Pest Management Plan

PMP Confirmation #: CN-19/24-BCW

2019 – 2024

Contents

1.0 INTRODUCTION

This document is a Pest Management Plan (PMP) for the management of vegetation within property owned or operated by Canadian National Railway Company (CN) in western British Columbia including all track ballast, right-of-way (RoW) and station grounds, including rail yards and all property owned or controlled by **CN** as indicated Section 1.2.

This plan has been prepared following the format as set out in Section 58 of the BC Integrated Pest Management Regulations (IPMR).

1.1 Identifying Information

CN is a leader in the North American rail industry. The **CN** regional organization structure includes three geographic regions: Western Canada (based in Edmonton), Eastern Canada (based in Toronto), and United States (based in Homewood, Illinois).

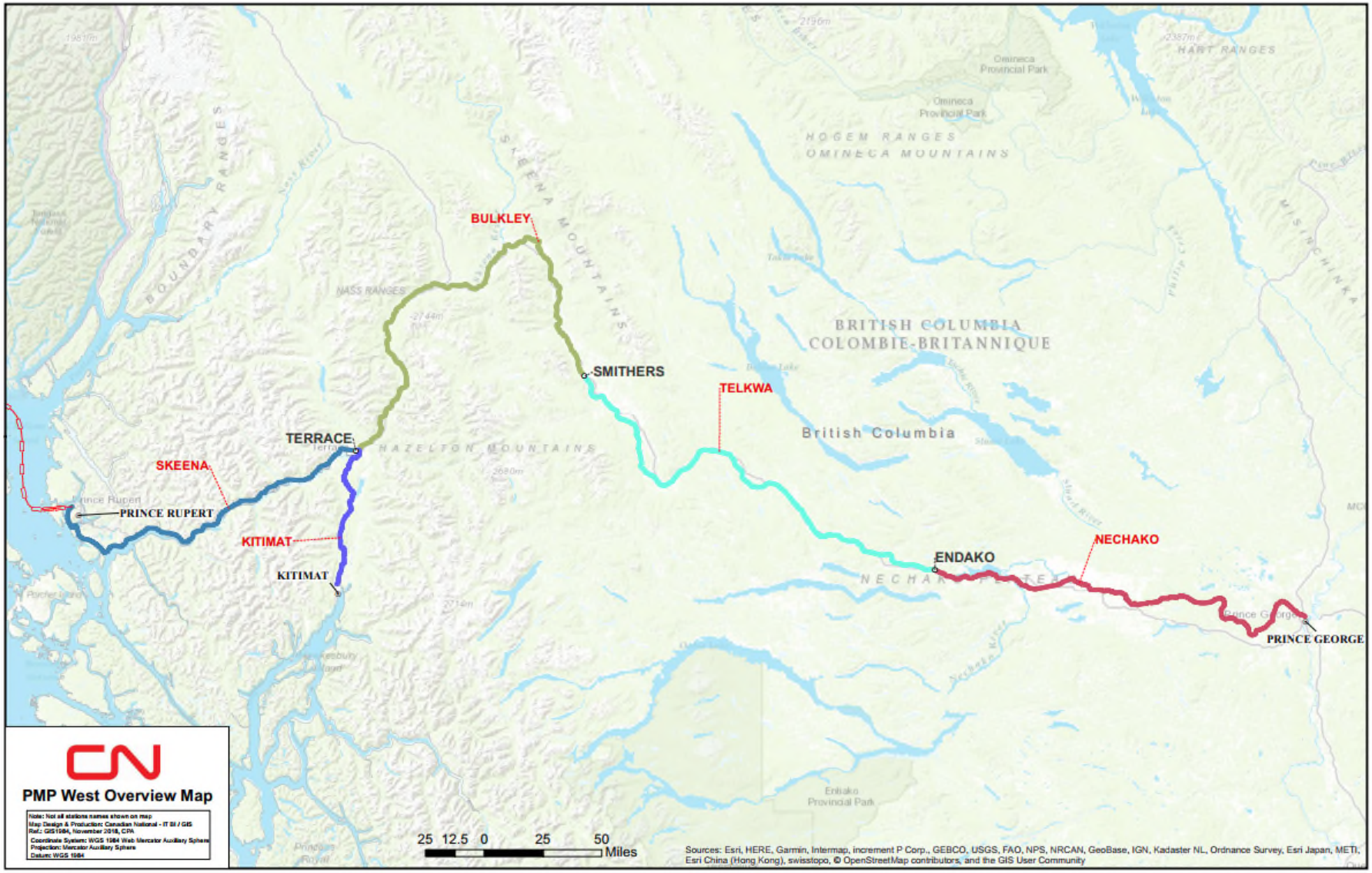
The person responsible for managing vegetation on land owned or operated by **CN** in British Columbia is Luanne Patterson, Senior System Manager – Environmental Assessment located in CN Thornton Yard, 11717-138th Street, Surrey BC V3R 6W4.

The principal contact for information relating to this plan is: CN at 1-833-582-3608, contact@cn.ca

1.2 Geographic Boundaries of the PMP

This plan covers the **CN** subdivisions from Prince Rupert to Prince George BC including: Nechako, Telkwa, Bulkley, Kitimat, and Skeena. The map below shows CN's route covered by this PMP.

This plan applies to all track ballast, right of way (RoW), station grounds, rail yards, bridges, road and pedestrian crossings, around shops, buildings, communications and signals within all property owned or operated by **CN** within the subdivisions indicated above.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BOUNDARY RANGES
HOGEM RANGES
OMINECA MOUNTAINS
HART RANGES
BRITISH COLUMBIA
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PMP West Overview Map
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Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community

1.3 Term of the PMP

This plan covers the utilization by **CN** of herbicides, within the geographic boundaries of the areas indicated in Section 1.2. This usage is required in order to meet CN's legal obligation under the federal Railway Safety Act, R.S., 1985, c. 32 (4th Supp.) (RSA) and associated legislation to manage vegetation within the railway RoW in the interest of safe railway operations. The plan shall be in force for a five year period.

2.0 PURPOSE, OBJECTIVES, REASONS

2.1 Purpose

CN is in the relatively unique situation of having a legal obligation, pursuant to the Rules Respecting Track Safety (the Rules), adopted under the RSA, to ensure that vegetation which is on or immediately adjacent to the railway roadbed is controlled. In particular, the Rules require federal railways to ensure that track is free of vegetation that could create fire hazards, affect track integrity and obstruct visibility of operations and inspections. Separate regulations also require removal of vegetation to ensure every grade crossing meets sightline requirements. Accordingly, and consistent with **CN's** robust legislative framework, vegetation management activities are performed to ensure safe and efficient railway operations across **CN's** transcontinental railway system.

As a result, the purpose for managing vegetation on lands owned or operated by **CN** is to maintain the safe functioning of train operations and to protect the public, employees and the environment from potential hazards that are associated with vegetation around railway operations. Specifically:

- Vegetation that is interfering with railway operations and/or causing safety issues;
- Ballast section vegetation;
- Noxious weeds and invasive plants;
- Vegetation that interferes with sightline requirements;
- Vegetation that affects inspection of track and bridge structures;
- Vegetation such as fungus that rots wood timbers and piles;
- Danger trees (trees, because of defects, that can fall onto tracks); and,
- Certain amounts and varieties of vegetation in railway yards, station grounds, around buildings and signal infrastructure.

