used (IPMR S.58(2)(e)(i))

A logical sequence for the PMP would be to describe each treatment method that may be used, followed by its benefits and limitations and then, if it is to be used, the rationale for selecting it. Both chemical and non-chemical options should be discussed.

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The following principles should guide the identification and selection of pest treatment options:

- look for long-term solutions to pest problems;
- collect and use information about pest characteristics to find treatment methods that maximize selectivity and effectiveness;
- use treatment methods that are appropriate for the management objectives and environmental conditions;
- use alternatives to pesticides whenever practical;
- if pesticides are necessary, make an ongoing effort to improve pesticide selectivity and to use products and application methods that reduce risk to human health and the environment (e.g., using reduced-risk pesticides, lowest effective application rates, and application methods that minimize off target drift); and
- continue to scan for new pesticides and treatment technology during the life of the PMP.

The description of non-chemical methods that may be used would include consideration of all manual, mechanical, cultural, and physical control options commonly used in the industry. The following are some examples of treatment methods that are alternatives to pesticides for different industry sectors:

- **Forest vegetation management:** Cultural controls include prescribed burning, use of sheep grazing and planting genetically improved stock.
- **Noxious weed and invasive plant management:** Cultural and biological control methods include grass seeding of disturbed areas, livestock grazing and release of parasitic insect species.
- **Industrial vegetation management:** Physical techniques include landscape fabrics, use of asphalt and other paving materials. Cultural and biological control methods include seeding areas with grass and retention or planting of low-growing shrubs.

Descriptions of herbicide treatment methods must include the product names and application methods for each proposed pesticide (S.58(2)(e)(i) IPMR). To facilitate understanding of the product and research of further information, proponents should include both the active ingredient and Pest Control Product numbers. If the proponent intends on using numerous products with the same active ingredient then they may list one example and add an “and equivalent products” statement. Proponents should include products that may have a different use pattern or hold additional interest to the reader, such as formulations that have significantly greater weather hardiness. The description of application methods must specify ground or aerial treatment. The description should also include techniques that may be used and relate these to the pesticides identified.

Considerations

Rationale for the selection of pesticides, if necessary, should consider the following:

- Is there a registered reduced-risk pesticide that could be used in place of a conventional one?
- Is there a registered bioherbicide with a plant pathogen active ingredient, which could be used in place of a conventional one?
- What is the best product formulation (lowest risk, most effective) for a proposed active ingredient?

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- Does the label of a proposed pesticide allow treatment of all the target plants and the proposed treatment method?
- Are the environmental characteristics of the proposed pesticide, such as leachability, time it takes to break down and toxicity to terrestrial and aquatic organisms, suitable for the area for where it is to be used?

Considerations for the selection of herbicide application methods that could minimize release of pesticide to the environment and risk of environmental impact should include the following:

- What is the lowest possible application rate that achieves efficacy objectives?
- Can target-specific treatments be used rather than broadcast foliar applications? (e.g., what is the potential to use infrared “weed seeking” vegetation detection and treatment equipment for railway ballast weed control, cutstump vs. broadcast, etc.)
- What is the availability to incorporate the use of shrouded booms, cone applicators or other equipment that reduce the potential for drift for foliar applications?
- What nozzle sizes, pressure, spray pattern and droplet size would be optimal to reduce drift?
- For large scale programs, how can GPS and GIS technologies during application be utilized to confirm the location of areas to be treated and environmental features to be protected? and,
- What is the optimal treatment timing to maximize effectiveness and minimize impact on non-target organisms such as biological control insects?

Description of the Benefits and Limitations of Each Treatment Method and Rationale for Selection of Treatment Methods (IPMR S.58(2)(e)(ii and iii))

The benefits and limitations should refer to the relevant objectives and considerations noted above, with particular attention to protection of the environment. For example, *the benefits of girdling trees include: it is feasible on steep terrain and it has minimal impact on non-target vegetation that may be forage for wildlife. The limitations of girdling include: it is labour intensive, difficult to carry out in dense brush and the dead trees remain standing which can pose a safety hazard.*

The following are considerations that may be discussed in the rationale selection:

- ability of the specific treatment method for achieving the pest management objectives (e.g., maintaining safety standards to staff and the public on rail lines);
- expected efficacy of the method (e.g., will it meet operational requirements and objectives, will expected results be long or short term control, cost-effectiveness, importance of combining pesticide and non-pesticide methods to increase effectiveness or reduce impacts);
- benefits with regard to protection of environmental features such as bodies of water, riparian areas, species at risk or wildlife forage and habitat;
- protection of sources of drinking water for humans or livestock;
- the urgency of the required treatment based on monitoring results and observed or potential pest impact, and the consequences of not taking any action;
- how the species or types of pest limits treatment options (e.g., stem density and height of problem vegetation can limit the application equipment used for herbicide treatments);
- the location of, and accessibility to, the pest (e.g., terrain, slope, remote areas); and
- potential impact of the treatment method on adjacent property owners.

Explanatory Notes – Content of Pest Management Plans

If no alternatives to pesticides are planned, there should be a discussion in the PMP of the reasons why none could be implemented, particularly if standard industry practices are not to be used. If cost is a major reason, details to support this claim must be included.

Often there are areas with different management objectives and characteristics to be dealt with in a PMP. In such cases it will be necessary to discuss the rationale for selection of treatment methods for each area. These may be the same management areas or operating zones for which the different injury thresholds were discussed. Multiple pests covered in a PMP may each require a separate section discussing treatment method selection.

Description of How a Decision to Use Treatment Methods will be Made (IPMR

S.58(2)(e)(iv))

If several treatment methods are to be used (non-pesticide and pesticide or several pesticides) it will be necessary to describe the decision process that will be used for determining when or where they will be used operationally. The decision process can be described in a flow chart or similar diagram that incorporates the monitoring steps, treatment thresholds and environmental parameters that will be used to determine which treatment method will be used. An example of a decision process is as follows: *Immediately before treatment, the target plant distribution will be surveyed; plants greater than 10 m away from bodies of water will be treated with xx herbicide using back-pack sprayers; plants between 10 to 5 m from bodies of water will be selectively treated with glyphosate using stem injection; plants closer than 5 m to bodies of water will be treated by manual girdling.*

Additional Sources of Information

Further information on treatment methods may be obtained from references 1, 2, 3, 6, 14, 15, 16, 17, 18 and 19 in Appendix 1. Information on the Pesticide Management Regulation Agency Reduced Risk Initiative can be found at (http://www.hc-sc.gc.ca/cps-spc/pubs/pest/_pol-guide/dir2002-02/index-eng.php). This initiative uses an expedited registration process to encourage the use of reduced-risk products. The rationale for the products achieving a reduced risk categorization may be properties inherent with the product or comparisons with commonly used alternatives in the marketplace. These pesticides may be chemical or biological pesticides. Other helpful information regarding assessing risk of pesticides that can be useful in determining treatment options can be obtained on the EPA Reducing Pesticides Risk website (<http://www.epa.gov/pesticides/health/reducing.htm>).

3.1.8 Evaluating Effectiveness and Impacts of Pesticide Use

Relevant Regulation Sections

58(2)(f) *A Pest Management Plan prepared for the purpose of section 7(1)(a) of the Act must include a description of the monitoring program that will be employed for evaluating the effectiveness of the pesticide use on pest populations and the environment, including effects on organisms other than targeted pests, by comparison with the information collected under the program described in paragraph (c)[monitoring before pesticide use], which program must include a description of:*

Explanatory Notes – Content of Pest Management Plans

- (i) *the monitoring methods,*
- (ii) *the frequency of monitoring, and*
- (iii) *the data that will be collected.*

Reason for these Requirements

Evaluation of treatment results is required to assess the effectiveness of the pesticide use on the pests and to check that there was no unreasonable environmental impact. The evaluation should provide information for improving treatments to be as selective, low impact and effective as possible. Evaluations should be used to guide future decision making on similar pest problems and to provide feedback for continual improvement of the IPM program. The PMP is to include a description of the monitoring program to confirm that it has been designed and that there is a commitment to evaluate treatment effectiveness and effects on non-target organisms. The evaluation requirement supports the Ministry of Environment's shared stewardship goal as industry proponents are required to monitor their activities to ensure they are not causing unreasonable adverse effects.

Explanations

Link between the Pest Management Plan and Operations



IPMR section 69(2) specifies that a pesticide may be used only if pre-treatment and post-treatment observations of the treatment area are made to evaluate the effectiveness and impact of each pesticide use (see **EN 3.4.6** on post-treatment monitoring during operations). Information in the PMP should describe the evaluation monitoring program that will be used to achieve compliance with S.69(2). Licensees applying pesticide to more than 20 ha of private forestlands per year must also keep a record of effectiveness and impacts of pesticide use [S.35(2)(d) IPMR].



Post-treatment monitoring may take two general forms: comparison with pre-treatment monitoring data to assess efficacy and monitoring to assess environmental protection strategies proponents have employed. Direct comparison with data collected prior to treatment will facilitate evaluating efficacy (see **EN 3.1.5** on pre-treatment monitoring). This comparison should help proponents identify changes necessary in the IPM program such as threshold establishment, treatment method and pesticide selection, and application timing.

Proponents should also consider conducting additional monitoring to enable evaluation of environmental protection strategies they have implemented. Examples of this type of monitoring could be an assessment of buffer size to protect Pesticide Free Zones and pesticide selection to assess mobility off site. This post-treatment monitoring should also aid proponents in identifying issues arising from licensees working under their PMP.

IPM programs are likely to change over time as proponents are expected to strive for continual improvement. The evaluation monitoring should result in recommendations for possible improvements to future treatments or re-treatment and for more effective protection of the environment and human health.

Explanatory Notes – Content of Pest Management Plans

Monitoring Methods

This section of the PMP should clearly describe the evaluation methods used to assess treatments. This includes describing the techniques to be employed such as random plots, line transects and spray drift cards, for example. The evaluation monitoring program should be designed to determine the efficacy of treatments and to assess environmental impacts. For some programs, these methods may include initial aerial overview surveys that can identify visible issues and to identify sites for secondary ground monitoring efforts. The efficacy evaluation must include post-treatment observations that can be directly compared with pre-treatment observations used to determine treatment necessity.

Environmental protection evaluation methods may vary among sites with different management objectives or treatment prescriptions. For example, water monitoring may be employed where there are repeated treatments with a residual herbicide adjacent to fish bearing water. An example of an environmental protection strategy assessment would be a project to evaluate buffer decisions in protecting non-treatment areas. This type of evaluation activity differs from treatment efficacy assessment in that the goal is to ensure protection strategies are adequate to prevent offsite movement and unreasonable adverse effects as opposed to assessing the success of reducing pest numbers below the threshold.

