

**REGIONAL DISTRICT
OF
NORTH OKANAGAN**



**PEST MANAGEMENT PLAN
for
NOXIOUS WEEDS - INVASIVE PLANTS**
PMP Confirmation No. 141-0029-07/12
March 2007



Available at: www.nord.ca

EXECUTIVE SUMMARY

In British Columbia the *Weed Control Act* and accompanying regulations require that land users and occupiers control noxious weeds on private and public land. This Pest Management Plan (PMP) outlines the Integrated Pest Management (IPM) approach for the control of noxious weeds/invasive plants, which will include prevention, manual, mechanical, biological and chemical controls on public lands owned or controlled by the Regional District of North Okanagan (RDNO). This PMP is the legal authority for the RDNO to use pesticides for the control of noxious weeds/invasive plants.

Noxious weeds/invasive plants impact lands by displacing or replacing native plant species. All resources occurring on infested lands are impacted by these plant species. The spread of these plants has resulted in reduced biodiversity, displaced native vegetation and degraded habitat quality. Loss of forage, browse for wildlife and livestock or loss of aesthetic values has negative socio-economic impacts. For these reasons, efforts to reduce these impacts through prevention and control are an integral part of managing lands within the RDNO.

The goal of the Noxious Weed program in the RDNO is to prevent the introduction of new species of noxious weeds/invasive plants, and reduce the spread of existing noxious weeds/invasive plants to minimize the impacts on lands within the RDNO. To achieve this, IPM principles will be used as described in this PMP. IPM involves noxious weed/invasive plant inventory, selection of treatment method that most effectively target specific noxious weed/invasive plant species while minimizing impacts to the environment, and evaluation of effectiveness of treatment.

The *Integrated Pest Management Act and Regulation* provides the statutory authority to allow pesticide use on public lands as described in a PMP. This PMP covers the selection of treatments that most effectively target specific noxious weeds/invasive plants while minimizing impacts to the environment. The vegetation management practices described in this PMP will include both non chemical and chemical options, and will discuss the selection process that the RDNO will use to decide on the most appropriate method(s) for vegetation management.

This PMP will serve as a strategic management planning tool which will allow for the effective prevention and control of noxious weeds/invasive plants on public lands owned or controlled by the RDNO.

**Regional District of North Okanagan
Pest Management Plan
Noxious Weeds – Invasive Plants**

TABLE of CONTENTS

1.0	PEST MANAGEMENT PLAN SUMMARY	1
1.1	OVERVIEW OF PLAN	1
1.2	TERM OF THIS PLAN	1
1.3	PRIMARY LAND USE	2
1.4	HISTORY OF PEST MANAGEMENT ACTIVITIES	2
1.5	RESPONSIBILITY FOR MANAGING PESTS.....	3
1.6	LEGISLATION AND REGULATORY REQUIREMENT.....	3
1.6.1	Okanagan Shuswap Land and Resource Management Plan.....	4
1.6.2	Pest Management Regulatory Agency	4
2.0	INTEGRATED PEST MANAGEMENT PROGRAM.....	4
2.1	PREVENTION.....	5
2.2	IDENTIFICATION	6
2.2.1	Noxious Weeds	6
2.2.2	Invasive Plants.....	8
2.3	MONITORING	9
2.4	TREATMENT THRESHOLDS.....	9
2.4.1	Noxious Weed/Invasive Plant Control Strategy.....	12
2.5	TREATMENT OPTIONS.....	13
2.5.1	Mechanical, Manual and Cultural Weed Control.....	13
2.5.2	Biological Weed Control.....	14
2.5.3	Chemical Weed Control	16
2.5.4	Treatment Selection.....	21
2.5.5	Treatment Area Evaluation	23
2.5.6	Specific Treatment Options by Weed Species	24
2.6	INTERAGENCY NOXIOUS WEED/INVASIVE PLANT PLANNING.....	26
3.0	PESTICIDE APPLICATION AND OPERATIONAL PRACTICES	26
3.1	QUALIFICATIONS AND RESPONSIBILITIES OF PERSONS APPLYING PESTICIDES	27
3.2	PROCEDURES FOR SAFELY TRANSPORTING PESTICIDES.....	27
3.3	PROCEDURES FOR SAFELY STORING PESTICIDES.....	28
3.4	PROCEDURES FOR SAFELY MIXING, LOADING AND APPLYING PESTICIDES.....	28
3.5	PROCEDURES FOR SAFE DISPOSAL OF EMPTY PESTICIDE CONTAINERS AND UNUSED PESTICIDES.....	29
3.6	PESTICIDE SPILL RESPONSE PLAN	29
3.7	BOUNDARY MARKING PROCEDURES	30
4.0	ENVIRONMENTAL PROTECTION STRATEGIES AND PROCEDURES	31
4.1	STRATEGIES TO PROTECT COMMUNITY WATERSHEDS	31
4.2	STRATEGIES TO PROTECT DOMESTIC AND AGRICULTURAL WATER SOURCES.....	31
4.3	STRATEGIES TO PROTECT FISH AND WILDLIFE, RIPARIAN AREAS AND WILDLIFE HABITAT	33
4.3.1	Strategies to Protect Riparian Areas.....	33
4.3.2	Strategies to Protect Wildlife Habitat.....	33
4.4	STRATEGIES TO PREVENT CONTAMINATION OF FOOD INTENDED FOR HUMAN CONSUMPTION	34
4.5	PRE-TREATMENT INSPECTION PROCEDURES FOR IDENTIFYING TREATMENT AREA BOUNDARIES	34

4.6	PROCEDURES FOR MAINTAINING AND CALIBRATION OF PESTICIDE APPLICATION EQUIPMENT.....	34
4.7	PROCEDURES FOR MONITORING WEATHER CONDITIONS AND STRATEGIES FOR MODIFYING PESTICIDE APPLICATION METHODS FOR DIFFERENT CONDITIONS.....	35
5.0	REPORTING.....	35
5.1	CONFIRMATION HOLDER USE RECORDS.....	36
5.2	REQUESTS TO AMEND THE PMP.....	37
5.3	ANNUAL SUMMARY OF PESTICIDE USE.....	37
6.0	NOTIFICATION.....	37
6.1	NOTIFICATION OF PMP CONFIRMATION.....	37
6.2	ANNUAL NOTICE OF INTENT TO TREAT.....	37
6.3	TREATMENT NOTICE.....	37
7.0	CONSULTATION.....	38
7.1	PUBLIC CONSULTATION PLAN.....	39
7.2	PUBLIC CONSULTATION REPORT.....	40
7.3	FIRST NATION CONSULTATIONS.....	40
7.4	CONSULTATION WITH REGIONAL PESTICIDE REVIEW COMMITTEE.....	40
8.0	REFERENCES.....	40

LIST OF APPENDICES

APPENDIX 1	MAP.....	A1 - 1
APPENDIX 2	LEGISLATION.....	A2 - 1
APPENDIX 3	PESTICIDE INSPECTION REPORT AND CHECKLIST.....	A3 - 1
APPENDIX 4	SPRAYER CALIBRATION TEST FORM.....	A4 - 1
APPENDIX 5	SITE AND INVASIVE PLANT INVENTORY RECORD.....	A5 - 1
APPENDIX 6	INVASIVE PLANT CHEMICAL & MECHANICAL TREATMENT RECORD.....	A6 - 1
APPENDIX 7	PESTICIDE USE RECORD FORM.....	A7 - 1
APPENDIX 8	CHEMICAL OR MECHANICAL MONITORING RECORD.....	A8 - 1
APPENDIX 9	BIOLOGICAL CONTROL AGENT DISPERSAL RECORD.....	A9 - 1
APPENDIX 10	BIOLOGICAL CONTROL AGENT RELEASE & MONITORING RECORD.....	A10 - 1