If not managed properly, unwanted vegetation can:

- Damage the integrity of the roadbed;
- Inhibit the operation of signals and switches;
- Hinder the inspection of the track structure, bridge components, and trains;
- Cause trackside fires;
- Compromise employee safety when train crews entrain and detrain; and,
- Reduce visibility at public road crossings
- Prematurely rot and destabilize timber structures

2.2 Objectives

The objectives are to ensure effective vegetation management for railway safety purposes, while considering and incorporating environmental and human health values. **CN** is committed to ensuring worker and public safety and environmental protection considerations in balance with the safe and efficient operation of a railway.

The objectives of the **CN** program are to:

- Maintain a vegetation-free track ballast section;
- Maintain vegetation in railway yards, station grounds, around buildings and signal infrastructure.
- Maintain a stable, self-sustaining, RoW plant community compatible with federal railway safety requirements*;*
- Eliminate danger trees; and,
- Manage noxious weeds and invasive plants.

In meeting these objectives, **CN** will ensure the protection of the public, employees and the environment from the potential hazards associated with operating a railway by maintaining the safe and efficient functioning of train operations.

2.2.1 Vegetation Treatment Zones

As shown in Figure 1, the railway RoW is divided into two vegetation management zones: the ballast and the RoW.

Figure 1: Vegetation Management Zones

Ballast Section is comprised of the ballast and sub-ballast areas with a typical treatment width of 6.1 meters (16ft). On a railway, the ballast is the layer of crushed rock that supports the rail and ties.

Right of Way Section is the area on either side of the ballast section with a typical width of up to 50ft from track centerline on which vegetation management may be undertaken such as mechanical brush and/or herbicide application. The typical treatment width is an additional 3m (8ft) outside of the ballast section.

2.3 Reasons For Vegetation Management

2.3.1 Structural Integrity of the Roadbed (Ballast)

Ballast is the layer of crushed rock that supports the rail and ties where train dynamic forces are applied. This section of the track is critical to the railway infrastructure stability by:

- Reducing the risk for derailments;
- Providing free drainage of water;
- Providing structural support for vertical loads; and,
- Keeping the ties and rails from moving as a result of compressive and expansive train forces occurring during rail operations and temperature changes.

Total vegetation control in the ballast section is the most critical aspect of the **CN** vegetation management program. Any type of vegetation in the ballast sections leads to problems with a stable track structure, which compromises railway safety.

Track switches and turnouts and foot traffic associated with train operations, track maintenance and inspection all occur in the ballast section. The close proximity to combustion sources of track ties and dry vegetation in the ballast can result in a fire hazard.

The large width of the complete railway RoW in relation to the relative narrow width of the ballast section provides an inherent buffer to adjacent properties.

Vegetation will negatively impact the structural integrity of the railway roadbed. Vegetative growth within the track ballast reduces drainage. Proper drainage of the ballast section is critical for a stable track structure. Vegetation retains fine particles such as silt or clays and increases organic matter within the ballast, which in turn, reduces drainage of water and leads to additional growth of vegetation and decreased ballast integrity. When the ballast's ability to support the weight of trains is reduced, the result is problems with track support, alignment and profile that are common causes of train derailments. Fungus and rot associated vegetation growth within timber structures such as piles, struts, beams associated with timber bridges, retaining walls and mooring structures. Premature aging and structure deterioration affects the integrity of the roadbed and **CN** infrastructure.

Vegetation growing at the ballast shoulder can impede proper drainage and contribute to flooding or washout of the track structure and surrounding areas. Excessive moisture will also contribute to the premature deterioration of rail ties and track hardware, failure of which may result in a train derailment.

2.3.2 Safety and Inspection

The condition of the track structure and train cars is monitored at regular intervals by sophisticated electronic inspection and detection equipment. However, railway employees must also be able to visually inspect both stopped and moving trains for defects in car equipment such as wheels, bearings and couplings. It is also imperative that maintenance personnel are able to visually inspect the track roadbed and track structure such as switches, ties, rail and fasteners. The presence of vegetation can significantly impair proper inspection.

The presence of vegetation in the ballast can also interfere with the proper functioning of laser guided track alignment and automated inspection equipment devices such as power switches, crossing signals, hot box detectors, flat wheel detectors, and lateral load detectors, which rely on line-of-sight infrared scanning.

2.3.3 Hazards to the Public

There are many possible sources of ignition in railway operations including sparks from brakes, diesel engines, wheels, overheated bearings and operation of rail-grinding equipment. Sources of ignition, combined with dry brush and weeds in hot dry conditions, are a fire hazard, with potential to harm the public or damage buildings, property or the environment.

Excessive growth of brush reduces visibility at public level road crossings, which can lead to the increased risk of train collisions with public vehicles, pedestrians and potential injury to railway employees.

Tall-growing vegetation can also reduce the visibility of railway signals or signs and interfere with the operation of switches that are necessary for safe operations.

2.3.4 Hazards to Railway Employees

Vegetation growth can interfere with and be hazardous to employees conducting their everyday trackside duties. Train crews must be able to safely walk beside the track and climb on and off slow moving trains. Maintenance personnel must work around the track structure and throughout the RoW. Vegetative growth can impede movement, cause slippery conditions and create tripping hazards for employees. Excessive vegetation may also obscure tripping hazards such as equipment, uneven ground or holes.

Excessive vegetation not only interferes with employees' ability to carry out maintenance duties such as rail and tie changes but also results in the loss of tools, track hardware and other equipment which represents tripping hazards to employees.

2.3.5 Damage to Rail Equipment

The presence of vegetation exceeding the height of the rail may cause wet, slippery conditions, which can affect traction and braking of locomotives and equipment. This can result in damage to track and locomotive components. Slippery conditions require increased use of traction sand by the locomotive, which further contaminates the ballast. Excessive vegetation can also increase the potential for collisions between railway equipment and vehicular and/or pedestrian traffic at public road crossings due to the decreased braking ability.

2.3.6 Hazards to Animals

Efficient snow removal (plowing) from the tracks is impeded by vegetative growth. Deep snow banks created by brush adjacent to the track may act as a barrier to deer, moose and other animals attempting escape from moving trains. Jumping into these snow banks causes animals to break limbs or often because of unsure footing the animal will return to the track and run ahead of a train until they are killed by collision.

During the growing period, browsing animals are attracted to the brush and shrub vegetation growing within the RoW. Bears are also attracted to berries growing within the RoW. Control of brush increases the growth of grasses rather than woody species, which are less desirable for browsing animals.

2.3.7 Track Communication and Signals Systems

Radio facilities are contained in structures located at intervals throughout the railway network to provide communication links between dispatchers, trains and maintenance or other employees working within the CN system. Electrical power lines supply power to operate the radio system and track switches, heaters and signals. Propane fuel tanks supply fuel to switch heaters that prevent the icing of track switches in winter. Problems at these facilities associated with excess vegetation can include:

- Risk of grass or brush fires that may damage fuel tanks and structures;
- Reduced visibility of track signals and obstruction of track switches by vegetation and snow trapped by vegetation;
- Hazards to power lines, poles and support wires from falling trees;
- Corrosion around steel signal structures and fuel tanks from moisture associated with vegetation; and
- Reduced access to sites and structures resulting from encroaching vegetative growth.

2.4 Management of the Right of Way

Selective control of vegetation within the RoW is sometimes required to remove brush and trees. The main concerns with having brush and trees growing within the RoW include:

- Maintaining visibility (i.e. sight lines) at road and pedestrian crossings;
- Maintaining sight line visibility at curves;
- Providing clear visibility of signs and signals;
- Maintaining the integrity of railway communication and electrical distribution lines;
- Maintaining the functionality and integrity of rockfall and slide detectors
- Reducing physical hazards to train and maintenance personnel working in these areas; and,
- Reducing the fire hazard potential.