Frequency of Monitoring

This section of the PMP should describe the scheduling for observations, how many will be made and why the selected timing is appropriate. The frequency of observations will depend on a number of factors such as permanence of the site and the nature of sensitive environmental features that may be present. The evaluation process should ideally include observations and recommendations by applicators at the time of treatment. For evaluation of herbicide treatment effectiveness, monitoring should include the time when herbicide damage to target and non-target plants can be most easily observed. Sufficient observations at different sites should be made to obtain an accurate assessment of all treated areas.

Data that will be Collected

This section of the PMP should describe the quantitative and qualitative data that will be collected, and how they link to the objectives for evaluating effectiveness and impacts (e.g., the efficacy data is to evaluate whether free-growing requirements for forestry crop trees has been achieved, or whether safety standards have been achieved or sight lines restored).

Post-treatment observations for each treatment area may include:

- an evaluation of the efficacy of the treatment;
- a review of whether all targets were treated;
- information about whether the application was appropriate in the circumstances (i.e., rate, method, pesticide selection, buffers, etc.);
- information about whether the targeted pest was affected by the control option chosen and if the level of control was acceptable (i.e., whether treatment objectives were met); and
- an assessment of non-target impacts and environmental protection strategies.

Explanatory Notes – Content of Pest Management Plans

Post-treatment observations should be completed when the treatments have had time to noticeably impact targets. The optimal timing will depend on the species treated, the herbicide used, the season, and industry sector. Proponents should ensure evaluation occurs as soon as possible following treatment once impacts are evident to ensure serious issues are identified and addressed prior to further treatments being conducted. The Ministry understands there may be some delay to capitalize on efficiencies with future inspection schedules. However, certain aspects of assessing environmental protection strategies may require site visits before target impacts are evident (i.e., water quality monitoring to assess buffers chosen). Proponents may also wish to have applicators record some information immediately after treatment (i.e., if some target plants were not treated and why, problems with the application equipment, observed drift outside of the treatment zones, etc.) that could help them assess any reduced efficacy or any environmental impacts that may be discovered later.

Generally the effectiveness data to be collected should be quantitative, such as number, cover, height or presence/absence of pest plants per unit area. Examples of data collection methods include:

- counting/estimating cover of pest plants before and after treatment in the same sites used for monitoring or in a representative sample of treatment locations for comparison with pre-treatment data; and
- taking photographs of sample sites before and after treatment for comparison, including written interpretation of the photos.

Sample areas should be chosen on a random basis, but sites should also be selected where there are sensitive features to be protected or efficacy concerns are suspected based on feedback, history or land use. A representative sample of treatment locations may be evaluated but should be sufficient to adequately assess efficacy and potential impacts of proposed use.

The types of data for monitoring environmental impacts could include visual impacts on non-target damage adjacent to target plants and visible effects on wildlife (e.g., disturbance) or to their habitat or forage. Data to evaluate effects on non-target organisms should include which organisms will be looked at and the nature of the observations. This will require knowledge of the organisms that need protection in relation to the treatment area, and may require habitat assessments by personnel qualified in wildlife biology. Examples of observations include:

- herbicide impact in pesticide-free zones adjacent to water-bodies;
- impacts on any selected non-target plants that are to be protected in the treatment area (e.g., selected wildlife browse species or plants collected for human use). Such observations may be made using drift cards during pesticide application and/or examination of foliage for herbicide effects; and
- evaluation of the adequacy of buffer zones used around wildlife features to be protected. These would be features or organisms noted for protection under the section of the PMP dealing with strategies to protect fish and wildlife, riparian areas and wildlife habitat from adverse effects of pesticide use (see **EN 3.1.15**).



Explanatory Notes – Content of Pest Management Plans

Pest Management Plan and licence holders conducting evaluations should develop a system to document observations, such as evaluation record forms, and ensure staff are trained to record the required information. These forms can be included in the PMP. An example of a form used for recording evaluation is provided below.

Date of Treatment: _____	Date of Post Treatment Evaluation _____		
Target Plants Treated (species or complexes): _____			
Treatment Location (attach map or diagram if needed) _____			
Total Area treated: _____			
Non-Chemical Treatments Used:	YES <input type="checkbox"/> NO <input type="checkbox"/>		
Treatment Method: _____			
Pesticide Applied:	YES <input type="checkbox"/> NO <input type="checkbox"/>		
<u>Product Name</u>	<u>Active Ingredient</u>	<u>PCP Number</u>	<u>Application Rate (L/ha)</u>
_____	_____	_____	_____
Application Method and Type of Application Equipment: _____			
EVALUATION			
Evaluation Site Location and Features (e.g., slope, aspect, soil type): _____			
Applicator Observations at Time of Treatment: (e.g., equipment problems, uniformity of treatment, drift): _____			
Post-treatment Data on Abundance of Pest Plants: (e.g., counts or estimates per unit area): _____			
Pest Control Results: (e.g., reduction in % cover/density of unwanted plants compared to pre-treatment conditions): _____			
Conclusions on Success of Treatment: _____			
Recommendations to Improve Effectiveness: _____			
Features/biota Examined for Non-target Impacts: _____			
Environmental Impacts Observed: _____			
Recommendations for Environmental Protection: _____			

Figure 2: Example of Information to be Recorded on a Treatment Evaluation Form

3.1.9 Procedures for Safely Transporting Pesticides

Relevant Regulation Sections

58(3)(a)(i) *A Pest Management Plan prepared for the purpose of section 7(1)(a) of the Act must include the following operational information: (a) a description of the methods of handling, preparing, mixing, applying and otherwise using pesticides that will be employed under the plan including a description of the following procedures (i) for safely transporting pesticides.*

Reason for these Requirements

Pest Management Plans holders must develop and use safe transport procedures that provide an acceptable degree of protection for people and the environment.

Explanations

Link between the Pest Management Plan and Operations

IPMR section 33(2) specifies that proponents transporting or authorizing transport of pesticides must ensure it is in accordance with IPMR S.65(1) and in a manner that prevents escape, discharge, unauthorized removal and contamination of items. Section 65(1) provides specific requirements on how pesticides must be stored and labeled. Information in the PMP may include details on how the proponent plans to meet these requirements.

Information on pesticide transportation may be obtained from pesticide product labels, pesticide Material Safety Data Sheets (MSDS), the Pesticide Applicator's Handbook, material from WorkSafeBC and other publications on pesticide safety procedures. It is expected that proponents review this material prior to developing transportation procedures and ensure those involved have access to the information. Proponents should also make themselves aware of the *Transport of Dangerous Goods Act* and Regulation to understand in which situations transporting pesticides is considered dangerous goods and subject to additional requirements.

Information regarding safe transport procedures that should be incorporated into a PMP include:

- minimum standards for containers used in transport (e.g., no leaking or damaged containers) and how they will be transported (e.g., upright and secured);
- describe how dry formulations and pesticides in paper or cardboard boxes are to be protected from moisture and rain during transport;
- a description of how IPMR 33(2) will be met; and
- a description of the personal protective equipment and spill clean-up kit contents adequate for the products and volume transported that will be carried in the transport vehicle (see EN 3.1.13).



A procedures checklist for safe transport of pesticides may be necessary to confirm that staff or contractors are following the procedures. This checklist could be included in the PMP if the proponent requires contractors to complete them when implementing their IPM program.

Proponents may amend their PMP at any time if they wish to adjust the information contained in their PMP. Please see EN 3.2.3 for information on amending a PMP.



Explanatory Notes – Content of Pest Management Plans



Vehicles used to hold pesticides overnight are considered to be mobile storage facilities and are also subject to storage regulations (see **EN 3.1.10**). Pesticides unsecured in a facility, trailer or vehicle are considered resting in storage and should have the necessary requirements met of any storage facility.

Additional Sources of Information

Further information on pesticide transportation may be obtained from references 1, 15, 20, and 21 in Appendix 1.

3.1.10 Procedures for Safe Storage of Pesticides

Relevant Regulation Sections:

58(3)(a)(ii) *A Pest Management Plan prepared for the purpose of section 7(1)(a) of the Act must include the following operational information: (a) a description of the methods of handling, preparing, mixing, applying and otherwise using pesticides that will be employed under the plan including (ii) procedures for safely storing pesticides.*

Reason for this Requirement

The PMP is to include information on safe storage procedures used by PMP holders that provide an acceptable degree of protection for people and the environment.

Explanations

Link between the Pest Management Plan and Operations

IPMR section 33 specifies that proponents must make the relevant fire department aware of pesticide storage. Sections 65(1) and 66(1) [IPMR] provide specific requirements on how pesticides must be stored and labeled. Information in the PMP may include details on how the proponent plans to meet these requirements. **EN 3.6.1** provides guidance on how to meet these storage requirements.



Some PMP holders will not store any pesticide and will contract this service to a Licensee. As consultation on the PMP is meant to communicate with the public on proposed use, minimum conditions that confirmation holders plan to require of licensees should be included in the PMP. The following considerations of safe storage of pesticides should be addressed in the PMP:

- How will pesticide storage areas be separated from habitation, food, utensils, lunchrooms, washrooms, cleanup facilities, offices, maintenance shops, personal protective equipment, gasoline or propane storage, animal feed or seed?
- How will the pesticide be stored to prevent surface runoff contamination from water used to fight a fire at the storage facility?
- What are the procedures for inspection of leakage, corrosion, breaks, tears or other damage to pesticide containers and how the issue will be remedied?
- How stored pesticides are to be protected from extreme hot or cold temperatures?
- Will the proponent maintain access to up-to-date MSDS sheets for each pesticide being stored?
- How an accurate and up-to-date inventory is to be maintained for all pesticides in storage?

Explanatory Notes – Content of Pest Management Plans

- What are the procedures for safely storing pesticides at field sites (e.g., ensuring spray tanks are empty at the end of the day)?

Proponents may feel it is necessary to prepare a checklist of the procedures for safe storage of pesticides, to be used by staff or contractors, to ensure the procedures are followed. If a checklist is to be used, it can be included in a PMP.

Additional Sources of Information

Further information on storing pesticides may be obtained from references 1, 15, and 20 in Appendix 1.

3.1.11 Procedures for Safely Mixing and Loading

Relevant Regulation Sections

58(3)(a)(iii) *A Pest Management Plan prepared for the purpose of section 7(1)(a) of the Act must include the following operational information: (a) a description of the methods of handling, preparing, mixing, applying and otherwise using pesticides that will be employed under the plan including (iii) procedures for safely mixing, loading and applying pesticides.*

Reason for this Requirement

The PMP is to include information on procedures for safely mixing, loading and applying pesticides to confirm that PMP holders have developed procedures that provide an acceptable degree of protection for people and the environment.