TABLES

Table 1 – Noxious Weeds within all regions of British Columbia.....	7
Table 2 – Noxious Weeds within the RDNO.....	7
Table 3 – Noxious Weeds within the OSFD.....	7
Table 4 – Invasive Plants List, FRPA Invasive Plants Regulation.....	8
Table 5 – Noxious Weed/Invasive Plant Categories within the RDNO.....	10
Table 6 – Noxious Weed/Invasive Plant Site Priorities within the RDNO.....	11
Table 7 – Injury Thresholds.....	12
Table 8 – Biological Control Agents in B.C.....	15
Table 9 – Pesticide Application Rates/Site Characteristics.....	19
Table 10 – Treatment Methods EXCLUDING Chemical Control.....	22
Table 11 – Treatment Methods INCLUDING Chemical Control.....	22
Table 12 – Water Protection Measures.....	32

1.0 PEST MANAGEMENT PLAN SUMMARY

The *Integrated Pest Management Act* (IPMA) provides the statutory authority for pesticide use on public and private land within this Pest Management Plan (PMP). The use of pesticides for the containment and control of noxious weeds/invasive plants by the Regional District of North Okanagan (RDNO) noxious weed/invasive plant control program follows the principles of Integrated Pest Management (IPM) used throughout the province. The containment and control of noxious weeds/invasive plants in the IPM context is achieved by cultural, mechanical, biological and pesticide methods with the objective of preserving agricultural lands and crops, as well as important biological diversity, wildlife habitat, range forage and browse species, and an aesthetically pleasing landscape for recreational use.

The PMP contains information on the RDNO's obligations, and commitments, treatment methods, environmental considerations, and operational standards, as well as reviewing the various noxious weeds/invasive plants occurring within the RDNO. The area of the PMP encompasses the RDNO, which occupies approximately 787,191 hectares of land of which approximately 625,206 hectares are crown land, 50,624 hectares of land are parks, ecological reserves, Indian Reserves, and lakes, 111,361 hectares are municipal, public and private lands. The PMP documents the strategies used by the RDNO for noxious weed/invasive plant control as well as describing how environmental values and human health are protected, the standards used for pesticide applications, and the process followed for consultation with the public and First Nations.

1.1 OVERVIEW OF PLAN

The area covered by the PMP occurs within the RDNO and is shown in Appendix 1. For the purposes of interagency planning and biological weed control, the noxious weed inventory for the Okanagan Shuswap Forest District (OSFD) will generally be used to inventory weed infestations on crown, public and private lands. Because the RDNO is generally enforcing noxious weed/invasive plant control for the benefit of agricultural activity, and is a licensed service provider, chemical applications may occur on all lands but will usually occur on private, municipal, public, and utility corridor lands. The focus on noxious weeds enables the RDNO to partner with other agencies. The RDNO will collaborate to the extent possible, with other agencies to ensure that pest management activities are consistent with other agency PMPs in areas that overlap the RDNO. Biological controls may occur on all lands in conjunction with biological controls by the Ministry of Forests and Range (MOFR) and Ministry of Agriculture (MOA)

1.2 TERM OF THIS PLAN

This PMP has been prepared by the RDNO to describe its noxious weed/invasive plant control program and obtain authorization from the Ministry of Environment (MOE) for pesticide use within the RDNO. The PMP will be in force for a five-year period from the date that Confirmation of a Pesticide Use Notice has been obtained.

1.3 PRIMARY LAND USE

There are a variety of land uses within the RDNO area. Lands that are used for recreation, forestry, range lands, and so on, are generally Crown Lands within the OSFD. The rest of the RDNO area is made up of Incorporated Municipalities and Electoral areas. A number of public utility corridors, such as highway and road, hydro and gas and other utility right of ways, crisscross the region. Within the Municipalities and Electoral areas there are typical residential areas, suburban areas with large lots, small holding areas with small acreage, many of which have hobby farm activities, to larger properties in hay, grain, cattle, orchard, or other agricultural activities to very large farming operations. There are many areas within the RDNO that are not suitable for agricultural activities as well as vacant properties that are generally left in a natural, undisturbed condition.

The primary uses for lands within the RDNO that are usually included for noxious weed/invasive plant control programs are public utility corridors and more rural areas where natural resource extraction and the growing of hay, grain and other agricultural crops is predominant.

There are a number of geographic areas that have characteristic property types. They are:

- The City of Vernon, City of Armstrong, City of Enderby, Village of Lumby - primarily urban in nature with typical city type lots serviced by sewer/septic tank and municipal water systems.
- District of Coldstream – has a large urban area with typical city-type lots as well as some suburban areas, small holding and larger agricultural properties.
- Township of Spallumcheen – a few smaller urban areas with city-type lots with mostly larger properties producing hay and grain and other agricultural crops.
- BX area – some urban areas with city type lots intermingled with suburban and small holding properties. Agricultural activities include orchards, some hay productions and a variety of hobby farms.
- Commonage, Lumby-Mabel Lake valley, Enderby-Mabel Lake valley, Cherryville area – generally large properties producing a variety of agricultural crops, some recreational uses and some resource extraction.
- Enderby to Mara Lake area – some large properties producing a variety of agricultural crops, recreational uses, with a few intermingled small holding and urban areas.

1.4 HISTORY OF PEST MANAGEMENT ACTIVITIES

The RDNO program has been actively involved in noxious weed/invasive plant containment and control for many years. The purpose of program was and continues to be to prevent the invasion and establishment of non-native plant species (noxious weed/invasive plant) on agricultural croplands. Although noxious weed/invasive plant control activity is generally initiated by a complaint, there have also been programmed control activities on public utility corridors and for new invading species of weeds.

The RDNO is a licensed service provider and accordingly, provides noxious weed/invasive plant control with several licensed applicators throughout the growing season. Equipment that is in use are trucks equipped with self-contained power nozzles and hose-hand guns, backpack sprayers, wick-type applicators and a variety of mechanical cutting tools.

Chemical controls were the primary method of noxious weed/invasive plant control until about 1997 when the treatment strategies incorporated principles of IPM. These include biological, mechanical, manual, cultural and chemical control methods. Pesticides have been applied under the authority of a "Pesticide Use Permit" for many years. The most recent "Pest Management Plan" authorized the use of pesticides; Tordon 22K, Roundup, Transline, 2,4-D Amine 500, Banvel II, Grazon, Escort, Dycleer and Arsenal on a spot treatment basis for noxious weed/invasive plant control. Pesticide treatment generally occurs on road, railway and transmission rights-of-ways, and public and private lands.

The RDNO develops treatment schedules for a number of right-of ways (e.g. Highways) on a rotational basis. There are other planned programs that target specific weed species (e.g. Rush skeletonweed). However, many properties treated are private properties and are targeted because of the RDNO receiving a complaint or a referral from a Municipality within the RDNO. The treatment schedules form the framework for weed control activities and are updated annually and for various reasons may require modification through the season. When responding to complaints or referrals, adjacent properties are also inspected for noxious weed infestations. The RDNO has a digital mapping and property information system for various functions and is in the process of incorporating weed control activity information into that system. The RDNO Invasive Plant Committee is instrumental in the development of weed control activities.