2.4.1 Sight Line Requirements

Maintaining visibility at road and pedestrian crossings is necessary to reduce the potential for accidents with vehicles and pedestrians.

Under the RSA, there are mandatory sight line regulatory requirements for road and pedestrian crossings. One requirement under this act is the degree of visibility for both vehicles crossing the tracks and for rail

based vehicles. The greater the posted road speed limit and the greater the train speed at these crossings, the greater the sight line requirements. The sight line distance is to allow both vehicles (road and rail) sufficient time to see and to stop for the approaching vehicle. **CN** is committed to maintaining these sight line requirements through its vegetation management program.

2.4.2 Noxious Weeds and Invasive Plants

CN has responsibility to control the spread of weeds designated as noxious. Movement of trains and other rail equipment, as well as the spread of these weeds through natural environmental factors such as wind or rain, make their control on railway ballast and RoW a priority.

3.0 THE CN PEST MANAGEMENT PROGRAM

In this PMP, **CN** follows integrated pest management (IPM) principals in its vegetation management program.

The elements of IPM included in **CN's** PMP are:

- **Prevention (planning)** and managing ecosystems to prevent organisms from becoming pests;
- **Identifying** vegetation to manage and potential vegetation problems;
- **Monitoring** populations of vegetation, the damage caused by vegetation, and environmental conditions;
- **Using injury (treatment) thresholds** in making treatment decisions;
- **Suppressing vegetation populations (pest treatment options and method selection)** to acceptable levels using strategies based on consideration of biological, mechanical and chemical controls in appropriate combinations (i.e., treatment options), in conjunction with environmental and human health protection; and,
- **Evaluating** the effectiveness of vegetation management strategies.

3.1 Prevention

CN undertakes proactive measures aimed at preventing the initial growth and spread of unwanted vegetation. These measures are utilized when feasible and cost effective and may include the following:

- Selective tree removal from RoW and crossings;
- Seeding of disturbed areas (competition/revegetation); and,
- Elimination of seed sources

3.1.1 Selective Tree Removal from the Right of Way and Crossings

Tree removal may be carried out:

- To remove woody vegetation and brush that is interfering with the normal functioning of equipment used to detect slides, rockfall or ground failures;
- In areas where trees pose a danger of falling onto the track; and,
- Where they are restricting sight lines at road crossings or railways signals/signs

Apart from these reasons, trees on the RoW and near crossings serve as sources of seeds or debris that can establish on the ballast or shoulder, thus necessitating control measures to be implemented.

3.1.2 Revegetation (Seeding Disturbed Areas)

Desirable vegetative cover along the RoW consists of grasses and low growth plant species. The establishment of grasses and low growing vegetation in disturbed areas prevents the establishment of noxious weeds, invasive plants and other undesirable vegetation. Some legumes, such as clover, have a low growth form. They are an excellent ground cover, remaining green through the growing season, therefore reducing fire hazard potential. This use of vegetative cover is very beneficial where the vegetation has been disturbed and mineral soil is exposed. However, it is not an effective method of control in situations where vegetation is well established.

3.1.3 Eliminating Seed Sources

Leakage of grain from improperly closed hopper gates and poor filling of hoppers causing grain to collect on the car end platforms is a seed source for vegetation on the ballast section. CN has an ongoing maintenance program to repair hopper gates and is in the process of replacing a portion of the government grain car fleet with new grain cars. These repairs and upgrades helps to further reduce the introduction of a seed source to the railway corridor.

3.2 Identification of Targeted Pests

The accurate identification of unwanted vegetation growing on CN property is important for several reasons:

- The method of control for vegetation is dependent on the recognition of the density and the specific type;
- Depending on growth rates, characteristics and location, control may not be warranted or desirable. For example, grasses growing on a site where the soil has been disturbed would be desirable;

- Control methods may differ depending on the species of plant. Some plant species may be easily controlled by non-chemical methods, while other species may be controlled through the use of certain types of herbicides; and,

There are four vegetation categories targeted by this PMP:

- Herbaceous broadleaves and grasses;
- Woody vegetation (i.e., trees and shrubs);
- Fungal and microbial growth that deteriorates wood; and,
- Noxious weeds and invasive plants.

3.2.1 Herbaceous Broadleaves and Grasses

Herbaceous broadleaves and grasses are commonly found in the RoW and ballast section. Many low-lying grasses in the RoW can be beneficial as they may prevent the establishment of noxious weeds, invasive plants and woody vegetation.

Herbaceous broadleaves and grasses are the most frequent type of vegetation growing on track ballast, within station grounds, railway yards, and around shops, buildings, signal and switching infrastructure, and material storage areas. As will be shown in Section 3.4 of this PMP, the tolerance for herbaceous broadleaves and grasses growing in these areas is very low, and often results in control measures being implemented.

3.2.2 Woody Vegetation

Woody tree and shrub species are most problematic when they encroach onto ballast or the track shoulder, or are found on the RoW where their presence limits visibility or access to switches and other equipment. They may present a safety hazard if they blow down into the tracks or disrupt the functioning of slide detectors. They can also present a fire hazard if their branches are overhanging too close to power lines located on the RoW, can compromise site security by providing easier access over security fencing, and can deposit organic debris onto the ballast which increases growth of unwanted vegetation. Woody vegetation within the RoW comes in two forms, evergreen and deciduous. Evergreen trees are generally controlled by non-chemical methods (brush saw or chain saw).

Deciduous trees, however, can be very difficult to control within the RoW by non-chemical methods of treatment only. Many deciduous trees and shrubs after being mechanically or manually cutback will re-sprout predominantly in the areas where cutting occurred, (also known as suckering). Suckering in deciduous trees and shrubs will substantially increase the requirements for vegetation management in the future. In order to reduce the need for future control of woody vegetation, an effective practice of

management often includes the application of a herbicide to the cut surfaces immediately after cutting has occurred.

3.2.3 Fungal and Microbial Growth

Fungus and microbes invade woody material such as bridge timbers, wooden supports, wooden retaining walls and other wood based structures that support the railway infrastructure. This is known as rot and it deteriorates the strength and longevity of the wood. To ensure track stability and safety, many wooden structures are treated to stop or impede wood rot. Specifically designed herbicides (Table 2) are inserted into the wood structures and then sealed to prevent the growth of unwanted vegetation.

3.2.4 Noxious Weeds and Invasive Plants

Noxious weeds and invasive plants can negatively impact agriculture, where they can displace or reduce the quality and quantity of crop and forage species. They can also out- compete native plant species, impacting biodiversity and wildlife forage. Consequently, such vegetation is targeted for control when and where it meets the thresholds as identified in section 3.4 below.

3.3 Monitoring Pest Populations

3.3.1 Monitoring Methods and Frequency of Monitoring

CN track supervisors, as part of their regular inspections, conduct incidental/cursory monitoring of weed/vegetation populations on the RoW, main tracks, sidings, yards, station tracks and crossings. Priority is given to making a visual assessment of vegetation impacting track conditions, at roadway crossings where sightline visibility is impaired, and vegetation conditions within the RoW that may present a hazard, they cover the following:

- A visual assessment of track conditions (with respect to weed growth);
- Road and pedestrian crossings with respect to the extent of weed/vegetation growth and to document if the required sightlines are being maintained; and,
- Vegetation conditions within the RoW to determine if trees and brush are a safety issue.