Explanations

Link between the Pest Management Plan and Operations

IPMR S.70 requires proponents to avoid contamination of water when filling containers or equipment for the purposes of loading, mixing, applying or washing. Proponents should strive to address how these requirements will be met when developing their PMP.

Safe mixing and loading considerations that should be addressed when developing the PMP include the following:

- describe how employees will be directed to review pesticide labels and Material Safety Data Sheets (MSDS) to determine the required protective clothing and other safety precautions and how this information will be made available;
- outline what emergency facilities, including washing facilities, first aid equipment and phone numbers will be available at the mixing or loading sites;
- describe the conditions that will be required for mixing pesticides (e.g., mixed in good light, with adequate ventilation, and preferably outdoors under low wind conditions and upwind to minimize airborne exposure);
- describe directions to mixers on safety considerations when pouring pesticides (e.g., below eye level, use of a closed mixing/ loading system); and
- describe the minimum distance mixing sites will be located from bodies of water to reduce risk of contamination.

Explanatory Notes – Content of Pest Management Plans

Mixing pesticides may be an especially dangerous activity because the product is concentrated.

The PMP may discuss additional procedures for safe pesticide application in other sections of the PMP, such as under the following headings (there is information in Explanatory Notes on each of these issues on the sections noted below):



- protection of watersheds and other domestic and agricultural water sources (**EN 3.1.14**);
- protecting Fish and Wildlife, Riparian Area and Wildlife habitat (**EN 3.1.15**); and
- preventing Pesticide Contamination of Food (**EN 3.1.16**).

Additional Sources of Information

Further information on mixing, loading and applying pesticides may be obtained from references 1, 11, 12 and 13 in Appendix 1.

3.1.12 Safe Disposal of Empty Pesticide Containers & Unused Pesticides

Relevant Regulation Section

58(3)(a)(iv) *A Pest Management Plan prepared for the purpose of section 7(1)(a) of the Act must include the following operational information: (a) a description of the methods of handling, preparing, mixing, applying and otherwise using pesticides that will be employed under the plan including (iv) procedures for the safe disposal of empty pesticide containers and unused pesticides.*

Reason for this Requirement

The PMP is to include information that confirms procedures for the safe disposal of empty pesticide containers and unused pesticides have been developed and are to be used.

Explanations

Legal requirements in BC for the disposal of pesticide containers, waste produced by cleaning of pesticide application equipment or by rinsing pesticide containers are specified in the Hazardous Waste Regulation (HWR) of the BC *Environmental Management Act*.

Proponents should familiarize themselves with the HWR to ensure they are proposing managing pesticide containers and unused pesticide properly in their PMP. Pesticide labels may have disposal directions and proponents should review each label prior to developing this section in their PMP.

The HWR contains details for mandatory rinsing of empty “Commercial” and “Restricted” class pesticide containers before disposal. Instructions for triple rinsing rigid containers and single rinsing paper or plastic bags are discussed. Also discussed under the HWR is mandatory rinsing directions including minimum volumes of appropriate solvent to use. The HWR describes pesticide containers and unused pesticide which are not considered hazardous waste.

Under the HWR, waste produced by cleaning pesticide application equipment or from rinsing pesticide containers is to be disposed of, if practicable, by adding it to the pesticide spray mix; or

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if this is not practicable, by applying the waste to land in the area to which it is applied ensuring that it:

- is on land to which the product contained in the waste has been applied for purposes of pest control;
- is flat ground, not a swale, and at least 200 m from surface water or any well; and
- does not consist of gravel, sand or other similarly porous material.

Examples of procedures that may be incorporated into a PMP include the following:

- rinsed containers are to be disposed of by taking them to an approved return collection facility if available (contact the pesticide dealer or Croplife Canada (www.croplife.ca) or if no return collection program is available, by taking them to an approved landfill;
- puncture or break non-recyclable containers so they cannot be reused; and
- unwanted or obsolete pesticide product is to be disposed of through a waste disposal company approved for disposal of pesticides.

Additional Sources of Information

Further information on disposal may be obtained from references 1, 15 and 22 in Appendix 1.

3.1.13 Procedures for Responding to Pesticide Spills

Relevant Regulation Section

58(3)(a)(v) *A Pest Management Plan prepared for the purpose of section 7(1)(a) of the Act must include the following operational information: (a) a description of the methods of handling, preparing, mixing, applying and otherwise using pesticides that will be employed under the plan including (v) procedures for responding to pesticide spills.*

Reason for this Requirement

The PMP is to include information that confirms procedures for responding to a pesticide spill have been developed and are to be used, to minimize risk to the environment.

Explanations

Spill Response Plans

Information on responding to pesticide spills and preparing spill response plans can be obtained by accessing the BC Environmental Emergency Management Program web site at: <http://www.env.gov.bc.ca/eemp/>. Procedures described in the PMP for responding to pesticide spills must meet the applicable regulatory requirements stipulated in the BC *Emergency Program Act*.

Under certain conditions, pesticide spills must be reported to the Provincial Emergency Program as identified in the *Environmental Management Act* Spill reporting Regulation (http://www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/46_263_90). This regulation outlines when pesticide spills are reportable and what notifications must be performed.

Explanatory Notes – Content of Pest Management Plans

The PMP should include procedures for responding to a spill including describing:

- spill kit equipment available at mixing, loading and application sites and in transport vehicles;
- procedures to stop the source of the spill, how spilled material is to be prevented from spreading (i.e., by creating a dam or ridge), and how the liquid will be absorbed (if applicable);
- how the absorbent material and contaminated soil is to be collected and how it is to be disposed of (i.e., by an approved waste management company);
- how employees and contractors are to protect themselves when responding to a pesticide spill;
- when and how spills will be reported to the BC Provincial Emergency Program; and
- where a copy of the spill response plan is to be located (i.e., at each work site).

Spill kits should include:

- personal protective equipment to be worn by responding staff, as recommended on the pesticide labels;
- absorbent material (type and volume to ensure a sufficient amount is present);
- neutralizing material such as lime, chlorine bleach or washing soda; and
- waste collection equipment and a sealed waste-receiving container.

Contents of spill kits should be adequate to manage a spill resulting in the volume and nature of pesticide possessed by the proponent.

Additional Sources of Information

Further information on responding to pesticide spills may be obtained from references 1, 15 and 23 in Appendix 1.

3.1.14 Strategies to Protect Community Watersheds and Other Domestic and Agricultural Water Sources

Relevant Regulation Sections

58(3)(b)(i) *A Pest Management Plan prepared for the purpose of section 7(1)(a) of the Act must include the following operational information: (b) a description of the environmental protection strategies and procedures that will be followed under the plan, including (i) strategies to protect community watersheds and other domestic and agricultural water sources from adverse effects of pesticide use.*

Reason for this Requirement

The PMP is to include information that confirms strategies to protect community watersheds and other domestic and agricultural water sources from adverse effects of pesticide use have been developed.

Explanatory Notes – Content of Pest Management Plans

Explanations



IPMR 71(2) specifies that in carrying out a pesticide use, precautions must be taken to ensure that domestic water sources, agricultural water sources and soil used for agricultural crop production are protected for their intended use. Section 71(3) requires at least a 30 m no-treatment zone around a water supply intake or well used for domestic or agricultural purposes, unless it can be reduced following steps specified in section 71(4) (refer to **EN 3.6.5** for information on reduction of this no-treatment zone). Information in the PMP should include how these operational requirements will be met.

The *British Columbia Drinking Water Protection Act* and Regulation contain prohibitions against contaminating drinking water. It states that a person must not “introduce anything or cause to allow anything to be introduced into a domestic water system, a drinking water source, a well recharge zone or an area adjacent to a drinking water source.” This legislation can be reviewed at the following web sites and proponents are encouraged to ensure they are familiar with the requirements relevant to treatment options:

- Act: (www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/00_01009_01); and
- Regulation (www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/10_200_2003).

Community watersheds are defined in the *Water Act* and information can be found on specific watersheds at the following web address:

http://www.env.gov.bc.ca/wsd/plan_protect_sustain/comm_watersheds/.

Where treatments are proposed near domestic water sources it is important for proponents to consult with the local Drinking Water Officer in the Ministry of Health about proposed protection strategies. Local Drinking Water Health Authority contacts may be found at http://www.health.gov.bc.ca/protect/dw_ha_contacts.html.

Water sources to be protected should be described in the PMP. It is recommended that community watershed maps be obtained to determine if proposed treatments are within a community watershed and, if so, to determine the location of water intakes. Prior to the use of pesticides near residences, the well registry (www.env.gov.bc.ca/wsd/data_searches/wells) should be consulted. Note that this database is not complete for many areas and further effort may be required to identify wells that could be affected by proposed pesticide activities. For instance, property owners and local water purveyors could be to be consulted to locate wells and water intakes. Additionally, requests for information on location of wells and water intakes in a specified area can be advertized in conjunction with the PMP consultation. The PMP should describe how the proponent will make themselves aware of wells and water sources and manage the information collected.

Some considerations of strategies for protecting domestic and agricultural water sources that should be addressed when developing a PMP include the following:

- How will pesticides be stored (timelines and standards) within a community watershed including restrictions on preventing unnecessary storage prior to their use and when they will be removed from the watershed following application?

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- How licenced water intakes within a community watershed will be protected including describing the no-treatment zone to be established and maintained upslope?
- Which treatment methods and pesticides will be used in the vicinity of intakes or wells (i.e., selective treatment methods only, using pesticides that have minimal leeching and runoff potential, only using pesticides on soils that are not porous or water saturated)?
- How will protective measures be assessed? Will monitoring be conducted to ensure proponents are not introducing pesticide into a water supply that is to be protected? What measures will be undertaken if pesticide residues or pesticide breakdown products are detected at a community watershed water intake (i.e., discontinue pesticide use, communication plan, incidence response plan)? and
- How might proponents involve Drinking Water Officers to satisfy them that all necessary measures have been implemented to preserve water quality before further use is undertaken?

3.1.15 Strategies to Protect Fish and Wildlife, Riparian Areas and Wildlife Habitat

Relevant Regulation Section

58(3)(b)(ii) *A Pest Management Plan prepared for the purpose of section 7(1)(a) of the Act must include the following operational information: a description of the environmental protection strategies and procedures that will be followed under the plan, including a description of the strategies to protect fish and wildlife, riparian areas and wildlife habitat from adverse effects of pesticide use.*

Explanations

Link between the Pest Management Plan and Operations

 IPMR S.71(2)(c) requires proponents to avoid applying pesticides over visible wildlife and domestic animals. Section 71(1) requires proponents to not apply herbicide in such a manner as to cause erosion of a stream bank or debris from entering a stream See **EN 3.6.2** for further operational guidance on how to meet these requirements. Proponents should consider if details surrounding the proposed use should be included in the PMP to demonstrate how these requirements will be met.