1.5 RESPONSIBILITY FOR MANAGING PESTS

Within the RDNO, the primary contact for information relating to this PMP is John Friesen, R.P.F., Invasive Plants and Insects Coordinator. Mr. Friesen can be contacted at:

- Office: 250 550-3749
- Cell: 250 309-9100
- Sat.: 403 987-6156
- Email: john.friesen@nord.ca
- Mailing: Regional District of North Okanagan
9848 Aberdeen Road, Coldstream, B.C. V1B 2K9

1.6 LEGISLATION AND REGULATORY REQUIREMENT

The treatment of noxious weeds/invasive plants within the province of British Columbia falls under numerous Federal and Provincial Acts, Regulation and policies. Appendix 2 lists some of the legislation pertinent to vegetation management under this PMP.

1.6.1 Okanagan Shuswap Land and Resource Management Plan

This PMP and other activities undertaken by the MOFR are subject to Higher Level Plans. The Okanagan Shuswap Land and Resource Management Plan (OSLRMP) specifies specific noxious weed control objectives. These objectives are:

- Range – prevent and control noxious weeds on Crown land.
- Endangered and Rare Species - where feasible, use non-chemical methods to control noxious weeds within habitats of rare elements.
- Access - minimize or reduce the impacts of noxious weeds or weed species of concern due to road development and use as well as off-road use.
- All categories – minimize soil disturbances to reduce or eliminate establishment or spread of noxious weeds.

1.6.2 Pest Management Regulatory Agency

The Pest Management Regulatory Agency (PMRA) is responsible for protecting human health and the environment by minimizing the risks associated with pest control products. The PMRA carries out its responsibility by evaluating pesticides to ensure they meet the latest human health and environmental safety standards before being registered for use in Canada. The PMRA also re-evaluates older pesticides to ensure they remain acceptable for use based on the latest standards and sets safe residue levels for pesticides in food.

The PMRA collaborates with Environment Canada, Agriculture and Agri-Food Canada, the Canadian Food Inspection Agency and other organizations in environmental pesticide research and monitoring, including sustainable pest management. The PMRA's mandate is to prevent unacceptable risks to people and the environment from the use of pest control products.

2.0 INTEGRATED PEST MANAGEMENT PROGRAM

IPM is defined in legislation to mean “a process for managing pest populations that includes the following elements:

- Planning and managing ecosystems to prevent organisms from becoming pests;
- Identifying pest problems and potential pest problems;
- Monitoring populations of pests and beneficial organisms, damage caused by pests and environmental conditions;
- Using injury thresholds in making treatment decisions;
- Suppressing pest populations to acceptable levels using strategies based on considerations of:
 - Biological, physical, cultural, mechanical, behavioral, and chemical controls in appropriate combinations,
 - Environmental and human health protection; and

- Evaluating the effectiveness of pest management treatments.”

The RDNO noxious weed/invasive plant control program conducts weed control using IPM principles when selecting treatment options for noxious weed/invasive plant sites. When assessing a site and deciding on treatment options, consideration is given to:

- weed species priority, level of infestation, proximity to other similar infestations;
- threat to non-infested areas, distance from infested areas;
- expected efficacy of treatment, equipment required, cost of treatment;
- potential impact on environment and agriculture;
- effects to fish and wildlife; and
- cultural, recreational and other uses.

The most appropriate treatment method is then selected for the site. In the event that several options are available for use on a site, the selection will be made in favor of the option that will give the best weed control on the site for the long term (see Treatment Selection Sec.2.5.4).

2.1 PREVENTION

A key element in the RDNO’s long-term noxious weed/invasive plant control is education. The RDNO will continue to promote the development and distribution of educational material aimed at increasing public awareness of noxious weeds/invasive plants.

Preventing the spread and establishment of noxious weeds/invasive plants on non-infested sites is the most effective and often most economical method of noxious weed/invasive plant control. Vectors of noxious weed/invasive plant spread include, but are not limited to, wind, water, wildlife, livestock and man. Natural vectors are very difficult to control, however, when man is the vector, negligence or a lack of understanding can be the key contributors to noxious weed/invasive plant spread.

In all cases the seed or part requires a disturbed or acceptable site for establishment. The following preventative measures will help reduce the spread of noxious weeds/invasive plants:

- keep disturbance on non-cultivated lands to a minimum;
- grass seed all disturbed sites upon completion of activity with approved seed mix;
- manage plant communities to ensure health and vigor and to promote desirable species;
- when driving, stay on established roadways;
- check vehicles and field equipment for presence of noxious weeds/invasive plants when leaving infested areas;
- any isolated noxious weeds/invasive plants should be treated or pulled and removed from site for destruction;
- do not transport weed-infested hay or seed within plan area; and/or,
- report any new infestations to RDNO staff.

2.2 IDENTIFICATION

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

- Certain noxious weeds and invasive plants must be controlled by law;
- Depending on a plant's growth stage, growth rate, characteristics, physical location and degree of invasiveness, control may or may not be required; and
- Control methods may differ depending on the plant species. Some may be easily controlled by non-chemical methods, but others may only be effectively managed through the use of certain pesticides or a combination of both.

It is important to have a basic understanding of plant biology, including knowledge of growth stages, life cycles and classification, so that the safest, most appropriate and effective control methods may be used. RDNO staff will rely on publications, fact sheets, guidebooks, brochures and web based information to assist in the identification, management and control of noxious weeds and invasive plants.

The weed species that will be treated are those designated as noxious weeds and/or invasive plants for the Province of British Columbia and the RDNO. Prioritization of weeds to be treated is generally outlined in Sec. 2.4, Table 5, however it is recognized that the different geographic areas within the RDNO may have weed priorities unique to each particular area.

2.2.1 Noxious Weeds

Noxious weeds are plants that are typically introduced from other countries. These plants are generally very invasive and aggressive and do not have natural predators and pathogens to keep them from spreading. These plants can be highly destructive, competitive and difficult to control. They out compete native plant species and reduce forage for wildlife and livestock. Other detrimental effects include impacts on biodiversity, wildlife habitat, stream bank stabilization, watershed snow retention and runoff, recreational land usability, aesthetics and forest regeneration. The *BC Weed Control Act and Regulations* imposes a duty on land occupiers to control designated noxious plants within British Columbia. A noxious weed is defined as “a weed designated by regulation to be a noxious weed, and includes the seeds of the noxious weed”. Within this act, certain weeds are classified as noxious within all regions of the province and others are designated as noxious weeds within the boundaries of listed regional districts. The RDNO evaluates and treats all noxious weeds on these lists that it deems necessary at a given time and location. The current provincial and regional noxious weed lists are shown below:

Table 1 Noxious Weeds within all regions of British Columbia

Annual Sowthistle	<i>Sonchus oleraceus</i>	Purple Nutsedge	<i>Cyperus rotundus</i>
Canada Thistle	<i>Cirsium arvense</i>	Rush Skeletonweed	<i>Chondrilla juncea</i>
Crupina	<i>Crupina vulgaris</i>	Scentless Chamomile	<i>Matricaria maritima</i>
Dalmatian Toadflax	<i>Linaria dalmatica</i>	Spotted Knapweed	<i>Centaurea biebersteinii</i>
Diffuse Kapweed	<i>Centaurea diffusa</i>	Tansy Ragwort	<i>Senecio jacobaea</i>
Dodder	<i>Cuscuta spp.</i>	Velvetleaf	<i>Abutilon theophrasti</i>
Gorse	<i>Ulex europaeus</i>	Wild Oats	<i>Avena fatua</i>
Hound's-tongue	<i>Cynoglossum officinale</i>	Yellow Nutsedge	<i>Cyperus esculentus</i>
Jointed Goatgrass	<i>Aegilops cylindrica</i>	Yellow Starthistle	<i>Centaurea solstitialis</i>
Leafy Spurge	<i>Euphorbia esula</i>	Yellow Toadflax	<i>Linaria vulgaris</i>
Perennial Sowthistle	<i>Sonchus arvensis</i>		