This information is supplemented with information provided by **CN** Safety Committees and from employee safety meetings regarding potential hazards to employees and the public associated with vegetation. These meetings are held on a regular basis (generally monthly or more frequently). In addition, **CN** also records complaints related to the presence of vegetation from the public.

3.4 Injury/Treatment Thresholds and Decision Making

The injury or treatment threshold is the point at which the abundance of unwanted vegetation and the damage they are causing, or likely to cause, indicate that control is necessary or desirable. A treatment decision regarding vegetation to manage is required when these thresholds are exceeded.

CN is heavily regulated and is subject to various federal legislation, including the RSA. Under the RSA, where there is a "hazard or condition that could reasonably be expected to develop into a situation in which a person could be injured or made to be ill or damage could be caused to the environment or property", the Minister of Transport and inspectors have a wide range of powers to order railways to take measures to address the threat or other concern, including vegetation. **CN** is therefore required to ensure that its RoW is free of vegetation that could be considered a safety hazard, or risk being subject to regulatory sanction. In this PMP the injury/treatment threshold is therefore the level of vegetative surface cover or vegetation height that can be tolerated and still maintain the integrity of, or safety at, the site.

Injury/treatment thresholds will vary, since vegetation control is more critical for certain areas than for others. They can be specific and include all species of unwanted vegetation (e.g. on track ballast, where there is a low tolerance for vegetative growth due to the potential to hinder inspection of track components or to impact drainage), or they can be specific to one species (e.g. where a single, tall growing tree or shrub species compromises sight lines, site security or worker safety). Consequently, the density of unwanted vegetation or the presence of a specific weed species will often dictate the level of control required.

Injury/treatment thresholds are part of the decision-making process. These thresholds ensure that vegetation management is contemplated only when unwanted vegetation exceeds a pre- set threshold. Above this threshold, unacceptable functional, economic and environmental damage may occur, as well as an increased risk to health and safety.

3.4.1 Density and Height of Unwanted Vegetation

In areas where the tolerance for unwanted vegetation is low, such as on track ballast, at road and pedestrian crossings and at signals (sightlines), and certain areas within rail yards, the density and height of all vegetation and dead organic matter on the site determines the treatment threshold.

3.4.2 Specific Weed/Vegetation Species to Manage

There are situations where the density of unwanted vegetation cannot be used as a criterion in determining when to initiate vegetation management action. The following situations, based on specific unwanted species, are examples of situations that may trigger a vegetation management action:

- The presence of a noxious weed or invasive plant species on a particular site;

- The height of the brush/trees within the RoW;
- The presence of danger trees;
- Vegetation that is compromising sight line requirements
- Trees or brush that compromise site security, create safety issues for employees (tripping, slipping or health hazards), or have branches in close proximity to power poles or poles used for communication purposes; and,
- Vegetation that is interfering with access to railway equipment (such as switches).

3.4.3 Decision Making

The decision to undertake vegetation management and the treatment method used will depend primarily on whether or not the injury/treatment threshold has been met for that particular area. The degree to which the threshold has been met, however, will also influence the decision for treatment. Thresholds that are met intermittently over small, localized areas may be deferred until control activities can be completed over a larger area. If specific safety hazards are identified, however, control activity may be accelerated or initiated. In addition, if **CN** Safety Committees, **CN** Track Supervisors, Transport Canada inspectors, or the public identify specific safety hazards, control activity may be accelerated or initiated notwithstanding the threshold levels.

3.5 Treatment Options and Selection Criteria

Once a decision has been made that vegetation management is required for an area, the selection of method(s) used will depend on the following criteria:

- Urgency of the required treatment and timing of the treatment;
- Species and composition of vegetation;
- Location of the unwanted vegetation (ballast, RoW, crossings, bridges, rail yards, station grounds);
- Accessibility to the unwanted vegetation (terrain, slope, remote areas);
- Safety issues (for the public, **CN** personnel and contractors);
- Risk of fire;
- Objectives of the vegetation management;
- Consequences of not taking action;

- Aboriginal and public concerns;
- Aesthetic considerations;
- Short and long-term impacts of the method(s) being considered;
- Expected efficacy of the method(s) being considered;
- Benefits and limitations of each method;
- Cost effectiveness of each method;
- Environmental considerations (proximity to water sources, bodies of water, food growing or planted for human consumption, riparian areas, wildlife and fish habitat); and,
- For herbicide treatments, the choice of herbicide, application methods/techniques and application equipment.
- Characteristics of the site, including the proximity of water bodies, water sources and environmentally sensitive features;
- The possibility of adverse impacts to wildlife, fish, surrounding land, workers and bystanders;
- Existing soil types, weed species present, reasons for control, and how they relate to the suitability of the particular method(s) being considered; and,
- The consequences of not treating.

Prior to treatment, areas where unwanted vegetation is growing will be documented. Locations of environmentally sensitive features such as proximity to water bodies and water sources will be identified in the field prior to treatment.

Under this PMP, the techniques proposed may include:

- Manual and mechanical methods;
- Biological control;
- Alternative technologies; and,
- Chemical control (herbicide applications).

In addition to the above, **CN** also undertakes tree removal, revegetation, and eliminating seed sources. These preventative/manual methods have been previously described in Section 3.1 (Prevention).

These control options, including their advantages and disadvantages are described in more detail in the following sections.

3.5.1 Mechanical and Manual Control Methods

Mechanical and manual control methods may include hand removal or cutting, weed trimming, mowing, brush cutters and chain saws. A description of these methods, the rationale for each control options, including the benefits and limitations of each control option, are described in more detail in Table 1.

Table 1: Description, Rationale, Benefits and Limitations of Manual/Mechanical Control Methods

Hand Removal and Cutting are viable manual control methods for manageable areas of established vegetation where the roots or stems can be fully removed such as small patches of noxious weeds or invasive plants, young tree seedlings, and clumps of grass. Hand removal and cutting may be used around signs, switches, shops and buildings, or where chemical controls (herbicides) cannot be used.	These methods produce immediate results and can be conducted throughout the growing season. They are effective if the number of weeds to be pulled or cut is small and the site is a manageable size. In areas where there has been little vegetation management undertaken for an extended period of time, hand removal and cutting can be effective in reducing a large volume of vegetation to a manageable level. These methods are costly, however, because they are slow and labour intensive. In addition, vegetative debris must be removed from the site and the re-growth of undesirable vegetation within the disturbed areas often occurs.
Weed Trimming can be used in areas such as along fence lines, around switches, signs and equipment, and in areas around buildings, shops, and material storage piles.	Weed trimming allows the unwanted vegetation to be cut to the ground level. When done early in the season, it helps remove seed heads. For small areas in close proximity to environmentally sensitive areas where herbicides cannot be used, it may be an effective non-chemical option. Weed trimming does not remove roots, however, and is only of limited effectiveness against weed species that reproduce from stem pieces.
Mowing and Brush Cutters are effective for the removal of brush and small trees from the right-of-way for the maintenance of sight line requirements, and within station grounds, around fencing, signs, equipment, buildings, bridges, signals and communication equipment. Mowers and brush cutters are generally mounted on high rail vehicles that travel on the tracks. They effectively cut most vegetation to a height of 10 to 20 cm, and extend from	Mowing and brush cutting quickly removes vegetation, may reduce seed sources for ballast infestation, and leave treatment areas aesthetically pleasing. These methods, however, are slow, they remove all vegetation (including desirable plant species), and they encourage plant re-growth or suckering of species such as willow, alder, maple, cottonwood and Himalayan blackberry. Mowing and cutting may sometimes be followed by the selective application of herbicides to cut areas including stems, emerging foliage and stumps to reduce the re-growth of unwanted deciduous vegetation. This is especially