Proponents must ensure strategies outlined in the PMP are consistent with regional, provincial and federal requirements and provide assurance that there will be no unreasonable effect on the environment. Proposed activities in PMPs should complement higher level plans and land use strategies and objectives relevant to the proponent's activities. The zones, plans, strategies and objectives can be referenced in the PMP.

Proponents are expected to ensure they have identified fish, wildlife and plants that require protection (as well as their respective habitats) prior to proposing treatment options in their PMP. Proponents should be familiar with the BC Ministry of Environment's webpage containing information on wildlife habitat and management strategies (<http://www.env.gov.bc.ca/wld/>). As well, proponents should consult the Conservation Framework if they require aid in identifying species and ecosystems that are at risk and threatened (www.env.gov.bc.ca/conservationframework). Proponents should also be familiar with the Federal *Species at Risk Act*, the *Migratory Bird*

Explanatory Notes – Content of Pest Management Plans

Convention Act, and the *Fisheries Act* and the *BC Wildlife Act* as well as other relevant legislation when implementing an IPM program.

The Ministry of Environment has the authority to take a number of actions to ensure the maintenance and protection of environmental values. Some of these include designating or defining:

- ungulate winter ranges;
- wildlife habitat areas and features;
- species at risk and regionally important wildlife;
- fisheries sensitive watersheds; and
- wildlife management strategies.

Wildlife habitat areas are mapped and designated to minimize disturbance to species with limited habitat or rare communities. The wildlife management strategies specify forest and range practices for wildlife protection and can include restrictions on pesticide use and silviculture activities. They include protection for specified plants and animals including caribou, bighorn sheep, grizzly bear, birds, frogs and snakes.

The Ecosystems Branch of the Environmental Stewardship Division continues to work on these designations and post them on the website noted above. Proponents should review this website periodically for changes and ensure activities described in their PMPs offer adequate protection to identified species and habitats. Appendix 2 lists other applicable federal and provincial legislation, sources for best management practices, planning documents, and guidelines, and other resources and publications available to assist in fish and wildlife protection.

If a proponent developing a PMP does not have sufficient training to identify and assess threats to wildlife and habitat and provide recommendations to avoid unreasonable adverse effects, they should acquire the services of professionals with experience and training in wildlife and habitat biology. Proponents may wish to engage a qualified habitat biologist to review strategies developed within the company to ensure they have developed a responsible plan.

Pest Management Plans should describe what steps have been taken to determine if there are wildlife species or habitats that require protection and what will be done to protect them. Additionally, PMPs should describe steps taken to identify and map bodies of water and riparian areas and what protection they will be given. In some cases environmental protection strategies are based on company procedures and/or practices agreed to by government agencies – these can be referenced in the PMP (an example is the Approved Work Practices for Managing Riparian Vegetation under an agreement between BC Hydro, Fisheries and Oceans Canada and the BC Minister of Environment).

Some examples of habitat protection strategies that previously have been used in PMPs include:

- when salvage or harvesting has occurred within a Riparian Reserve Zone, manual treatments will be used to manage vegetation competing with the regenerating stand;
- treatment of areas with value to wildlife but not suitable for planting shall be avoided;
- a pesticide-free zone (of xx meters) shall be established and maintained around all wildlife trees showing active use (i.e., nesting birds, active feeding);

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- preferred foraging areas of bears (identify vegetation complex and site conditions) are to be avoided or manually treated when there are signs of active bears; and
- ground-based spot treatments are to avoid direct treatment of ungulate winter forage, unless it is in direct competition with crop trees (e.g., within an xx m radius) or posing a safety concern as listed in the PMP. Key species to avoid include *Ceanothus spp.*, Douglas maple, red osier dogwood, Saskatoon, mountain ash, *Rosa spp.*, *Salix spp.*, and *Vaccinium spp.*

Proponents may wish to establish schedules or operating zones in their PMP where habitats with varying importance to wildlife are assigned differing injury thresholds. These thresholds could balance achieving operational objectives versus the relative importance to wildlife. Proponents may wish to review **EN 3.1.6 Injury Thresholds**.



Proponents are encouraged to describe how they will confirm that application efforts are successful in achieving the objectives they identify in their PMP. For instance, they may describe how dyes and/or drift cards will be used to confirm where spray is deposited and to help protect pesticide-free zones. This discussion may relate to **EN 3.1.8 Evaluating Effectiveness and Impacts of Pesticides Use**.



Additional Sources of Information

Further information may be obtained from references in Appendix 2.

3.1.16 Strategies to Prevent Pesticide Contamination of Food Intended for Human Consumption

Relevant Regulation Section

58(3)(b)(iii) *A Pest Management Plan prepared for the purpose of section 7(1)(a) of the Act must include the following operational information: a description of the environmental protection strategies and procedures that will be followed under the plan, including a description of the strategies to prevent pesticide contamination of food intended for human consumption.*

Explanations

Link between the Pest Management Plan and Operations

IPMR S.71(2)(b) requires proponents to take precautions to ensure domestic and agricultural water sources are protected from proposed pesticide use (**EN 3.6.5**). Proponents should describe relevant precautions in their PMP that proponents will employ to ensure these sources are protected.



Depending on the treatment methods and objectives, consideration may have to be given to prevent contamination of food for human consumption that may be grown or collected within or adjacent to proposed treatment areas. Foods may include commercial agricultural crops of vegetables, berries or fruit and may also include domestic vegetable gardens and fruit trees, bee keeping areas, forage crops, beef and milk production and areas where wild berries or medicinal

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plants may be collected. Food growing/gathering areas may be identified through consultation and/or during pre-treatment inspections of proposed treatment areas.

IPMR Section 76(2)) specifies that a PMP holder undertaking railway vegetation management is not to apply pesticide to *Rubus* species of plants that are more than 3 m away from rails, signals or switch stands, from the time the flowers open until the berries have predominantly dropped from the vines.

Considerations of strategies to prevent contamination of food intended for human consumption that should be addressed during PMP development, include the following:

- How will areas of food growing and gathering be identified? What mapping efforts will occur on operational maps and how will areas be flagged in the field prior to pesticide use?
- What inspections will occur prior to pesticide use to locate sites within or adjacent to the treatment area that are used for growing/gathering food?
- What no-treatment zones (specified distance for each treatment method and site conditions) will be maintained adjacent to food growing/gathering sites during pesticide application? What drift reduction methods will be employed?
- How will pesticide treatments be timed to minimize impacts on food plants (e.g., before the food plant is picked or after the picking season has finished)?
- How will information be posted or provided to inform the public about the treatment near food crops or in food gathering areas? What information will be included regarding precautions that should be taken (i.e., do to not pick food plants or identifying the days-to-harvest label requirement is followed if registered for use on food)?
Note: IPMR S.64 requires posted signs to include information on precautions to prevent harm to people entering the treatment area.
- How will proponents protect milk and beef production from cattle foraging on or adjacent to treatment sites?

3.1.17 Pre-Treatment Inspection Procedures for Identifying Treatment Area Boundaries

Relevant Regulation Section

58(3)(b)(iv) *A Pest Management Plan prepared for the purpose of section 7(1)(a) of the Act must include the following operational information: (b) a description of the environmental protection strategies and procedures that will be followed under the plan, including a description of the following strategies and procedures (iv) pre-treatment inspection procedures for identifying treatment area boundaries.*

Reason for this Requirement

The pre-treatment inspection of a treatment area described in a PMP is to confirm that the location of the boundary is identified so that treatment options are only applied where required based on established injury thresholds and that human health and the environment will be protected, given the proposed treatment methods and site characteristics. Proponents may wish to

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use this opportunity to confirm that the treatment areas are accurately identified in the Notice of Intent to Treat (IPMR S.42).

Background Information

Link between Pest Management Plan and Operations

Note that IPMR section 71(1)(c) requires that licensees and confirmation holders must *carry out an inspection of the treatment area to ensure that the applicable regulatory requirements and standards can be met in carrying out the use* before a pesticide is used. Section 71(1)(a) also requires that licensees and confirmation holders *ensure that each individual who will be using the pesticide is informed of (i) the boundaries of the proposed treatment area and (iii) the pesticide use procedures required to protect human health and the environment*. IPMR S.71(6) requires that proponents do not allow the release of pesticide spray or runoff to enter adjacent property without the permission of the property owner or manager. Information in the PMP should relate to these operational requirements.

IPMR S. 77(3) states that for invasive plant and noxious weed programs, licensees and confirmation holders must *make reasonable efforts to (a) identify sites where biological weed control organisms have been released, and (b) prevent harm to those organisms*.

Inspection Considerations

The required description should include details on the timing of the inspection, the procedures to be followed and what factors will be assessed to ensure the environment and human health are protected. While a contractor may be employed to conduct the pre-treatment inspections, it is the licensee or confirmation holder that is responsible for ensuring that IPMR S.71(1)(c) has been met. If documentation is required by the proponent for other purposes, the proponent may benefit from using these procedures, checklists or records in a PMP to demonstrate due diligence.

The inspection of treatment boundaries may occur immediately before treatment or following initial inspections of the management area to identify the boundary of features to be protected. Inspections performed by trained applicators at the time of treatment should ensure that proposed activities will only treat vegetation exceeding established thresholds and necessary adjustments are made regarding achieving operational objectives while affording adequate environmental and human protection. This also provides an excellent opportunity to identify and layout Pesticide Free Zones and features requiring protection.

It will be important for proponents to demonstrate that pesticide treatment boundaries are assessed, confirmed and communicated. Treatment should only include areas where vegetation is above or is expected to exceed the injury threshold based on monitoring data. The timing of pre-treatment inspection should be as close as possible to the treatment date, so that there will be minimal change in targeted vegetation or features to be protected before treatment. Proponents should also identify, if changes to the treatment area are to be made following pre-treatment inspections, how this information will be recorded.

The description of the inspection procedures should include what features will be identified to protect human health and the environment such as the location of wells, property boundaries, bodies of water, wetlands and areas set aside for wildlife. See the **EN 3.6.8** (IPMR S.71) for



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more examples of features that should be looked for to protect them from adverse impacts. The description should indicate the minimum knowledge or qualification standards to determine the treatment boundaries if there are requirements to identify critical wildlife protection issues. This may take the form of internal training or required certificates or tickets that the proponent demands of employees and contractors working under their PMP.