Table 2 Noxious Weeds within the RDNO

Burdock	<i>Arctium spp.</i>	Russian Knapweed	<i>Acroptilon repens</i>
Common Tansy	<i>Tanacetum vulgare</i>	Scotch Thistle	<i>Onopordum acanthium</i>
Hoary Cress	<i>Cardaria spp.</i>	Sulphur Cinquefoil	<i>Potentilla recta</i>
Oxeye Daisy	<i>Chrysanthemum leucanthemum</i>		

Table 3 Noxious Weeds within the OSFD

Blueweed	<i>Echium vulgare</i>	Leafy Spurge	<i>Euphorbia esula</i>
Bull Thistle	<i>Cirsium vulgare</i>	Nodding Thistle	<i>Carduus nutans</i>
Canada Thistle	<i>Cirsium arvense</i>	Perennial Pepperweed	<i>Lepidium latifolium</i>
Common Bugloss	<i>Anchusa officinalis</i>	Plumeless Thistle	<i>Carduus acanthoides</i>
Common Toadflax	<i>Linaria vulgaris</i>	Rush Skeletonweed	<i>Chondrilla juncea</i>
Dalmatian Toadflax	<i>Linaria dalmatica</i>	Scentless Chamomile	<i>Matricaria maritima</i>
Diffuse Knapweed	<i>Centaurea diffusa</i>	Spotted Knapweed	<i>Centaurea biebersteinii</i>
Hawksweed	<i>Hieracium sp.</i>	Sulphur Cinquefoil	<i>Potentilla recta</i>
Hound's-tongue	<i>Cynoglossum officinale</i>	Tansy Ragwort	<i>Senecio jacobaea</i>

2.2.2 Invasive Plants

An invasive plant is defined as any alien invasive plant species that has the potential to pose undesirable or detrimental impacts on humans, animals and ecosystems. Invasive plants have highly adaptive, aggressive mechanisms of establishment and growth, and can cause serious economic and environmental impacts to forestry, agriculture, tourism/recreation, industries and First Nations. Invasive plants possess many of the same characteristics as the noxious weeds, and therefore considered to be pests. For the purposes of section 47 of the *Forest and Range Practices Act (FRPA)*, the prescribed species of invasive plants are as follows:

Table 4 Invasive Plants List, FRPA Invasive Plants Regulation

Anchusa	<i>Anchusa officinalis</i>	Meadow Knapweed	<i>Centaurea pratensis</i>
Baby's Breath	<i>Gypsophila paniculata</i>	Nodding Thistle	<i>Carduus nutans</i>
Black Knapweed	<i>Centaurea nigra</i>	Orange Hawkweed	<i>Hieracium aurantiacum</i>
Blueweed	<i>Echium vulgare</i>	Oxeye Daisy	<i>Chrysanthemum leucanthemum</i>
Brown Knapweed	<i>Centaurea jacea</i>	Perennial Pepperweed	<i>Lepidium latifolium</i>
Bull Thistle	<i>Cirsium vulgare</i>	Plumless Thistle	<i>Carduus acanthoides</i>
Canada Thistle	<i>Cirsium arvense</i>	Puncturevine	<i>Tribulus terrestris</i>
Common Burdock	<i>Arctium minus</i>	Purple Loosestrife	<i>Lythrum salicaria</i>
Common Tansy	<i>Tanacetum vulgare</i>	Rush Skeletonweed	<i>Chondrilla juncea</i>
Dalmatian Toadflax	<i>Linaria dalmatica</i>	Russian Knapweed	<i>Acroptilon repens</i>
Diffuse Knapweed	<i>Centaurea diffusa</i>	Scentless Chamomile	<i>Matricaria maritima</i>
Field Scabious	<i>Knautia arvensis</i>	Scotch Broom	<i>Cytisus scoparius</i>
Giant Knotweed	<i>Polygonum sachalinense</i>	Scotch Thistle	<i>Onopordum acanthium</i>
Gorse	<i>Ulex europaeus</i>	Spotted Knapweed	<i>Centaurea biebersteinii</i>
Hoary Alyssum	<i>Berteroa incana</i>	St. John's-wort	<i>Hypericum perforatum</i>
Hoary Cress	<i>Cardaria draba</i>	Sulphur Cinquefoil	<i>Potentilla recta</i>
Hound's-tongue	<i>Cynoglossum officinale</i>	Tansy Ragwort	<i>Senecio jacobaea</i>
Japanese Knotweed	<i>Polygonum cuspidatum</i>	Teasel	<i>Dipsacus fullonum</i>
Leafy Spurge	<i>Euphorbia esula</i>	Yellow Iris	<i>Iris pseudacorus</i>
Marsh Thistle	<i>Cirsium palustre</i>	Yellow Starthistle	<i>Centaurea solstitialis</i>
Meadow Hawkweed	<i>Hieracium pilosella</i>	Yellow Toadflax	<i>Linaria vulgaris</i>

2.3 MONITORING

Information on noxious weed/invasive plant species, size of infestations and weed density is collected by RDNO staff. Designing an effective noxious weed/invasive plant management program requires an understanding of the regional and local characteristics of the management area. Factors such as the location of environmentally sensitive areas, noxious weed/invasive plant species and their abundance and the general site conditions are important for selecting the best methods of management. This information is used to develop annual work plans, priorities and decisions on treatment.

The monitoring information collected includes:

- Plant species by common name;
- Plant category;
- Plant distribution;
- Site priority ranking;
- Density of the plants; and,
- Soil characteristics.

Weed inventories are conducted as part of regular inspections. Areas considered highly invasive for noxious weeds/invasive plants are monitored for weed invasion by RDNO staff. Monitoring is done visually and critical observations are recorded.

RDNO staff also receives information from the general public on the locations of new noxious weed/invasive plant infestations. These locations are then inspected and monitored on a regular basis.

Plant categories 1, 2 & 3 on high priority sites will be monitored more frequently than those of lower priority; refer to Sec. 2.4, Tables 5 & 6. Information will be collected to determine management objectives, what monitoring actions will be taken and what management action should be prescribed, if any action is required.

The following MOFR forms may be used to record inventory, treatment and monitoring information on noxious weed/invasive plant sites:

- Site and Invasive Plant Inventory Record (Appendix 5)
- Invasive Plant Chemical & Mechanical Treatment Record (Appendix 6)
- Pesticide Use Record Form (Appendix 7)
- Chemical or Mechanical Monitoring Record (Appendix 8)
- Biological Control Agent Dispersal Record (Appendix 9)
- Biological Control Agent Release & Monitoring Record (Appendix 10)

2.4 TREATMENT THRESHOLDS

To facilitate noxious weed/invasive plant control decisions, a Weed Control Strategy has been developed for consistent, efficient treatment. Noxious weeds/invasive plants are

prioritized into 4 categories according to level of concern to agriculture and natural resources, refer to Table 5. The categorization reflects more closely, the historical activity in RDNO. It is recognized that these may change if weeds that are not known to be in the area are discovered. As agricultural activities change and methods of weed control changes, so can the weed priorities change. It is also noted that different geographic areas within the RDNO may have different weed priorities.