the shoulder of the ballast out into the inner right-of-way for 4 to 6 meters.	important for the management of Himalayan blackberry, which grows extensively throughout the Lower Mainland and Fraser Valley areas. These techniques also increase maintenance requirements, can create a safety hazard for both workers and animals by leaving sharp, exposed cut stems, and can increase the fire hazard if the plant debris is not removed.
Chain Saws are generally used in the outer right-of-way to remove or prune trees and tall shrubs that cannot be reached by mowers or brush cutters, for the removal of "danger trees" that pose a hazard of falling onto the track, and for tree removal to maintain sight lines in residential areas, on the inner and outer right-of-ways, at curves, at road and pedestrian crossings, and within Environmentally Sensitive Zones (ESZ) such as adjacent to bridges and watercourses.	The use of chain saws provides immediate results and provides selective control of vegetation. They can also be used in areas where herbicides cannot be used such as adjacent to bridges and watercourses. The use of chain saws, however, is physically demanding, and there is a risk of injury to the operator from wood debris and broken chains.

3.5.2 Biological Control Methods

Biological management of vegetation species can be an effective way to reduce problematic plant species by planting and favouring low growing, non-invasive species, such as grasses. This is most commonly done by planting appropriate species along the RoW where construction projects have removed the vegetation cover.

3.5.3 Chemical Control (Herbicides)

Although the objective is to minimize the use of herbicides for the control of problem vegetation, herbicides are an imperative tool in railway vegetation management. The non-chemical control options described in Sections 3.5.1. and 3.5.2 are an important part of CN's vegetation management program but these methods can be less effective, impractical, dangerous for workers and incompatible with environmental protection values (i.e. increased fire hazards) This is especially true in areas where non-chemical methods cannot be employed or are not effective, or in areas such as track ballast where there are no effective non-chemical control alternative available. In certain areas, mechanical methods cannot be used for vegetation control because of terrain that creates hazardous conditions for the equipment or equipment operator, or where excessive vegetation growth rates make mechanical control ineffective over the long term.

3.5.3.1 Herbicide Identification

The herbicides' active ingredients proposed for targeting unwanted vegetation within this PMP are listed in Table 2:

Table 2: Herbicide Active Ingredients Proposed for Possible Use *

aminocyclopyrachlor	aminopyralid	chloropicrin
chlorsulfuron	dicamba	diflufenzopyr
diuron	flumioxazin	fluroxypyr
glyphosate	imazapyr	indaziflam
metsulfuron-methyl	picloram	pyroxasulfone
saflufenacil	triclopyr	2,4-D Amine

* Due to the proposed 5 year duration of the PMP, it is not possible to precisely forecast with certainly which herbicide active ingredients will or will not be used. The above list includes all possible active ingredients that may be used within the term of the PMP. Many of the above-listed active ingredients are sold under a variety of Trade Names. **CN** reserves the right to utilize any and all of the available products

(i.e. Trade Names) for the above listed active ingredients provided that they are registered for the intended purpose under the Federal *Pest Control Products Act.*

3.5.3.2 Adjuvant Identification

An adjuvant is any substance (surfactant) in a herbicide formulation or added to the spray tank to improve herbicidal activity or application characteristics. Spray adjuvants are generally grouped into two broad categories – activator adjuvants and special purpose adjuvants.

Surfactants increase the penetration, coverage and overall effectiveness of almost any herbicide.

Table 3: Adjuvants Proposed for Possible Use

Aquasoft	Lo-Drift	Hasten NT	Gateway
Onsite	On Target	Xiameter	

3.5.3.3 Criteria of Herbicide Treatment for Specific Area and Purpose

Table 4 summarizes the reasons for possible use of herbicide for the management of unwanted vegetation within specific areas or for specific purposes:

Table 4: Areas/Purpose of and Use of Herbicide Active Ingredients

Area/Purpose of Use	Criteria for Herbicide
Ballast, Station Grounds, Yards, Crossings, Bridges, Around Shops, Material Storage Areas and Buildings	Ballast section treatment includes all tracks within the PMP area. As noted earlier, there are no effective non-chemical controls for ballast vegetation management. Historically, all major yards have been treated with herbicide annually, due to the treatment thresholds having been exceeded. Treatment of mainline, sidings, and station tracks are carried out as and where required if the applicable treatment threshold has been exceeded. Factors such as track type, site details (e.g. the type of vegetation present and the presence of environmentally sensitive areas adjacent to proposed treatment sites), and past management results determine the priority, frequency, and type of vegetation management treatment selected. The track type is a major factor in determining the prioritization of ballast vegetation management each year. For example, primary yards and mainline track have the highest priority for vegetation management due to their high levels of traffic and associated safety concerns. Treatment with appropriate herbicide active ingredient(s) listed in Table 2 may be required for ballast vegetation management.
RoW	Areas within the RoW that are vegetated with a suitable and stable cover of low growing plant species that do not pose a fire or safety risk to the public, **CN** or its personnel, and will not be managed. However, in instances where noxious weeds or invasive plants are present, or where tall growing vegetation is impeding sight line requirements or compromising access to buildings, signals, communication and electrical infrastructure, treatment with one of the listed herbicide active ingredients may be done. Treatment with appropriate herbicide active ingredient(s) listed in Table 2 may be required for the right-of-way.
Maintain Sightline Requirements	The maintenance of sightlines is most critical at vehicle and pedestrian crossings or on approaches to bridges to which the public has access. Deciduous vegetation has the capacity to re-sprout following mechanical control methods. The listed herbicide active ingredients may be foliar applied, applied to cut stumps, to the basal bark areas of individual deciduous trees following mechanical cutting or mowing to stop re-sprouting, or in areas where mechanical methods are not feasible or practical. Treatment with appropriate herbicide active ingredient(s) listed in Table 2 may be required for maintenance of the sight line.
Anti-fungal treatment to wood structures (bridge timbers, piles, etc)	To ensure the safety and longevity of wood timber structures, supports, piles, etc., the application of a fumigant fungicide, liquid preservative or paste preservative is used to prevent the deterioration of wood through fungal and microbial attack. The use specific fungicide or liquid preservative is inserted into the wood to be treated and capped so that it embeds within the wood fibers for the necessary control. The paste preservative is applied externally and then wrapped with a polyethylene film to prevent leaching into surrounding ground. Treatment with appropriate herbicide active ingredient(s) listed in Table 2 may be required for vegetation management on wood structures.

Area/Purpose of Use	Criteria for Herbicide
Danger Trees	Treatment with appropriate herbicide active ingredient(s) listed in Table 2 may be applied to cut stumps of individual deciduous danger trees following mechanical cutting to stop re-sprouting.
Noxious Weeds and Invasive Plants	Where noxious weeds and invasive plants have been identified, treatment with appropriate herbicide active ingredient(s) listed in Table 2 may be required.

3.5.3.4 Herbicide Application Equipment

The application equipment proposed for use in applying herbicides include:

3.5.3.4.1 Backpack

A backpack is a portable, manually operated, pressurized container with a positive shut-off system and a nozzle for applying herbicides. It operates under low pressure, thus minimizing the possibility of drift. It is particularly useful for spraying small areas or individual trees, shrubs or plants. Within this PMP, backpack sprayers may be used for the foliar or soil application of herbicides for vegetation management, for the application of herbicides to cut surfaces (i.e. stumps) following manual or mechanical controls, and for the control of noxious weeds and invasive plants.