It will also be important to describe whether results from the inspection may involve adjusting the treatment boundary (including the width of no-treatment zones) to protect features, if required, the updating of operational maps relating to such adjustments, and how applicators will be informed of the boundaries. Identifying how applicators will be informed of the results is especially important where third parties are retained to perform applications who have not been involved in the development of the PMP and inspection of the treatment site.

Different industry sectors may have varying systems in which pre-treatment inspections are scheduled such as:

- within the forestry sector, initial inspections are often conducted to identify and map features that require protection. The identification of treatment boundaries will generally require a final inspection of the density of competing vegetation and crop tree response within the management area, to determine which areas require treatment;
- for many noxious weed management programs, potential treatment sites are based on conducting annual inspections in established management areas and responding to calls within a “seek and destroy” system. Specific treatment area boundaries and features to be protected can be identified immediately prior to treatment; and
- industrial vegetation management programs on facility sites or rights-of-way may commence with an initial inspection to identify features that must be protected which may be consistent over the duration of the PMP. The boundary of some pesticide-free zones could be permanently marked (such as with stakes or posts). Treatment area boundaries for each year’s operations may be determined by inspections of target vegetation, just prior to treatment.

3.1.18 Procedures for Maintaining & Calibrating Pesticide Application Equipment

Relevant Regulation Section

58(3)(b)(v) *A Pest Management Plan prepared for the purpose of section 7(1)(a) of the Act must include the following operational information: (b) a description of the environmental protection strategies and procedures that will be followed under the plan, including a description of the following strategies and procedures: (v) procedures for maintaining and calibrating pesticide application equipment.*

Reason for this Requirement

The description of maintenance and calibration procedures must identify how the proponents are to minimize risk of harm to applicators and the environment from faulty equipment and to ensure application rates are consistent with label directions.

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Background Information

Link between Pest Management Plan and Operations

Note that IPMR section 71(1)(b) specifies that before pesticide use, a person must ensure that the application equipment is in good working order and if required, is calibrated to conform with the application rates on the pesticide label. Section 35(3) also requires a record to be kept that shows when the equipment was calibrated and the data upon which the calibration was based.

Information in the PMP should describe how these maintenance, calibration and record keeping requirements will be achieved.

Maintenance and Calibration Considerations

The description of procedures should include a list of each type of application equipment proposed for use with the general maintenance and calibration requirements, a schedule for each one and records to be kept (as outlined in IPMR S.35(3)). Proponents should identify types of equipment (backpack sprayer, quad-mounted boom, etc.) to be used if they maintain such equipment or if they require specific equipment to be used by contractors. Confirmation holders employing contractors should indicate how it will be ensured that contractors are using equipment in proper working order and applying pesticides correctly.

Consideration of procedures for maintaining and calibrating pesticide application equipment that may be incorporated into the PMP, include the following:

- When are hoses, valves, pumps and connections to be checked (i.e., at the beginning of each season, at weekly intervals during the spray season)?
- When will sprayers be calibrated (i.e., for new equipment, when nozzles or pumps are changed, when changing application rates and otherwise after xx hours of use)?
- When will spray droplet size and the spray pattern be assessed? and,
- What records will be maintained on the maintenance and calibration performed on each applicator unit?



See **EN 3.6.7** regarding the need to ensure equipment is maintained and calibrated before pesticide is used and for an example of a record keeping form.

Additional Sources of Information

Further information on strategies and procedures for maintaining and calibrating pesticide application equipment may be obtained from references 1, 2, 16, 19, 24 and 25 in Appendix 1.

3.1.19 Monitoring Prevailing Weather Conditions and Modifying Application Methods in Response to Changes

Relevant Regulation Section

58(3)(b)(vi) *A Pest Management Plan prepared for the purpose of section 7(1)(a) of the Act must include the following operational information: a description of the environmental protection strategies and procedures that will be followed under the plan, including a description of the procedures for monitoring weather conditions and strategies for modifying pesticide application methods for different weather conditions.*

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Reason for this Requirement

The PMP is to include a description outline showing how weather conditions will be monitored and strategies for modifying pesticide application methods for different weather conditions. Modification of pesticide application methods is to occur where weather conditions may result in off-target movement of pesticide or reduce its effectiveness.

Explanations

Weather conditions that can be important for pesticide application include wind, precipitation temperature and humidity. Proponents are to include a description of the weather conditions that will be measured, when those measurements will be taken, measuring equipment to be used, and how application methods will be modified in response to weather changes. They are to ensure that applicators are trained to record weather conditions for each treatment location and day of pesticide use.

Weather conditions at the time of treatment need to be measured and recorded to ensure that applicators are assessing the weather conditions to minimize off target spray drift or runoff, to meet pesticide label requirements and to be used if necessary in evaluating treatment effectiveness or impacts that may be related to weather. Minimizing off-target pesticide movement can be critical in the protection of people, water intakes and wells, bodies of water and riparian areas and avoiding reduced efficiency of the pesticide. Modifications to pesticide application methods due to weather changes include stopping a treatment, increasing the size of no-treatment zones, directing sprays away from treatment boundaries, changing from broadcast sprays to selective treatment or using shrouds over nozzles.

Note that the IPMR has several weather related requirements including the following:

-  section 71(7) specifies that a person must not engage in broadcast spraying or foliar spraying outdoors if the wind speed exceeds 8 km an hour (except on railways). The PMP should describe how the wind speed requirement will be achieved. See the **EN 3.6.6** for more information on wind speed;
-  section 71(9)(a) specifies that a person must not use a residual pesticide on water saturated soil, during heavy rainfall or if heavy rainfall is imminent (**EN 3.6.11**);
- section 71(9)(b) specifies that a person must not spray a pesticide on foliage covered by ice or frost or if water is flowing on the foliage; and
-  section 37(1)(e) requires the confirmation holder keeping records on temperature, precipitation and wind for each treatment location and day of use (**EN 3.7.1**). **Note:** the licensee must also keep a record of the pesticide use as per IPMR S.35.

Use of portable instruments including an anemometer to measure wind and a thermometer to measure temperature is expected. When necessary, given the label directions or site conditions, use a sling psychrometer to measure relative humidity. Measurement of weather conditions should occur at or near the treatment site, ideally at the point of pesticide release from application equipment. Use of data from distant monitoring stations is not adequate.

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To monitor and measure weather conditions, it is expected that proponents:

- measure before treatment commences at each treatment site;
- re-measure during the day if changes in weather occur; and
- note the presence or absence of precipitation and its relative intensity in qualitative terms (e.g., heavy rain, light drizzle, etc.).

Proponents should design and conduct weather monitoring activities to ensure the preservation of Pesticide Free Zones and that there are no instances of chemical trespass. Two excellent sources of information proponents should review are the PMRA Agricultural Buffer Zones Strategy Proposal (www.hc-sc.gc.ca/cps-spc/alt_formats/pacrb-dgapcr/pdf/pest/part/consultations/pro/pro2005-06-eng.pdf) and the BC Environment Air Monitoring Site Selection and Exposure Criteria publication.

Additional Sources of Information

Further information on the importance of weather conditions may be obtained from references 1, 19, and 25 in Appendix 1.

3.1.20 Description of Pesticides, Application Methods and Equipment that will be Used

Relevant Regulation Section

58(3)(c) *A Pest Management Plan prepared for the purpose of section 7(1)(a) of the Act must include the following operational information: 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.*

Reason for this Requirement

The PMP is to identify each pesticide, its application method and the application equipment to be used, so that a concerned person can look up information on the pesticide characteristics and how they are to be applied to consider whether the proposed treatments will impact their interests.

Explanations

The identifying information for each pesticide should include its trade name as registered under the federal *Pest Control Products Act*. To promote understanding of proposed products and facilitate access to information for interested members of the public, proponents should include the active ingredient and Canadian *Pest Control Products Act* registration number of each proposed product for use.

The registration number is a unique identifier for each product which allows an individual to retrieve the most current label information through the Health Canada Web Site for label searches (**reference 17 in Appendix 1**). This number is also useful for seeking technical information from the manufacturer and/or Health Canada through the National Pesticides Call-line (**reference 18 in Appendix 1**). A proponent should carefully monitor the registration status of products since only registered products can be used within a PMP.

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If a program uses several products with the same active ingredient, proponents can include a list of the proposed products or provide the one they intend to use most and include a statement that similar products from different manufacturers may be used over the course of the PMP duration. If different formulations (i.e., 2,4-D ester and amine) of the active ingredient are intended to be used, these are to be listed in the PMP. Proponents may update the list of trade names in the PMP without amending their PUN and without additional consultation as long as the active ingredients listed remains the same.

Information on application methods should inform readers whether a pesticide is to be applied by methods such as broadcast foliar spray, broadcast soil spray, selective plant foliar spray, selective plant wipe-on treatment, stem spray, stem injection, cut stem spray or cut stem wipe-on etc. Information on application equipment for each pesticide should indicate whether it is to be applied by fixed-wing or rotary aerial equipment or by ground equipment such as boom sprayer, truck mounted boomless nozzle sprayer, hose and nozzle sprayer or back pack sprayer.



The rationale for selecting the pesticides and application methods to be used should be discussed under Treatment Options in the IPM section of the PMP (**EN 3.1.7 Treatment Options**). The pesticides and application methods to be used should also be consistent with environmental protection strategies described in the PMP. It should be clear how these techniques will be used in the program and what criteria will determine the operational selection.



All pesticides and methods likely to be used must be listed in the PMP. If an additional pesticide or method is to be used, the plan is to be amended before its use so that an interested person can obtain a copy of the plan at any time during its term to determine what is currently proposed or being used. The Ministry would appreciate being notified if a PMP is to be amended. Note that if a new pesticide active ingredient is to be used, or aerial application is to be added, an amended PUN must also be sent to the Ministry of Environment. Public consultation is required and an amended confirmation letter must be received before the new pesticide active ingredient is used (IPMR S.27(2) – **EN 3.2.3 on amending a PMP**). Amendment of a PUN and additional consultation is not required if a proponent uses the same active ingredient under a different trade name. Proponents are to update the list of trade names of that active ingredient in the PMP.

Additional Sources of Information

Further information may be obtained from references 1, 2, 3, 16, 17, 18, 19, and 25 in Appendix 1.

3.2 Public Consultation Requirements

The Explanatory Notes in this section provide information on requirements for newspaper advertizing and for providing information directly to individuals who may be significantly impacted. The need for these when amending a PMP is also explained.