Table 5 Noxious Weed/Invasive Plant Categories within the RDNO

Category 1 Extremely Invasive	Category 2 Very Invasive
Anchusa (Anchusa officinalis) Gorse (Ulex europaeus) Leafy Spurge (Euphorbia esula) Marsh Thistle (Cirsium palustre) Perennial Pepperweed (Lepidium latifolium) Puncturevine (Tribulus terrestris) Purple Loosestrife (Lythrum salicaria) Rush Skeletonweed (Chondrilla juncea) Spotted Knapweed (Centaurea biebersteinii) Sulphur Cinquefoil (Potentilla recta) Yellow Starthistle (Centaurea solstitialis)	Blueweed (Echium vulgare) Canada Thistle (Cirsium arvense) Common Tansy (Tanacetum vulgare) Dalmatian Toadflax (Linaria dalmatica) Diffuse Knapweed (Centaurea diffusa) Field Scabius (Knautia arvensis) Hoary Alyssum (Berteroa incana) Hound’s-tongue (Cynoglossum officinale) Orange Hawkweed (Hieracium aurantiacum) Plumeless Thistle (Carduus acanthoides) Scotch Thistle (Onopordum acanthium) Tansy Ragwort (Senecio jacobea) Teasel (Dipsacus fullonum) Yellow Hawkweeds (Hieracium sp.) Yellow Iris (Iris pseudacorus)
Category 3 Invasive	Category 4 Lessor Important Species
Baby’s Breath (Gypsophila paniculata) Batchelor’s Buttons (Centaurea cyanus) Black Knapweed (Centaurea nigra) Brown Knapweed (Centaurea jacea) Bull Thistle (Cirsium vulgare) Burdock (Arctium minus) Common Toadflax (Linaria vulgaris) Giant Knotweed (Polygonum sachalinense) Hoary Cress (Cardaria spp.) Japanese Knotweed (Polygonum cuspidatum) Meadow Knapweed (Centaurea pratensis) Oxeye Daisy (Chrysanthemum leucanthemum) Russian Knapweed (Centaurea repens) Scentless Chamomile (Matricaria maritima) Scotch Broom (Cytisus scoparius)	Nodding Thistle (Carduus nutans) St. John’s-wort (Hypericum perforatum)

- Category 1** Species are extremely invasive and are the highest risk into native vegetation, endangered ecosystems and recreational land. These species pose an extreme risk for invasion and spread into undisturbed sites.
- Category 2** Species pose a high risk of invasion and spread into native vegetation, endangered ecosystems and recreational land. These species are either less competitive than Category 1 species, or are more easily controlled due to their biology and ecology.
- Category 3** Species pose a moderate risk of invasion and spread into native vegetation, endangered ecosystems and recreational land.
- Category 4** Species pose a low to moderate risk of invasion and spread into native vegetation, endangered ecosystems and recreational land.

Weed infested sites are ranked according to priority and based on the system currently being used by the MOFR. The definitions of the four priorities are:

Table 6 Noxious Weed/Invasive Plant Site Priorities within the RDNO

Priority	Purpose or Intent
1 Extremely High Risk	To stop the spread of weeds threatening currently non-infested, highly susceptible sites. These sites are usually less than or equal to .25 ha. and there is a good expectation of control. This priority also includes sites that are threatening a large neighboring economic base.
2 High Risk	To stop the enlargement of sites in highly susceptible areas. These sites are usually less than or equal to 0.5 ha. and must have a reasonably good expectation of control.
3 Moderate Risk	To stop the enlargement of sites that are usually greater than or equal to 0.5 ha. in highly susceptible areas, or less than or equal to 0.5 ha. in moderately susceptible areas.
Footnote	<i>The majority of time and budget for the RDNO is consumed by categories 1,2,&3. Priority is given to areas that are directly impacting an agricultural crop, secondly to areas that are near croplands and thirdly to areas where no cropland is directly affected but where weeds could be transported from. Response to weeds in these areas is on the basis of complaints or requests received as well as monitoring and scheduled treatment areas. (consumes approximately 70% of time and budget)</i>
4 Low Risk	To stop the enlargement/contain sites usually greater than 0.5 ha. in moderately susceptible areas.
Footnote	<i>Category 4 weeds are generally responded to on a property specific request basis and occasionally on a complaint. The property owner usually takes control measures. Should there be a direct impact on an agricultural crop, RDNO crews will treat the weed.</i>

Using the Plant Categories and the Site Priorities, the RDNO has developed the treatment priority outlined in the table below.

Table 7 Injury Thresholds

Plant Category	Site Priority	Treatment Priority
1	1	1
1	2	2
2	1	3
2	2	4
3	1	5
3	2	6
All	3	7
All	4	8

Action to be taken on a weed infestation is determined by the category of the plant and the priority of a site. For example, rush skeletonweed (*Chondrilla juncea*) (Category 1) found in a new area (Priority 1) is ranked as 1-1 or an extremely invasive weed in an extremely high-risk site and therefore is of top concern.

It is recognized that noxious weed/invasive plant priorities are subject to change, as new species are identified as being detrimental to the agricultural community and as land use changes. There are also different priority weed species in the different geographic areas of the RDNO.

2.4.1 Noxious Weed/Invasive Plant Control Strategy:

For treatment decisions on a per site basis, the following strategy will be utilized whenever possible:

- (1) **Control** and where possible **eradicate** invading noxious weeds/invasive plants by the use of conventional weed control methods.
- (2) **Contain** the spread of noxious weeds/invasive plants into currently non-infested areas from established areas by the use of conventional weed control methods.
- (3) **Biological control** will be utilized in established weed infestation sites that are beyond containment by conventional methods and/or where conventional methods of weed control are not possible due to the location of the weed infestation, as follows:
 - under tree canopy.
 - on steep and irregular terrain
 - within a riparian area
 - within the buffer zone of a domestic water supply

2.5 TREATMENT OPTIONS

The selection of a particular IPM technique to control noxious weeds/invasive plants will depend on:

- Treatment timing;
- The species or complex of noxious weed/invasive plant being targeted;
- Species composition and percent cover;
- Site characteristics including land use, proximity to water sources, bodies of water, soil type and other environmentally sensitive areas;
- Environmental sensitivities in surrounding areas;
- Safety, economic impacts and site accessibility; and
- The consequences of not treating.

IPM techniques proposed for use under this PMP include:

- Mechanical, Manual and Cultural Weed Control;
- Biological Weed Control; and,
- Chemical Weed Control.

2.5.1 Mechanical, Manual and Cultural Weed Control

Mechanical and manual methods of weed control prevent weeds from producing seed and reduce the vigor of weed plants by cutting plants prior to seed production and depleting root reserves through repeated defoliation. Mechanical and manual control includes mowing, cutting, digging and hand pulling. Cultural weed control includes planned grazing systems to enhance the health and vigor of native plant communities as well as seeding areas of disturbed soil to reduce the spread of weeds. The following are examples of the RDNO's use of these methods.