3.5.3.4.2 Wick/Wipe On Applicator

Wick/wipe on application may be used to selectively apply herbicides by wiping them directly onto plants. Only small amounts of herbicides are applied, so the need for pumps, control devices and spray tanks is eliminated. Wick/wipe on applications are ideal for vegetation management in areas where no spray drift can be tolerated. Wick/wipe on applications may be used for the application to cut surfaces (i.e. stumps) following manual or mechanical controls, and for the control of noxious weeds and invasive plants.

3.5.3.4.3 Handgun (Power Hose and Nozzle)

A handgun (power hose and nozzle) is a hand-held spray gun and hose attached to a portable tank filled with herbicide solution, usually with a power driven pump to provide pressure to the herbicide solution in the hose. Handguns are generally used where large areas of vegetation have to be controlled, but may also be used for the control of noxious weeds and invasive plants. Applications can be made from a hi-rail vehicle, spray train or from an all-terrain vehicle traveling adjacent to the tracks. Within this PMP, handguns may be used for the foliar or soil application of herbicides for vegetation management, and for the control of noxious weeds and invasive plants.

3.5.3.4.4 Shrouded Boom Sprayer (mounted)

These sprayers are designed to distribute herbicide solutions evenly over large areas. They are used to deliver low to moderate application rates. Under this PMP, they are mounted on a hi-rail vehicle or spray train with a power driven pump, and are used only for the application of herbicides to track and ballast areas.

3.5.3.4.5 Capsule Injection

The herbicide is delivered through capsules cored into the wood structures and capped. This is completed using hand held tools in areas of high rot risk and is useful in increasing the longevity of wood structures.

3.5.3.4.6 Radiarc Sprayer

Is a precision, boomless application device used for the application of herbicides and plant growth regulators in a uniform pattern while providing excellent drift control when applied in low spray volumes. The sprayer can be mounted on the side of a hi-rail spray vehicle or spray train for application of weed and brush control herbicides to the RoW.

3.5.3.5 Herbicide Application Methods

The herbicide application methods proposed for use under this PMP include any of the above-noted applications. A description, rationale for use, and the benefits and limitations of each of these application methods is shown in Table 5.

Table 5: Description and Rationale, Benefits and Limitations of Herbicide Methods

Description & Rationale	Benefits & Limitations
Foliar applications involve use of a controlled sprayer or a handgun, and can be used to apply all of the active ingredients. This method is most effective when the target vegetation is actively growing.	Foliar applications can be carried out at any time of the year, provided the target plants are actively growing. As foliar applications are susceptible to drift, caution must be exercised around desirable plants and environmentally sensitive areas.
Wick/Wipe-on applications involve the use of a wick soaked with herbicide active ingredients including glyphosate, dicamba or triclopyr that are wiped or dragged over the foliage of the target vegetation. The wick applicators are available in various materials and in many sizes. This technique will generally be used where cut stumps have re-sprouted, or for treating small patches of vegetation, invasive plants or noxious weeds in areas where no drift can be tolerated.	This application technique virtually eliminates drift and is useful for the safe and effective treatment of individual plans or stems located in areas of desirable vegetation. This technique is labour intensive, however, and is only practical to use for small treatment areas or for a small number of individual plants.

Description & Rationale	Benefits & Limitations
Cut Surface applications will be used in conjunction with manual treatments for controlling deciduous vegetation. With this method, the unwanted vegetation is cut as low to the ground as possible and the herbicide is applied to the cut surface of the stump to limit re-sprouting.	This method is preferable in highly visible areas or in areas where standing dead trees do not meet treatment objectives. Because herbicide application is restricted to the cut surface of freshly cut stumps, there is generally no herbicide drift, resulting in minimal impact to fish, wildlife, and bodies of water, water sources, and food intended for human consumption. Cut surface applications pose little risk of herbicide exposure to workers or the general public. If treatment is not undertaken immediately following physical control, this technique may not be successful.
Capsule Injection applications will be used for the application against fungus and rot that grows in wood such as timber bridges, retaining walls and mooring structures that support the track infrastructure. Capsules of herbicide are inserted by hand into a cored hole in the wood and capped	This method is used in structures that support the weight of the railway system and are integral to the safety of operations. As all treatment is done by hand, site specific treatment and the treated hole is sealed upon vial insertion into the timbers, there is limited to no herbicide escape from the treatment area.
Soil applications will be used for the application of the non-selective residual herbicide active ingredients to ballast and track areas and within station grounds only	The soil applied herbicide proposed for use will give season long control of all vegetation on ballast and track areas when applied at label rates. Care must be taken when applying these herbicides in close proximity to environmentally sensitive areas, and to avoid application conditions that will increase herbicide drift.

3.6 Post Treatment Evaluations

Post treatment monitoring is conducted to determine the effectiveness of the treatment, including any adverse effects. Visual inspections by CN personnel are completed regularly and spot checks by the qualified applicator are completed to verify the necessary level of vegetation control has been achieved. Post-treatment monitoring is generally completed in late summer or early fall. However, in the case of late summer or autumn treatments, post-treatment evaluations are usually carried out the following spring. The information recorded during post treatment evaluations includes:

- Name and contact information of the person conducting the inspection;
- Date of inspection;
- Areas where herbicides were applied (ballast or right-of-way);
- Treatment effectiveness (ineffective, semi-effective, effective);
- Environmental protection measures taken, if applicable; and,
- Adverse effects observed and comments.

4.0 OPERATIONAL INFORMATION

The operational information included in this section includes:

- Qualifications and responsibilities of persons applying herbicides;
- Procedures for safely transporting herbicides;
- Procedures for safely storing herbicides;
- Procedures for safely mixing, loading and applying herbicides;
- Procedures for the safe disposal of empty herbicide containers and unused herbicides; and,
- Procedures for responding to herbicide spills.

All persons working with herbicides will follow safe handling practices for transportation, storage, handling, application, and disposal of herbicides as required by applicable legislation.

4.1 Qualifications and Responsibilities for Applying Herbicides

All herbicide applications will be conducted or supervised by a person who holds a Pesticide Applicator Certificate endorsed for the class of herbicide and the herbicide use required for herbicide applications under this PMP. All contractors who apply herbicides under this PMP must have a valid BC Pesticide User License.

4.1.1 CN requires the Certified Pesticide Applicator:

- Is in continuous attendance at the site;
- Has available proof of certification;
- Supervises no more than 4 uncertified assistants at one time;
- Has a safety management plan in place
- Maintains continuous contact, auditory and/or visual, with the uncertified assistants;
- Be within 500 meters of persons being supervised; and,

In addition to the above responsibilities, it is a CN policy that all applicators (certified or otherwise) hold the following additional qualifications:

- Has completed the required training to work on railway property (through eRailsafe

or other program as determined by CN);

- Have Transportation of Dangerous Goods Qualification;
- Have basic first aid training; and,
- Have Workplace Hazardous Materials Information System (WHMIS) training.