3.2.1 Newspaper Advertising When Developing a Pest Management Plan

Relevant Regulation Sections

61(1) *At least 45 days before submitting a pesticide use notice to the administrator, an applicant for a confirmation must publish the first of 2 notices, at least 40 square cm in size, that must be published in a 2 week period in a newspaper circulated in the communities described in paragraph (e) [the area to which the Pest Management Plan applies] and, if no newspaper is circulated in those communities, in a newspaper that is circulated nearest to them, which notices must contain all the following:*

- (a) *the heading “DEVELOPMENT OF A PEST MANAGEMENT PLAN” in block letters;*
- (b) *the reference number or other identifier unique to the proposed Pest Management Plan;*
- (c) *the applicant’s name, address and telephone number;*
- (d) *a statement that the use of pesticides is intended within the area to which the Pest Management Plan applies;*
- (e) *a description, with reference to communities, of the area to which the Pest Management Plan applies;*
- (f) *the proposed duration of the Pest Management Plan;*
- (g) *the trade name and active ingredient of the pesticides proposed to be used under the Pest Management Plan;*
- (h) *the proposed manners of applying the pesticides identified under paragraph (g);*
- (i) *a location where copies of the proposed Pest Management Plan and maps of the proposed treatment area may be examined;*
- (j) *the following paragraph:*

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

38(1) *A licensee, a permit holder and a confirmation holder who is required under this regulation to conduct consultations in relation to an application or a pesticide use must prepare and maintain the following records of those consultations: (a) a record of when and in what newspaper the notice was published or when the notice was given of the public consultation, as applicable; (b) a summary of the verbal public responses to the public consultation; (c) a summary of the responses given by the licensee, permit holder or confirmation holder to the public responses described in paragraph (b).*

(2) In addition to the records under subsection (1), a licensee, a permit holder and a confirmation holder must also retain (a) copies of any notices published or given under section 60, 61 or 62, and (b) all written responses to the notice under subsection (1).

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(3) If a person described in subsection (1) conducting public consultations described in subsection (1) agrees to give notice to an individual before a pesticide use, the licensee, permit holder or confirmation holder must retain a copy of the notice given.

Reason for these Requirements

Advertising in newspapers is to communicate the development of a PMP to a wide audience in the general vicinity of the proposed treatment area. Readers can then comment on the plan regarding concerns or possible impacts that should be considered by the proponent. It also facilitates information collection by the proponent such as location of wells not listed in the provincial database. Consultation between the proponent and a person with concerns may then be conducted to determine if or how a plan should be modified to avoid impacts.

Explanations

Note that IPMR S.38 requires that records be kept of the newspapers in which advertisements were placed, a summary of responses from the public and a summary of responses from the proponent regarding the public responses. Proponents must also retain copies of the published notice and of all written comments received in relation to the notice. The Pesticide Use Notice (PUN) for registering a PMP with the Ministry of Environment asks for a summary of actions to be taken as a result of consultation (responses). This summary should outline the name of those involved, the date and time of all communications with interested parties, the method of communication and the nature of the message delivered.

The newspaper advertisement may elicit responses from people with concerns or issues that need to be addressed, especially regarding the location of domestic water intakes or wells, active public use areas and areas with sensitive wildlife features. The description, with reference to communities, of the area (including regional and forest districts) to which the PMP applies is to provide readers with an indication of whether treatments could occur in areas that they may be concerned about and whether they should ask to view the PMP. The description should refer to geographic features that are commonly known. Descriptors, such as “treatments are to be made only within fenced compounds, restricted to pipelines, rights-of-way, or highway easements”, or “areas distant from residences”, may be added to clarify how treatments may be localized or restricted so as to avoid potentially impacting interested parties. Proponents should describe the area using language that the public understands. Some proponents have chosen to include a map in the advertisement that shows the location in relation to major geographic features if the area is difficult to describe.

It is recommended that, where possible, the PMP is placed on a web site that concerned people can be directed to, either in the advertisement or when there is a request to examine the PMP. While making a web-based version available is recommended, a physical copy must be available for viewing by the public. To accommodate people who do not use a computer or would have difficulty attending a physical address to view a paper copy, it is suggested that a phone number be provided so that people can request a copy of the PMP be mailed to them. As per IPMR S.30, a confirmation holder may charge \$0.25 for each page for a copy of the PMP.

When a person raises concerns, the proponent may need to contact the sender and engage in discussions where appropriate to ensure the nature of the concerns are understood and to

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consider how they can be addressed. Proponents should consider amending the PMP to prevent impacts, in response to comments and valid concerns.

Sources of Information on Newspaper Circulation

Applicants should take steps to identify which newspapers have the widest circulation in communities within and adjacent to the area where pest treatments are to occur. Based on the number of communities encompassed by the PMP, proponents should ensure that the range of advertisements published in local newspapers best serves these communities or use a combination of the *Vancouver Sun* or *Vancouver Province* (or both) plus selected local newspapers. Please note that the Sun and or Province may not provide adequate coverage in some locations. It is expected that proponents assess options for publication and ensure adequate coverage will be achieved by confirming the publication source is relevant in the area they are advertising by comparing relative circulation numbers.

The following web site gives a complete listing of about 130 newspapers (with contact information) that have circulation in British Columbia. Applicants are advised to contact the newspapers published within the communities or people knowledgeable about circulation numbers and areas covered to best select those that fit the PMP boundaries:

<http://listingsbc.ca/Media/Newspapers/Complete.asp>

In addition, the British Columbia and Yukon Community Newspaper Association has available, at a cost of \$100 + GST, a database of 121 newspapers with circulation in British Columbia. This database includes circulation numbers, communities served, and contact information for advertising. Newspapers include ones that have both paid and unpaid circulation. Further information on obtaining this database can be obtained from the following web site:

<http://www.bccommunitynews.com/files/buydatabase.html>

Community newspapers with unpaid circulation may be used as an alternative provided they have comparable circulation to that of newspapers with paid circulation. If no major newspaper exists in a particular community where the treatment is to take place, advertisements can be placed in adjacent community newspapers. Giving preference to major local newspapers with the largest circulation is generally better than small circulation newspapers or newsletters.

The newspaper ad must be published twice in a two-week period (14 days) in the same newspaper. There should be a reasonable space of time between the two appearances, such as one week.

Please note that the advertisement must be laid out exactly as required by section 61(1), especially subsections (a) and (j). Deviation from these requirements may result in confirmation being withheld until consultation is conducted as per the IPMR. Proponents may confirm with IPM Program staff prior to publication that their draft advertisement will meet the requirements.

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Template for a Newspaper Advertisement

The following template is an example of how a newspaper advertisement can be structured. The minimum size of the advertisement must be 40 cm².

<p style="text-align: center;">DEVELOPMENT OF A PEST MANAGEMENT PLAN</p> <p>Pest Management Plan Reference Number: <u>[Applicant's unique identifier]</u>¹</p> <p>Applicant: <u>[generally the company name]</u></p> <p>Contact: <u>[Name, Address and Telephone Number of contact for information about the PMP]</u></p> <p>Notice is given that a draft Pest Management Plan has been prepared by the applicant to <u>[purpose of the proposed PMP - e.g., to control a specified pest species or complex]</u> using the principles of integrated pest management.</p> <p>The use of pesticides is intended within the area to which the pest management plan applies. Other methods are to include <u>[it may be desirable to identify non-chemical that may be used under the PMP].</u></p> <p>The pesticides and application methods proposed for use under this plan include:² <u>[list each product trade name and its active ingredient(s); e.g., Roundup containing glyphosate]</u> to be applied using <u>[list each application method that may be used; e.g., backpack, granular spreader, power hose and nozzle].</u></p> <p>The pest management activities are to be carried out <u>[describe the location with reference to communities and/or other major geographic features to the extent possible; include a map if necessary].</u><u>[describe the area to be treated e.g., right-of-way, substations, etc.]</u></p> <p>The proposed duration of the Pest Management Plan is from <u>[proposed earliest treatment date and 60 months hence; duration not to exceed 5 years].</u></p> <p>A draft copy of the Pest Management Plan document with maps of the proposed treatment areas may be examined at the following address <u>[listed above or other].</u></p> <p>A person wishing to contribute information about a proposed treatment site, relevant to the development of the pest management plan, may send copies of the information to the applicant at the address above within 30 days of the publication of this notice.</p>

Figure 3: Template for a newspaper advertisement regarding the development of a Pest Management Plan.

¹ This reference number is chosen by the applicant for use on the advertisement, so a responder can relate their concerns to the relevant PMP. **NOTE: this number must be included on the PUN.**

² It is recommended that applicants be comprehensive in listing the proposed application method(s) for each pesticide. These must correspond with those listed in the PMP.

3.2.2 Consulting Individuals Who May be Significantly Impacted

Relevant Regulation Sections

A. Consulting Individuals For Development of Pest Management Plans

61(2) *If a proposed pesticide use under a Pest Management Plan has the potential to significantly impact an individual or member of an organization or community, the confirmation holder must make reasonable efforts, starting at least 45 days before submitting a pesticide use notice to the administrator, to contact and consult these individuals.*

B. Consultation of Neighbours For Private Forest Land Licence Holders Treating More than 20 ha/year

62 (1) *A licence holder using a pesticide on more than 20 ha/year of private forest land must consult by...at least 14 days before the pesticide use, the licensee must give written notice to the owner of any property within 150 m of the treatment area.*

62(2) *A notice for the purposes of subsection (1) must contain all the following:*

- (a) description of the treatment area;*
- (b) reason for the pesticide use;*
- (c) pesticide to be used, its registration number under the federal Act and its active ingredients;*
- (d) the earliest date that the pesticide will be used;*
- (e) the width of the no-treatment zone that will be maintained from a water supply intake or well used for domestic or agricultural purposes, including water for livestock or for irrigation of crops;*
- (f) a request that the recipient
 - (i) supply the licensee with the location of water supply intakes or wells described in paragraph (e), and*
 - (ii) advise the licensee of other land uses that may be adversely affected by the use;**
- (g) a phone number at which the licensee or an employee can be reached for more information about the proposed pesticide use.*

Reason for these Requirements

The requirement to consult with individuals or organizations who may be significantly impacted is to ensure that a proponent makes a reasonable effort to identify and contact individuals who may be impacted, provide them with information, hear comments or concerns and determine if or how the PMP should be modified to avoid impacts.

There is a requirement for private forest land managers treating more than 20 ha/year to consult with property owners within 150 m of proposed treatment areas. This requirement is to promote the acquisition of information by private forest land managers so they can tailor their treatment program to avoid impact on neighbours.