Mechanical and Manual:

Gas powered weed whips and hand scythes are used to cut weeds in Pesticide Free Zones (PFZ's) along roads and other rights of ways before they go to seed (except riparian areas along waterways). Small patches of weeds or single scattered weeds are often hand pulled in these areas as well. Within municipalities, the RDNO makes recommendations for areas that should be mowed along municipal right of ways as well as other utility corridors. The municipality or utility will generally have a crew that can conduct the work. The RDNO will also hire contractors from time to time that can mow larger tracts of land where pesticide use is questionable such as lands owned by absentee landlords where the short and long-term use of the land cannot be definitively ascertained. Digging weeds is generally associated with hand pulling to assist in getting roots out as well. The RDNO does not recommend or practice burning or crushing of weeds as a control method. Weeds that are removed through hand pulling or as a result of cutting and gathering later in the season, when there may be seed set, are disposed of in a RDNO landfill.

Cultural: The RDNO is not equipped to practice cultural methods of weed control but does make recommendations to seed utility and municipal corridors and right of ways that have been disturbed. Occasionally the RDNO will contract out such work. On private lands, the RDNO does not make recommendations, however, owners are directed to the Ministry of Agriculture for information on pasture renovation, suitable grazing techniques, crop rotations, and other cultural practices that can improve croplands and help to control noxious weeds/invasive plants.

2.5.2 Biological Weed Control

The RDNO has requested bio-agents from time to time for a number of infestations of Canada thistle, Dalmatian toadflax, Spotted knapweed, Hound's-tongue and Leafy spurge. All bio-agent releases are done in conjunction with the MOA and MOFR bio-control program.

The MOFR biological weed control program was initiated in 1984. This program uses plant specific insects and fungi to reduce the number and density of noxious weeds/invasive plants within the province. The earliest efforts of biological control occurred in the 1950's when two beetle species were released to control the spread of St.John's-wort a perennial weed. Since that time the program has expanded to include knapweed, leafy spurge, toadflax, hound's-tongue and rush skeletonweed.

Biological control is the use of a weed's natural enemies (insects and pathogens) to reduce its population at or below a tolerable level. These natural enemies are used to establish a long-term balance between the biological organism and the weed. The agents are thoroughly tested before release to ensure that they will not harm native and desirable introduced plants. When effective, biological control provides self-perpetuating, self-dispersing, continual control of weeds. It is therefore a cost-effective, sustainable, and environmentally compatible means of controlling widespread introduced weeds.

Biological control agents usually reduce weed populations by decreasing plant vigor, reproduction, and competitive ability, which in turn encourages the dominance of the desired species. Bio-agents are primarily utilized in areas where weed infestations are too extensive to be reduced effectively by utilizing mechanical or pesticide methods, or in areas within a PFZ.

It is recognized that there is considerable research and screening by various agencies, of numerous bio-agents for many of the weed species. As these bio-agents become available, they may be released in suitable sites.

The following table lists biological control agents introduced to a number of noxious weeds/invasive plants in B.C. (the list may not necessarily be complete):

Table 8

Biological Control Agents in B.C.

BIOCONTROL AGENT	WEED SPECIES	MODE OF ACTION
<u>Agepeta zoegana</u>	<u>Centaurea biebersteinii</u> Spotted knapweed	Root feeder
<u>Aphthona cyparissae</u>	<u>Euphorbia esula</u> Leafy spurge	Root/shoot feeder
<u>Aphthona czwalinae</u>	<u>Euphorbia esula</u> Leafy spurge	Root/shoot feeder
<u>Aphthona nigriscutis</u>	<u>Euphorbia esula</u> Leafy spurge	Root/shoot feeder
<u>Chrysolina hyperici</u>	<u>Hypericum perforatum</u> St. John's-wort	Leaf/shoot feeder
<u>Cyphocleonus achates</u>	<u>Centaurea diffusa/biebersteinii</u> Diffuse/Spotted knapweed	Root feeder
<u>Eriophyes chondrillae</u>	<u>Chondrilla juncea</u> Rush skeletonweed	Reduces seed production by galling the stem
<u>Galerucella spp.</u>	<u>Lythrum salicaria</u> Purple Loosestrife	Feeds on leaves and stems
<u>Larinus minutus</u>	<u>Centaurea biebersteinii</u> Spotted knapweed	Seed reduction in seed head
<u>Larinus obtusa</u>	<u>Centaurea biebersteinii</u> Spotted knapweed	Seed reduction in seed head
<u>Longitarsus quadriguttatus</u>	<u>Cynoglossum officinale</u> Hound's-tongue	Damages roots flea beetle/root feeder
<u>Mecinus janthinus</u>	<u>Linaria dalmatica/vulgaris</u> Dalmatian/Common toadflax	Reduces seed production and root growth. weevil, stalk/root feeder
<u>Metzneria paucipunctella</u>	<u>Centaurea biebersteinii</u> Spotted knapweed	Seed head
<u>Mogulones cruciger</u>	<u>Cynoglossum officinale</u> Hound's-tongue	Reduces vigor of plant through damage to the root and stem. weevil/root feeder
<u>Pelochrista medullana</u>	<u>Centaurea biebersteinii</u> Spotted knapweed	Leaf feeder
<u>Puccinia acroptili</u>	<u>Acroptilon repens</u> Russian knapweed	Rust species affects photosynthesis and growth
<u>Puccinia chondrillina</u>	<u>Chondrilla juncea</u> Rush skeletonweed	stem rust
<u>Puccinia jaceae</u>	<u>Centaurea diffusa/biebersteinii</u> Diffuse/Spotted knapweed	Rust species affects photosynthesis and growth
<u>Rhinocyllus conicus</u>	<u>Cirsium arvense</u> Canada thistle <u>Carduus nutans/acanthoides</u> Nodding/Plumeless thistle	Reduces seed production of infested plants

BIOCONTROL AGENT	WEED SPECIES	MODE OF ACTION
<u>Sphenoptera jugoslavica</u>	<u>Centaurea biebersteinii</u> Spotted knapweed	Root feeder
<u>Urophora affinis</u>	<u>Centaurea diffusa/</u> <u>biebersteinii</u> Diffuse/Spotted knapweed	Seed reduction in seed head
<u>Urophora quadrifasciata</u>	<u>Centaurea diffusa/</u> <u>biebersteinii</u> Diffuse/spotted knapweed	Seed reduction in seed head
<u>Urophora solstitialis</u>	<u>Carduus acanthoides</u> Plumeless thistle	Seed reduction in seed head
<u>Urophora stylata</u>	<u>Cirsium vulgare</u> Bull thistle	Seed reduction in seed head

2.5.3 Chemical Weed Control

Pesticide applications are only one component of the RDNO noxious weed/invasive plant control program but their use is critical to control the spread of noxious weeds/invasive plants throughout the RDNO. Within the RDNO, pesticides will be used as a treatment for the control of noxious weeds/invasive plants on sites where a high level of control can be achieved. The general policy is towards selective application of pesticide as opposed to broadcast treatments. Generally these sites are isolated, small patches of noxious weeds/invasive plants that are immediately threatening a non infested area of Agriculture or Crown land or are located on a site where they are readily available for transport (seed or plant part) to a non infested area (eg. road side shoulder).

A herbicide is a term given to a pesticide used to manage or control unwanted plants. Herbicides proposed for targeting invasive plants within the RDNO are listed below by active ingredient:

- 2,4-D** (Trade name: **2,4-D Amine 500** – PCP Act reg. no. 14725)
(Trade name: **Dycleer 24** – PCP Act reg. no. 11547)
(Trade name: **Grazon** – PCP Act reg. no. 26649)

2,4-D is a selective, non-residual herbicide that is most effective when the target plant is growing rapidly. It is more actively taken up by the foliage than by the roots. 2,4-D can persist in soil for one to four weeks and may prove injurious to subsequent crops of sensitive plants. Products containing the active ingredient 2,4-D will be applied as a foliar spray using backpack sprayers or truck mounted spray tank with power hose and nozzle. Application equipment must be thoroughly cleaned with special materials before applying other pesticides to sensitive crops.