4.2 Safely Transporting Herbicides

The transportation of herbicides will comply with all applicable laws governing their transport. Personnel shall follow these procedures for safely transporting herbicides:

- Limit the amount of herbicides that will be carried in any one vehicle. The quantity shall be no more than what is necessary for each project, except where transportation occurs between storage facilities;
- Ensure that herbicides are carried in a compartment that is secured against spillage and unauthorized removal. The compartment shall be separate from food and drinking water, safety gear, spill containment equipment and people;
- Inspect all herbicide containers for defects prior to transporting. Keep herbicides in their original containers and with original labels. If original labels are not available, the herbicides shall be placed in appropriate containers that have the trade name, active ingredient concentration and pesticide registration number affixed to the outside of the container;
- Ensure that the vehicle is equipped with a first aid kit, fire extinguisher, spill contingency plan and kit (stored separately from herbicides), and that the vehicle operator has been trained on how to handle spills;
- Ensure that all documents and placards are carried in, or placed on, transport vehicles if required under the Transport of Dangerous Goods Act, R.S.B.C 1996, c. 458, and regulations; and,
- Read and understand the herbicide labels and the product Material Safety Data Sheet (MSDS) for all herbicides being transported.

4.3 Safely Storing Herbicides

- Ensure that herbicides are stored in accordance with applicable standards and legislation;
- Keep herbicides in their original containers and with original packaging. If original packaging is not available, the herbicides shall be placed in appropriate containers

that have the trade name, active ingredient concentration and pesticide registration number affixed to the outside of the container;

- Ensure that storage facilities are locked when left unattended, ventilated to the outside atmosphere, are entered only by persons authorized to do so, and that there is a placard affixed and maintained on the outside of each door leading into the storage area bearing, in block letters that are clearly visible, the words "WARNING - CHEMICAL STORAGE - AUTHORIZED PERSONS ONLY"; and,
- Keep storage facilities separate from work and living areas, and away from food, flammable materials, bodies of water and water sources.

4.4 Safely Mixing, Loading and Applying

Personnel shall follow these procedures for safely mixing, loading and applying herbicides:

- Allow only certified pesticide applicators or individuals directly supervised by a certified applicator to mix, load and apply herbicides, and that all manufacturer's recommendations, as specified on the herbicide labels, are adhered to;
- Ensure that the contractor conducts safety briefings, including a review of emergency response plans prior to the commencement of any herbicide handling activities;
- Ensure the contractor has available adequate first aid kits, and that all personnel involved in applying herbicides have the appropriate level of personal protective equipment;
- Ensure that treatment areas are mapped, and that product labels, product information sheets, and MSDS are available on site for the quick reference and use by the applicators;
- Ensure that herbicide containers that have been used to prepare, mix or apply herbicide will not be washed or submerged in a body of water;
- Ensure that all mixing, loading and application of herbicides shall be undertaken in a safe manner. All mixing and loading shall be undertaken only in areas at least 15 meters from, and selected to prevent, any spilled herbicide from entering pesticide - free zones, no treatment zones, bodies of water, fish or wildlife habitat, water sources, or other environmentally sensitive areas;
- Prevent herbicides from entering any body of water or irrigation system by

maintaining a gap between the herbicides and the equipment used to draw water; and,

- Ensure all directions and restrictions on herbicide product labels are followed, including adhering to the recommended re-entry times to treated areas unless personal protective equipment is worn.

4.5 Safe Disposal of Empty Containers and Unused Herbicides

Personnel shall follow these procedures for safely disposing of empty herbicide containers and unused herbicides:

- Ensure that all herbicide waste is disposed of in a manner that meets the requirements of applicable legislation;
- Ensure that empty herbicide containers are returned to the herbicide distributor as part of their recycling program; or triple rinsed or pressure rinsed, altered so that they cannot be reused, and disposed of in a designated location or approved disposal site; and
- Ensure that all leftover herbicide mix is stored for future use in a manner that meets the requirements specified in Section 4.3.

4.6 Responding to Herbicide Spills

All personnel shall follow these procedures for responding to herbicide spills. If contractors that work under this PMP have their own spill response plan, they must meet or exceed the following plan:

- Ensure that appropriate protective clothing and safety gear is worn for protection from herbicide contamination;
- Ensure that the spill is contained from spreading using soil ridges, dams or other spill response supplies available and if possible the source of the spill is stopped.
- Cease all other operations until the source is contained;
- If applicable, spread absorbent material over the spill to absorb any liquid;
- Place all collected material into garbage bags or containers, with the contents clearly marked;
- Remove all soil or other material contaminated from the spill from the site and placed in garbage bags or containers;

- When more than 5 liters or 5 kg of herbicide is spilled, the contractor shall immediately report to CN Police 1-800-465-9239 who in turn will make arrangements for notification to all appropriate authorities including the BC Provincial Emergency Program by telephoning 1-800-663-3456
- Ensure that the **CN** manager responsible for the program is advised.

5.0 Environmental Protection Strategies And Procedures

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

- Strategies to protect community watersheds, domestic and agricultural water sources;
- Strategies to protect fish and wildlife, riparian areas, and wildlife habitat;
- Strategies to prevent herbicide contamination of food intended for human consumption;
- Pre-treatment inspection procedures for identifying treatment area boundaries;
- Procedures for maintaining and calibrating herbicide application equipment; and
- Procedures for monitoring weather conditions and strategies for modifying herbicide application methods for different weather conditions.

Prior to herbicide application, there are a number of activities that take place to ensure applications will be conducted safely and effectively. These include reviewing the treatment area, determining the type of herbicide to be used and reviewing the list of environmentally sensitive locations (i.e. culverts, bridges, PFZs, NTZs, etc), setting up treatment notices (posting signs at applicable public crossings), and verifying the public notification, safety requirements and treatment methodology.

On the day of application, the contract applicators review the job safety briefing, protection protocols and treatment areas. A **CN** flagging employee familiar with the area travels in a hi-rail vehicle ahead of the spray vehicle. An experienced applicator rides in the hi-rail calling out the no spray zones to the spray vehicle or completes a pre-trip inspection (a maximum of a few days ahead of time) and flags the no spray zone with spray paint, flagging tape or similar. Proper application respecting the buffer zones must be completed at the time of the spraying as conditions can change in the field with heavy rains or drought dramatically affecting spray zones. For this reason, flagging well ahead of time is discouraged.

5.1 Strategies to Protect Community Watersheds

CN has implemented strategies to protect community watersheds. The location of community watersheds to be protected will be verified by accessing the BC Government database

(Community Watershed web site maintained by the BC Ministry of Environment).

For herbicide applications proposed to occur within 100 meters of a community watershed boundary, the following strategies will be followed, where applicable:

- The location of community watershed boundaries will be verified by accessing the BC Government database (Community Watershed web site maintained by the BC Ministry of Sustainable Resource Management);
- Herbicides shall not be stored within community watersheds for more than 24 hours prior to their use, and removed from the community watersheds within 7 days of use, unless they are stored in a permanent structure; and
- PFZs and NTZs, in accordance with Table 6 below, for all waterbodies and all licensed water intakes in the community watersheds will be observed.

5.2 Strategies to Protect Domestic and Agricultural Water Sources and Bodies of Water

5.2.1 Definitions

Pesticide Free Zone (PFZ) is an area of land that must not be treated with pesticides, including herbicides and must be protected from herbicide moving on to it. The PFZ must be measured in horizontal distance from the high water mark of the body of water, dry stream or classified wetlands.

No Treatment Zone (NTZ) is an area of land that must not be treated with herbicide.

Body of water is any watercourse or body of water, such as a stream, river, wetland, or lake, but not including a human-made, self-contained body of water or structure of water.

Stream is a watercourse that contains water on a permanent or seasonal basis, is scoured by water, or contains observable deposits of mineral alluvium, and which has a continuous channel bed that is 100 m or more in length, or flows directly into a fish stream or a fish-bearing lake or wetland, or a licensed waterworks.