Explanatory Notes – Public Consultation Requirements

Explanations

A. Consulting Individuals For Development of Pest Management Plans

The process for contacting and consulting with significantly impacted individuals or organizations may include some or all of the following:

- provide access to a copy of the draft PMP for comment (i.e., by posting it on the Web or having a paper copy available in the office);
- provide the information required in the newspaper advertisement (above). Include in the communication requests for any specific information that is required (such as the location of water intakes or wells, or confirmation of the location of property lines);
- provide opportunity for individuals to comment about the proposed pesticide use;
- when a person raises concerns, engage in discussions where appropriate to ensure the nature of the concerns are understood and to determine how they can be addressed. Face-to-face meetings or formal presentations may be required;
- determine who will require notification prior to pesticide use (e.g., bee keepers may want notification so they can move bee hives from a proposed treatment area); and
- gather comments through written or telephone correspondence, meetings or formal presentations.

‘Significantly impacted’ includes having an impact on a person’s property, livelihood, food or water source, or an organization’s recreational pursuits. The following are examples of individuals or organizations who may be significantly impacted if their activities or facilities are within or adjacent to a proposed vegetation treatment area:

- water purveyors who manage community supplies;
- registered guide outfitters;
- licenced trap line holders;
- holders of a grazing right;
- back-country and bicycle tour operators;
- biocontrol program managers (IPMR S.77(3) – noxious weed and invasive plant programs);
- owners of wells and licenced water intakes;
- organizers of established camps;
- organizations responsible for demonstration or community forest sites; and
- organizations responsible for wildlife viewing areas.

Please note that according to IPMR S.28(2), proponents have an obligation to notify individuals if they agreed to do so during the PMP consultation. This generally entails providing the relevant details of an NIT to the interested party on an annual basis.

Explanatory Notes – Public Consultation Requirements

The Ministry of Environment has requested that First Nations be contacted and consulted when a proposed pest management activity is to be conducted in an area where a First Nation asserts aboriginal interest or has treaty rights. First Nation consultation guidelines were issued by the Ministry for proponents to follow and are posted on the Ministry web site (www.env.gov.bc.ca/epd/ipmp/first_nations_cons_guide/pdf/complete_guide.pdf). Details on information sharing activities with First Nations and verification of bands with interests or treaty rights in the proposed area can be obtained from IPM Program offices in Surrey, Prince George or Penticton. In addition, the CAD Public Map Service on the Ministry of Environment's website (<http://www.env.gov.bc.ca/epd/ipmp/publications/index.htm>) can be used directly by proponents. Supporting documentation on accessing this information is also included.

The IPMR includes requirements to protect water intakes and wells and to protect human exposure to a pesticide (IPMR S.71(2)(b)). This obligates the proponent to contact individuals as may be necessary to identify the location of water intakes and wells and people who may be using the treatment area when a pesticide is used.

Note that IPMR section 38 requires that records be kept regarding when notices were given (communication occurred) to individuals being consulted, a summary of responses to the notices and a summary of the proponent's responses to the public responses. Also, the application form for registering a PMP with the Ministry of Environment requires a summary of actions to be taken as a result of consultation and a summary of any First Nations consultation.

B. Consulting Neighbours For Private Forest Land Licence Holders Treating More than 20 ha/year

Private forest land managers treating more than 20 ha/year are required to consult with property owners within 150 m of proposed treatment areas. The consultation must start at least 14 days before the proposed treatment by providing a notice with specified information about the treatment and requesting information about water use or land use that may be impacted. Ideally the notice should be provided earlier if possible to allow sufficient time for a neighbouring property owner to respond and if concerns are raised, to work out an acceptable way of dealing with the concerns. The private forest land owner should adjust proposed treatment plans if necessary to ensure there is no unreasonable impact on the neighbouring property.

3.2.3 Notification and Consultation Requirements for Amending a Pest Management Plan

Relevant Regulation Sections

27(2) A holder of a confirmation must conduct public consultations in accordance with section 61 before submitting an amendment to the pesticide use notice if the amendment relates to information required under Section 59(1)(c), (d) or (e) [pesticide use notice requirement].

59(1) Details the required information to be included in a pesticide use notice.

Explanatory Notes – Public Consultation Requirements

59(2) *If, after the applicant has submitted a pesticide use notice, the information required under subsection 59(1) changes, the applicant must submit to the administrator an amended pesticide use notice containing the amended information.*

58(4) *If a confirmation holder submits under section 59(2) an amendment to a pesticide use notice, the confirmation holder must amend the Pest Management Plan prepared in relation to the pesticide use notice so that it is consistent with the amended pesticide use notice.*

Reason for these Requirements

If significant information in a finalized PMP needs to be changed or added to, concerned individuals or organizations and the Ministry are to be informed so that the potential impacts of the changes can be assessed, and public consultation conducted if the changes may impact individuals or organizations.

Explanations

Amending a Pest Management Plan

A PMP is considered finalized after the required consultation is conducted, a Pesticide Use Notice (PUN) with required information is submitted to the Ministry of Environment and the Ministry has issued to the proponent a Confirmation of receipt of the PUN. The PMP should be as comprehensive as possible to deal with the range of possible pests and issues. However, the Ministry understands that over the life of the PMP, the proponent may wish to adjust their IPM program and amend their PMP. In fact, this is expected considering the principle of continuous evaluation and improvement. If the PMP must be amended, some amendments will require submitting an amended PUN to the Ministry and receiving a new Confirmation. In some cases (noted below), additional public consultation will be required prior to submitting an amended PUN. **Proponents should maintain a version number or date of last revision clearly in their PMP so readers may identify if they are referencing the most recent copy.**

Amending a PMP may include, for example, changing details of the IPM program, modifying the procedures for protecting people and the environment, and updating referenced documents and forms. Minor amendments are those that do not require amending a PUN or conducting additional consultation. Examples of these would include:

- adjusting a threshold for treatment following evaluation;
- including a new ground-based application method;
- increasing the size of a buffer to protect a Pesticide Free Zone; and
- updating a checklist or form the confirmation holder requires licensees to complete.

These types of minor amendments can be conducted anytime by proponents during the life of their PMP. Proponents are encouraged to update their PMP when they modify referenced documents, forms, or checklists included in the plan. While no formal notification is required for these types of changes, the Ministry appreciates being notified when a proponent amends their PMP.

Amending a Pesticide Use Notice

Major amendments include those that require the PUN to be modified. If any of the information in the PUN changes, then an amended PUN must be submitted to the Ministry (IPMR S.59(2)).

Explanatory Notes – Public Consultation Requirements

Information required in the PUN is specified in IPMR S.59(1). The PUN form on our website (<http://www.env.gov.bc.ca/epd/ipmp/forms/pdf/pun.pdf>) should be used, clearly showing what has been amended. An accompanying letter could outline the changes that have been made. The PMP must be updated to conform to the information on the amended PUN.

If any of the following information on the PUN is to be changed, public consultation will be required as per IPMR S.61 before an amended PUN is submitted to the Ministry (IPMR S.27(2)):

- using a different class of pesticide (i.e., Domestic, Commercial, Restricted);
- changing the prescribed use under IPMR S.24(2);
- adding a new pesticide active ingredient; and
- increasing the geographic boundary of the area to which the PMP applies (i.e., adding new pesticide treatment areas outside of the original boundaries described in the PUN).



The consultation to be conducted is outlined in **EN 3.2.1** (IPMR S.61) including advertising in newspapers (appropriate for the area that the changes are to occur) and consulting with individuals and organizations that may be significantly impacted. Consultation for amendments should include sending a notice of the amendments with an invitation for comment to individuals who raised concerns during the initial public consultation.

APPENDIX 1: LIST OF ADDITIONAL RESOURCES AND REFERENCES

1. Adams, R.W. *Handbook for Pesticide Applicators and Dispensers*. 2005. BC Ministry of Environment (an update is in preparation). To obtain a copy see pesticide certification study materials order form at following web site:
http://www.env.gov.bc.ca/epd/ipmp/pest_certification/study_materials.htm
2. *Handbook for Pesticide Applicators and Dispensers: Forestry Supplement*. 1992. BC Ministry of Forests and Range (an update is in preparation). To obtain a copy see pesticide certification study materials order form at web site above.
3. Integrated weed management – an introductory manual. BC Ministry of Agriculture and Lands. <http://www.agf.gov.bc.ca/cropprot/weedman.htm>
4. Weeds BC. BC Ministry of Agriculture and Lands. <http://www.weedsbc.ca>
5. *Field Guide to Noxious and other Selected Weeds of BC*. BC Ministry of Agriculture and Lands. <http://www.agf.gov.bc.ca/cropprot/weedguid/weedguid.htm>
6. Weed Management Website. BC Ministry of Agriculture and Lands. <http://www.agf.gov.bc.ca/cropprot/weeds.htm>
7. The Tree Book, BC Ministry of Forests and Range.
<http://www.for.gov.bc.ca/hfd/library/documents/treebook>
8. BC Southern Interior Weed Management Committee Website.
<http://www.siwmc.ca/default.htm>
9. Stocking and Free Growing Surveys Procedure Manual – Forest Practices Branch. 2002.
<http://www.for.gov.bc.ca/hfp/publications/00099/Surveys/Silviculture%20Survey%20Procedures%20Manual-April%201%202009.pdf>
10. Range Manual, Chapter 11 – Weed Containment and Control. BC Ministry of Forests and Range. <http://www.for.gov.bc.ca/hfp/publications/00005/#chapter11>
11. Invasive Alien Plant Program, Ministry of Forests, Lands and Natural Resource Operations. http://www.for.gov.bc.ca/hfp/invasive/IAP_01.htm
12. Summary Report on Invasive Plant Management in British Columbia 2004/05 and 2005/06. BC Ministry of Agriculture and Lands.
http://www.agf.gov.bc.ca/cropprot/invasive_plants_report.pdf
13. Invasive Species Council of B.C. Publications and newsletters.
<http://www.bcinvases.ca/>
14. Powell, G.W. et al. 1994. *Field Guide to the Biological Control of Weeds in BC*. BC Ministry of Forests.