Aminopyralid (Trade name: *Milestone* – PCP Act reg. no. 28137)

Aminopyralid is a selective, post-emergent herbicide that controls a broad spectrum of broadleaf noxious weeds/invasive plants. It is mildly residual, and uses reduced application rates so to ensure a reduced herbicide loading on the site. Products containing the active ingredient aminopyralid will be applied as a foliar spray using backpack sprayers or truck mounted spray tank with power hose and nozzle.

Clopyralid (Trade name: *Transline* – PCP Act reg. no. 24085)

Clopyralid is a selective, post-emergent herbicide used to control herbaceous broadleaf noxious weeds/invasive plants. It has moderate soil residual activity. Clopyralid use is preferred in areas where pesticides of long residual soil activity should not be used. It is less persistent in soil and it does not kill many woody tree and shrub species. It is a good choice when an overstory of trees and shrubs is present at the infestation site and there is a need to minimize or prevent damage to these non-target plants. Products containing the active ingredient clopyralid will be applied as a foliar spray using backpack sprayers or truck mounted spray tank with power hose and nozzle.

Dicamba (Trade name: *Vanquish* – PCP Act reg. no. 26980)
(Trade name: *Banvel II* – PCP Act reg. no. 23957)
(Trade name: *Dycleer 24* – PCP Act reg. no. 11547)

Dicamba is a selective, post-emergent herbicide used to control herbaceous broadleaf noxious weeds/invasive plants. It provides a wide spectrum of broadleaf control and has low to moderate soil residual activity. Products containing the active ingredient dicamba will be applied as a foliar spray using backpack sprayers or truck mounted spray tank with power hose and nozzle.

Glyphosate (Trade name: *Roundup* – PCP Act reg. no. 13644)
(Trade name: *Vantage* – PCP Act reg. no. 26172)

Glyphosate is a non-selective and non-residual herbicide used to control a very large number of noxious weeds/invasive plants. It kills all vegetation on contact and is only effective for treating plants that have germinated, emerged above the soil, and are actively growing at the time of application. It is most useful near wells, water bodies and other environmentally sensitive areas where low soil residual is required. It can be applied to cut vegetation or young seedlings which emerge following cutting or hand pulling, or where physical control methods do not provide effective control. Since it kills valuable grasses as well as noxious weeds/invasive plants, its use is very limited. Products containing the active ingredient glyphosate will be applied as a foliar spray using backpack sprayers, truck mounted spray tank with power hose and nozzle or by wick application to the foliage. Application is generally by wick and is used when other herbicides can not be used close to water.

Imazapyr (Trade name: *Arsenal* – PCP Act reg. no. 23713)

Imazapyr is a non-selective, post-emergent herbicide used all season to control annual and perennial broadleaf plants. It provides a wide spectrum of broadleaf control and has moderate soil residual activity. Products containing the active ingredient imazapyr will be applied as a foliar spray using backpack sprayers or truck mounted spray tank with power hose and nozzle.

Metsulfuron-methyl (Trade name: *Escort* – PCP Act reg. no. 23005)

Metsulfuron methyl is a selective, post-emergent herbicide used to control biennial, perennial and annual broadleaf noxious weeds/invasive plants as well as brush/woody plant species. It provides a wide spectrum of broadleaf control and has moderate soil residual activity. Products containing the active ingredient metsulfuron-methyl will be applied as a foliar spray using backpack sprayers or truck mounted spray tank with power hose and nozzle.

Picloram (Trade name: *Tordon 22K* – PCP Act reg. no. 9005)
(Trade name: *Grazon* – PCP Act reg. no. 26649)

Picloram is a selective, residual herbicide used for the control of a wide variety of noxious weeds/invasive plants. It can remain in the soil for several years and continue to control susceptible plants. Care must be taken to avoid areas where soil may be moved or where there are shallow aquifers or domestic water intakes and wells. The mode of action and soil persistence allow for a broader application window. Picloram is absorbed by foliage and roots and translocated. It is similar to 2,4-D but somewhat more active and acts as a growth regulator. Products containing the active ingredient picloram will be applied as a foliar spray using backpack sprayers or truck mounted spray tank with power hose and nozzle.

There is considerable research into chemicals for the control of weeds. Over time, there may be some chemicals that are withdrawn from use while new, reformulated or less toxic chemicals may become available. The RDNO will continually update information regarding chemicals for weed control and choose chemicals that are more effective, less toxic, new or reformulated, to achieve the desired control results.

Table 9

Pesticide Application Rates/Site Characteristics

Pesticide Trade Name (Active Ingredient)	Application Rate/ha *	Noxious Weed / Invasive Plant	Treatment Sites	Where cannot be used
2,4-D Amine 500 (2,4-D)	0.7 - 1.75 L	Burdock Bull Thistle Canada Thistle Hoary Cress Leafy Spurge	Broadleaf weeds	Arterial highways
Arsenal (Imazapyr)	3.0 L	Broadleaf invasive plants (non-selective)	For control of broadleaf weeds, perennial grasses and brush on non-crop lands	Near desirable plants or wet areas
Banvel II (Dicamba)	2.1 – 4.6 L	Most broadleaf invasive plants Diffuse Knapweed Russian Knapweed	For control of broadleaf weeds in cereal, corn, pastures and non-crop lands	Near desirable plants
Dycleer 24 (Dicamba & 2,4-D)	2.75 – 11.0 L		For control of broadleaf weeds on non-crop lands	Near desirable plants
Escort (Metsulfuron-methyl)	20 - 30 grams	Common Tansy Perennial Pepperweed Field Scabious Scentless Chamomile Canada Thistle	For control of brush woody species in pasture, and non-crop areas	All other species
Grazon (Picloram & 2,4-D)	3.8 - 7.0 L	Broadleaf invasive plants	For treatment on late flowering weeds	Some residue no coarse soils
Milestone (Aminopyralid)	0.3 - 0.5 L	Canada Thistle Common Tansy Knapweed Scentless Chamomile	Broadleaf weeds	
Roundup (Glyphosate)	0.75 – 2.5 kg wick application 33% solution	All plants (non selective)	All weeds on all soil types and under canopy Wick applied in riparian	Non selective so watch non-target plants

Pesticide Trade Name (Active Ingredient)	Application Rate/ha *	Noxious Weed / Invasive Plant	Treatment Sites	Where cannot be used
Tordon 22K (Picloram)	1.1 – 4.5 L	Scentsless Chamomile Diffuse Knapweed Spotted Knapweed Perennial Sowthistle Canada Thistle Russian Knapweed Leafy Spurge Dalmatian Toadflax Yellow Toadflax	Broadleaf weeds on medium to fine soils	Coarse textured soils or under canopy
Transline (Clopyralid)	0.42 - 0.83 L	Canada Thistle Scentsless Chamomile Perennial So thistle Ox-eye Daisy Spotted Knapweed Diffuse Knapweed	Compositae family On medium to fine soils	Coarse textured soils
Vanquish (Dicamba)	1.25 – 4.6 L	Canada Thistle Leafy Spurge Tansy Ragwort Diffuse Knapweed	Controls deciduous and coniferous brush species and broadleaf weeds in non-crop lands.	Near desirable plants
Vantage (Glyphosate)	0.75 - 2.25 L wick application 33% solution	All plants (non selective)	All weeds on all soil types and under canopy Wick applied in riparian	Non selective so watch non-target plants

* All of the above application rates will be cross-referenced to the recommended label rates schedule prior to herbicide application on a particular noxious weed/invasive plant species. Additional information about these products including their labels and material safety data sheets (MSDS) can be accessed at these websites:

PMRA	http://www.eddenet.pmra-arla.gc.ca/4.0/4.01.asp
Dow AgroSciences	http://www.dowagro.com/ca/labels/index.htm
Monsanto	http://www.monsanto.com/monsanto/layout/products/technicalandsafety/default.asp
True North	http://www.truenorthspecialty.com/english/landmtable.htm

2.5.4 Treatment Selection

NOXIOUS WEED/INVASIVE PLANT MANAGEMENT DECISION TREE

Treatment selection shall be based upon the following decision tree. The decision tree is designed as a general guideline for the many circumstances but recognizes that in site specific cases, judgment based on extenuating circumstances, may supersede the decision tree recommended treatment strategy.