Wetland is a swamp, marsh, bog, or other similar area that supports natural vegetation, and which is distinct from adjacent upland areas.

Table 6 describes the minimum measures that shall be implemented to protect domestic and agricultural water sources, and bodies of water. The pesticide-free zones (PFZs) and no treatment zones (NTZs) in this table comply with the standards as specified in the IPMR.

Table 6: Minimum Domestic and Agricultural Water Source, and Water Body Protection Measures

Herbicide Applications	Ballast, Signal, Switch or Yard	Right-of-Way (excluding the ballast)
Domestic and agricultural wells and water intakes including all methods and herbicides.	**30 m NTZ***	**30 m NTZ***
Around or along a body of water or dry stream and classified wetland using any herbicide except glyphosate, subject to label restrictions and including all application methods	**10 m PFZ**	**10 m PFZ**
Selective applications to trees at crossings where a temporary body of water or dry stream is not fish bearing, and does not drain directly to fish bearing waters	**N/A**	**1 m NTZ**
Glyphosate Applications		
Along or around a body of water and classified wetland if the body of water: • is not fish-bearing at any time of the year • does not drain directly into a fish-bearing body of water	**2 m NTZ**	**2 m NTZ**
Along or around a body of water or a classified wetland that is: • fish-bearing, or • that drains directly into a fish-bearing body of water, or • along or around a dry stream that when wet is fish-bearing or drains directly into a fish-bearing body of water	**2 m PFZ**	**5 m PFZ**
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.	**Up to high water mark**	**Up to high water mark**
A dry stream that is not fish bearing at any time of the year and does not drain directly into a fish bearing body.	**0 m NTZ**	**0 m NTZ**
Noxious Weeds / Invasive Plants		
Selective application of glyphosate to Noxious Weeds and invasive plants adjacent to a body of water that is not fish bearing	**1 m PFZ**	**1 m PFZ**

*The 30 m NTZ may be reduced if the confirmation holder for this PMP is reasonably satisfied that the smaller zone will ensure that herbicide from the use will not enter the water supply, intake or well.

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

The establishment of pesticide free zones and no treatment zones discussed previously will help protect riparian areas and wildlife habitat. Riparian areas commonly extend for significant distances from the wetted perimeter of streams, lakes and wetlands, and vegetation within these areas is essential for bank stabilization and for regulating water temperatures. In addition, riparian areas are frequently high in biodiversity of both flora and fauna species and may be portions of critical habitats or travel corridors for wildlife.

CN will ensure that vegetation management activities are conducted in a sustainable and responsible manner to minimize potential impacts within environmentally sensitive areas including obtaining the following information and/or implementing the following protective strategies prior to control measures being implemented:

- Locate all bodies of water;
- If applicable, identify all bodies of water as fish-bearing or non-fish-bearing;
- If applicable, establish the boundaries of any required PFZ and NTZ;
- Select the most appropriate control method(s) that should be employed;
- Implement measures to minimize impact to vegetation cover, bank stability, turbidity and nutrient cycling;
- Ensure that there shall be no refueling of machinery, herbicide mixing, cleanup or disposal of herbicide materials within 15 meters of riparian zones; and,

The Federal Species at Risk Act: (SARA) protects endangered plant and wildlife species and aims to prevent their extinction and secure the necessary actions for their recovery.

Provisions of the SARA shall be adhered to. **CN** will attempt to avoid or reduce the impact to all listed species at risk, and will work cooperatively with regulatory agencies and stakeholders in any recovery planning. Where avoidance of impacts is not possible, **CN** commits to working with regulatory agencies and stakeholders on recovery planning processes. The level of participation will be determined by the degree of known impact the **CN** activities have on species including:

- The listing status of the species and other associated species;
- The likelihood and extent of impacts incurred by other stakeholders; and
- Consideration given to species of concern on existing **CN** property.

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

Vegetation control measures and herbicide products are carefully selected and appropriately managed to minimize the potential for impacts to non-targeted areas adjacent to the RoW including neighboring farms, gardens and known sites in undeveloped areas used by First Nations and others for harvesting plants intended for human consumption.

With respect to potential food sources within the RoW, unauthorized access is strictly forbidden under federal law and is enforced by CN Police. Nevertheless, supplementary precautions are taken to ensure that herbicide applications are conducted in a manner that will reduce the potential for herbicide contamination of food, such as berries. Precautions may vary based on site specific circumstances, but generally will include providing additional buffer zones around known plant harvesting areas during herbicide applications or adjusting the timing of herbicide applications.

The onus is on organic farmers to ensure that there is an adequate buffer zone between their farm and the CN property.

5.5 Maintaining and Calibrating Application Equipment

All herbicide application equipment utilized under this PMP will be in good working condition and properly calibrated to prevent the over-application and under-application of herbicide. Application equipment will be calibrated:

- At the start of each season;
- At the start of each treatment job;
- For each individual hand-held or backpack applicator;
- Any time the application equipment is changed;
- Any time there is a change in size or type of nozzle; and
- Any time the herbicide or formulation of herbicide is changed.

5.6 Monitoring Weather Conditions and Modifying Herbicide Application under Different Weather Conditions

Measurements shall be made to record weather conditions prior to and periodically during herbicide applications. Wind speed and direction, precipitation, temperature and sky conditions (clear, overcast, cloudy, partly cloudy) shall be recorded for foliar applications and boom sprayer applications. Temperature, precipitation, frost and dew conditions shall be recorded for stump or basal bark applications. Persons applying herbicides are responsible for checking each product label for guidelines for applying herbicides under various weather conditions.

Applications of herbicides will be suspended if:

- The maximum application temperature on the product label is exceeded;
- Ballast is frozen or saturated;
- Maximum wind speed as per the product label is exceeded or the wind speed and/or wind direction have the potential to cause herbicide drift from the intended target;
- If the application is a residual herbicide on water saturated soil, in heavy rainfall or imminent heavy rainfall (generally rainfall greater than 1 mm per hour during and for 24 hours after an application i.e. 2.4 cm over 24 hour period); or
- Foliage is covered by frost or ice, or if water is flowing on the foliage.

6.0 REPORTING AND NOTIFICATION

6.1 Treatment Location Records

Each contracting firm that applies herbicides for **CN** must maintain daily records of herbicide use.

The following records must be kept for each treatment location and day of use:

- The date and time of the herbicide use;
- The name of the pest targeted by the use or the purpose of the herbicide use;
- The trade name of each herbicide used and its registration number under the federal Act;

- For each herbicide used, the method and rate of application and the total quantity used;
- The prevailing meteorological conditions including temperature, precipitation and velocity and direction of the wind, these conditions should be measured at the beginning of each day before starting treatment, re-measured if obvious changes in environmental conditions occur throughout the day.
- Records must be retained for Annual Use Summary with "treatment location", in relation to a herbicide use, means the treatment area and the pesticide-free zones or no-treatment zones required under this regulation in relation to the use.

6.2 Annual Notice of Intent to Treat

CN will prepare and retain a detailed map showing the treatment locations for the applicable calendar year, which indicate the following for each treatment location:

- The proposed treatment areas; and
- The geographic features that require a pesticide-free zone or a no-treatment zone.

CN will forward, in writing, to the BC Ministry of Environment, at least 21 days prior to treatment in each year during which the PMP is in effect, an annual Notice of Intent to Treat (NIT). This NIT will identify:

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

6.3 Public Notification Prior to Treatment

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