Appendix I. List of Additional Resources and References

15. Pesticide Wise Web-site. BC Ministry of Agriculture.
<http://www.agf.gov.bc.ca/pesticides/>
16. *Herbicide Field Handbook*. J.O. Boateng, March 1998. FRDA Handbook ISSN 0835-1929, 006 (REV). Ministry of Forests.
17. Website for pesticide label searches. Health Canada, Pest Management Regulatory Agency.
<http://www.hc-sc.gc.ca/cps-spc/pest/registrant-titulaire/tools-outils/label-etiq-eng.php>
18. The National Pesticides Call-line (operated by Health Canada) for technical information on pesticides registered in Canada. Telephone: 1-800-267-6315.
19. *Industry Standards and Good Practices for Vegetation Management*. 1992. Canadian Vegetation Management Alliance, Abbotsford, BC.
20. *Standard Practices for Pesticide Applicators*. WorkSafeBC.
http://www.worksafebc.com/publications/health_and_safety/by_topic/agriculture/default.asp
21. *Transportation of Dangerous Goods Act*. SafeCanada, *Transportation of Dangerous Goods*. http://www.safecanada.ca/link_e.asp?category=8&topic=60
22. *Environmental Management Act*, Hazardous Waste Regulation, Section 42. BC Ministry of Environment.
http://www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/03053_00
23. Environmental Emergency Management Program Resource Information for spills. BC Ministry of Environment. <http://www.env.gov.bc.ca/eemp/>
24. Pesticide Application Equipment, Sprayer Calibration Worksheets. BC Ministry of Agriculture and Lands. http://www.agf.gov.bc.ca/pesticides/f_6.htm
25. National Aerial Pesticide Application Manual. Health Canada, Pest Management Regulatory Agency (contact provincial pesticide regulatory agencies to obtain copies).
26. Listing of Regional Districts of British Columbia. 2001.
<http://www.bcstats.gov.bc.ca/data/pop/maps/rdmap.asp>

APPENDIX 2: SOURCES OF INFORMATION FOR DEVELOPING STRATEGIES FOR PROTECTING FISH AND WILDLIFE, RIPARIAN AREAS AND WILDLIFE HABITAT

Relevant Federal Legislation and Agencies

Current federal legislation can be accessed through the Department of Justice Canada.

<http://laws.justice.gc.ca/en/index.html>

Fisheries Act establishes criteria for the protection of fisheries and fish habitat from pesticides.

Food and Drugs Act describes restrictions on pesticide use on livestock forage, and where livestock will be consumed by humans.

Migratory Birds Convention Act describes the requirements to protect migratory birds from pesticides.

Pest Control Products Act and Regulations regulates the registration, labeling and handling of pest control products that are sold and used in Canada.

Pest Management Regulatory Agency (PMRA), a division of Health Canada, is responsible for the regulation of pest control products in Canada. As the federal authority under the *Pest Control Products Act* (PCPA), the PMRA also develops pest management policies and guidelines, promotes sustainable pest management, enforces compliance with the PCPA and distributes pest management information to the general public and key stakeholders. It has an electronic label search available through the following web site:

<http://www.hc-sc.gc.ca/ahc-asc/branch-dirgen/pmra-arla/index-eng.php>

Species at Risk Act protects endangered or threatened wildlife species from activities including pesticide use. Its purpose is to prevent wildlife species from being extirpated or becoming extinct, to provide for the recovery of wildlife species that are extirpated, endangered or threatened as a result of human activity and to manage species of special concern to prevent them from becoming endangered or threatened.

<http://laws.justice.gc.ca/en/S-15.3/index.html>

Provincial Legislation

Fish Protection Act – protects fish and fish habitat by limiting licences in water short regions and providing directives for residential, commercial and industrial development.

Wildlife Act establishes criteria for the protection of wildlife and wildlife habitat, regulates hunting, and declares and protects endangered species:

http://www.qp.gov.bc.ca/statreg/stat/W/96488_01.htm

Appendix II. Information on Fish and Wildlife Protection

Best Management Practices

Important Bird Areas (IBA) identified under the BirdStudiesCanada program provides information and maps of important bird habitat.

<http://www.ibacanada.ca/>

Guidelines and Best Management Practices, Ecosystem Branch, BC Ministry of Environment. At the time of preparation of these Explanatory Notes (2011), there were no guidelines or best management practices published by Ecosystem Branch regarding pesticide use, although some are in preparation. Other guidelines on their website below may contain useful information on sensitive habitat or species in various areas of the province.

<http://www.env.gov.bc.ca/wld/>

Higher Level Plans

Strategic Land and Resource Plans are published by the Integrated Land Management Bureau of the Ministry of Agriculture and Land. Some identify wildlife values and land uses that are to be protected.

<http://ilmbwww.gov.bc.ca/slrp/index.html>

Resources on Biodiversity

Biodiversity Publications Catalogue, (2001) Ecosystem Branch, BC Ministry of Environment. This document provides an annotated list of biodiversity-related reports and publications with ordering information. Publications are grouped as: Animals – General, Invertebrates, Fish, Reptiles & Amphibians, Birds, Mammals-General, Mammals-Small, Bats, Bears, Carnivores, Ungulates, Plants & Fungi-General, Fungi, Mosses, Lichens & Liverworts, Conifers Flowering Plants; Ecosystems-General, Classification & Interpretation, Aquatic & Riparian, Wildlife Trees & Logs, Stand Dynamics and Silviculture.

<http://www.env.gov.bc.ca/wld/catalogue/index.html>

Resources for Species and Ecosystems at Risk

Endangered Species and Ecosystems Web Site, BC Ministry of Environment, provides a gateway to detailed information on rare and endangered species and ecosystems in BC, helps you find national and global information about species in B.C. and beyond, and provides links to provincial agencies and other agencies working with endangered species.

<http://www.env.gov.bc.ca/atrisk/>

Conservation Data Centre Web Site, BC Ministry of Environment, provides information on species and ecosystems at risk.

<http://www.env.gov.bc.ca/cdc/>

BCME, Species and Ecosystems Explorer is a valuable provincial search mechanism that identifies known locations of species, ecological communities, Red and Blue listed species and ecological communities by Forest District and Biogeoclimatic unit. Results identify species and ecological community status, legal designation, distribution, life histories, conservation needs, recovery plans and provide direct links to relevant publications.

<http://a100.gov.bc.ca/pub/eswp/>

Appendix II. Information on Fish and Wildlife Protection

Geo BC Web Site, Integrated Land Management Bureau, Ministry of Agriculture and Lands, provides maps of locations of rare and endangered plants, animals and ecological communities. Includes detailed information for non-sensitive occurrences.

<http://www.geobc.gov.bc.ca/> (*click on Fish Wildlife and Plants*)

Resources for Fish, Fish Habitat and Riparian Areas

Biodiversity Publications Catalogue - Aquatic and Riparian Section provides an annotated list of biodiversity-related reports and publications on fish and riparian areas.

http://www.env.gov.bc.ca/wld/catalogue/aquatic_rip.html

BCME, Riparian Areas Regulation website provides links to protecting riparian fish habitat, while facilitating urban development that exhibits high standards of environmental stewardship for ensuring healthy fish populations.

http://www.env.gov.bc.ca/habitat/fish_protection_act/riparian/riparian_areas.html

Resources for Wetlands, Amphibians and Reptiles

Frog Watch Program Web Site. Ecosystem Branch, BC Ministry of Environment, provides research and reference material, regional projects and contacts, and links.

<http://www.elp.gov.bc.ca/wld/frogwatch/>

Literature Review of Impacts of Glyphosate Herbicide on Amphibians: What Risk can the Silvicultural Use of this Herbicide Pose for Amphibians in BC? 2008. Ecosystem Branch, BC Ministry of Environment Report.

<http://www.env.gov.bc.ca/main/publications.html>

Resources for Wildlife and Wildlife Habitat

Wildlife Act regulates hunting and declares and protects wildlife and endangered species

http://www.qp.gov.bc.ca/statreg/stat/W/96488_01.htm

Wildlife Web Site, Ecosystem Branch, BC Ministry of Environment, provides links to information about wildlife species inventory and wildlife habitat mapping in B.C., including data collection methods, inventory and mapping procedures, interpretations, provincial standards and data management (information systems, data capture and data warehouses).

<http://www.env.gov.bc.ca/wildlife/index.html>

Species and Habitat Management Recommendations, Washington State Department of Fish and Wildlife; identifies needs for protection of fish and wildlife based on the best available science and provides guidelines for their incorporation in management decisions.

<http://wdfw.wa.gov/hab/phsrecs.htm>

Resources for Birds

Wildlife Act regulates hunting and declares and protects wildlife and endangered species (esp. see Section 34 – Birds, nests and eggs).

http://www.qp.gov.bc.ca/statreg/stat/W/96488_01.htm

Appendix II. Information on Fish and Wildlife Protection

Biodiversity Publications Catalogue – Birds Section provides summaries of reports and publications with ordering information on birds, habitat and management.

<http://www.env.gov.bc.ca/wld/catalogue/birds.html>

Ducks Unlimited Canada describes wetland and wildlife conservation in BC.

<http://www.ducks.ca/province/bc/index.html>

Resources for Grizzly Bear Habitat

Biodiversity Publications Catalogue – Bears Section, provides summaries of reports and publications with ordering information on grizzly bears, habitat and management.

<http://www.env.gov.bc.ca/wld/catalogue/bears.html>

APPENDIX 3: THRESHOLD MATRIX EXAMPLE

Noxious Weed and Invasive Plant Categories

Category 1	Category 2	Category 3	Category 4
Plants that pose extreme risk for invasion and spread into undisturbed sites, including ecologically at risk habitats. Sites < 0.5 ha, including new infestations within containment zones of other noxious weeds or invasive plant species will be considered for control.	Plants that pose a high risk of invasion and spread to undisturbed sites. Less aggressive than Category 1 plants, but pose similar threat to ecologically at risk areas. Sites less than 0.25 ha would be considered for control.	Plants that pose a moderate risk to invasion and spread into disturbed sites. These plants pose a threat to ecologically at risk sites.	Plants that pose a low to moderate risk of invasion and spread into undisturbed sites.

Noxious Weed and Invasive Plant Site Priorities

Priority	Purpose or Intent of Treatment
1. Extremely High Risk	To stop the spread of noxious weeds or invasive plants threatening non-infested, highly susceptible areas. These sites are generally less than or equal to 0.25 ha, and are widely separated by distance or physical barrier from the infestation site. These sites have a high probability of control
2. High Risk	To stop the enlargement of sites in highly susceptible areas. These sites are \leq 0.5 ha. These sites must have a good probability of control.
3. Moderate Risk	To stop the enlargement of sites of greater than or equal to 0.5 ha. In highly susceptible areas of \leq 0.5 ha. In moderately susceptible sites. These sites must have a good probability of control.
4. Low Risk	To stop the enlargement/contain sites in moderately susceptible areas of \geq 0.5 ha. These sites must have a good probability of control.

Appendix III. Threshold Matrix Example

Treatment Rationale by Species Category and Site (Injury Thresholds)

Plant Category	Site Priority	Program Level
1 1 2	1 2 1	Initial Attack (prevent new species from becoming established)
1 2 2	2 2 3	Containment (prevent current infestations from expanding)
3 3 3	1 2 3	Full Program

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