- 1) Identification of Weed Species
 - a) Species is on either on the noxious weed/invasive plant list or weed alert bulletin **Go To 2)**
 - b) Species **not** listed *no action*

- 2) Species location
 - a) Species is found on RDNO owned/controlled land **Go To 3)**
 - b) Species is **not** found on RDNO owned/controlled land.....
..... *notify appropriate party*

- 3) Water Resources and Environmental Considerations
 - a) Species is found adjacent to or in an environmentally sensitive or riparian area, domestic water intake or well or PFZ
..... **Go To Table 10 - Treatment Methods EXCLUDING Chemical Control**
 - b) Species **not** found adjacent to or in an environmentally sensitive or riparian area, domestic water intake or well or PFZ..... **Go To 4)**

- 4) Soil
 - a) Coarse texture
..... **Go To Table 10 - Treatment Methods EXCLUDING Chemical Control**
 - b) Fine texture **Go To 5)**

- 5) Other Considerations
 - a) No other values require protection.....
..... **Go To Table 11 - Treatment Methods INCLUDING Chemical Control**
 - b) Other values require protection **Go To 6)**

- 6) *Once all concerns have been evaluated and weed species, site and soil types have been assessed, a final decision can be made on the most appropriate method of noxious weed/invasive plant control for the site.*

The decision tree identifies the strategic treatment options. The infestation site is then prioritized according to the Plant Category and Site Priority shown in Sec. 2.4, Table 7.

Table 10 Treatment Methods EXCLUDING Chemical Control

	Small (Individual plant to 0.5 hectares)	Medium (0.5 to 2 hectares)	Large (more than 2 hectares)
Limited Distribution (Codes 1, 2, 3, and 4)	1 – Digging and Hand Pulling 2 – Cutting/Mowing	1 – Digging and Hand Pulling 2 – Cutting/Mowing	1 – Cutting
Patchy Distribution (Codes 5 and 6)	1 – Digging and Hand Pulling 2 – Cutting/Mowing	1 – Biological 2 – Cutting/Mowing	1 – Biological
Continuous Distribution (Codes 7, 8 and 9)	1 – Biological 2 – Cutting/Mowing	1 – Biological or Manual	1 – Biological or Manual

Table 11 Treatment Methods INCLUDING Chemical Control

	Small (Individual plant to 0.5 hectares)	Medium (0.5 to 2 hectares)	Large (more than 2 hectares)
Limited Distribution (Codes 1, 2, 3, and 4)	1 – Digging and Hand Pulling 2 – Cutting/Mowing 3 - Chemical	1 – Digging and Hand Pulling 2 – Cutting/Mowing 3 - Chemical	1 – Cutting/Mowing 2 – Chemical
Patchy Distribution (Codes 5 and 6)	1 – Digging and Hand Pulling 2 – Cutting/Mowing 3 - Chemical	1 – Biological 2 – Cutting/Mowing 3 – Chemical	1 – Biological
Continuous Distribution (Codes 7, 8 and 9)	1 – Biological 2 – Cutting/Mowing 3 – Chemical	1 – Biological	1 – Biological

- Code 1** rare individual, a single occurrence
- Code 2** a few sporadically occurring individuals
- Code 3** a single patch or clump of a species
- Code 4** several sporadically occurring individuals
- Code 5** a few patches or clumps of a species
- Code 6** several well-spaced patches or clumps
- Code 7** continuous uniform occurrence of well-spaced individuals
- Code 8** continuous occurrence of a species with a few gaps in distribution
- Code 9** continuous dense occurrence of a species

2.5.5 Treatment Area Evaluation

Prior to treatment, sites are assessed for presence of noxious weeds/invasive plants and their impact to the site. Injury threshold is assessed by site susceptibility and size of current noxious weed/invasive plant population. Site treatment is prescribed based on the decision tree, Sec. 2.5.4, which takes into consideration site priority, noxious weed/invasive plant presence, size of infestation, soil type and location. If pesticides are going to be used, the following information will be provided:

- Location of the proposed pesticide use;
- Target species;
- Map of treatment area showing the location and distance to bodies of water, domestic and agricultural water sources, wells, sources of food for human consumptions and environmentally sensitive areas (eg. wildlife habitat areas, riparian areas);
- Location of residences and areas with human activities within 30 meters of proposed pesticide use. Residents to be advised of proposed treatment;
- Soil types and proposed PFZ from adjacent trees if products containing the active ingredient picloram are proposed for use;
- Location of all PFZ's, no treatment zones (NTZ's) and buffer zones that require flagging or staking prior to pesticide use; and,
- Signs posted at visible access points to the treatment areas as required by regulation.

Post treatment evaluation will normally occur within 14 days of application to determine the effectiveness of the treatment by the RDNO Coordinator. Key areas are selected within known treatment sites and are assessed for compliance with PMP, contract conditions, and label rates. Dyes may be used with pesticide treatment to aid in both the accuracy of treatment as well as post evaluation. Evaluation consists of pesticide efficacy, plants missed, use of flagging near riparian areas, and target species treated. For mechanical treatment, sites are assessed for possible re-growth and need for a second treatment. When evaluating the results of both chemical and non-chemical controls, RDNO staff shall consider the following:

- Whether the targeted noxious weeds/invasive plants were affected by the control option chosen;
- Whether the level of control is acceptable;
- Whether the treatment method used was effective;
- Whether environmentally sensitive areas were adequately protected;
- Whether pesticide application rate needs to be adjusted;
- Whether there was any observable off-site pesticide movement or impact on surrounding areas; and,
- Whether the established PFZ's, NTZ's and buffer zones were appropriate for the treatment method.

Biological control will be evaluated for agent establishment within 2 years after a release is made. Once establishment is verified on a site, assessment of dispersal and efficacy of the agent is also assessed.

2.5.6 Specific Treatment Options by Weed Species

Several treatment options are often available to control noxious weeds/invasive plants. The following specific recommendations give some examples of control options that the RDNO may consider for the control of weeds of most concern within the RDNO:

Burdock – Mowing after the plant has bolted but before it has flowered can be used to eliminate seed production. 2,4-D, picloram and glyphosate are effective when applied to first-year rosettes. There are currently no biological control agents available for common burdock control.

Dalmatian toadflax – Hand-pulling before seed-set each year can be an effective management method for small infestations. Cutting the plants will reduce top growth seed production but will not kill the plant. Fall applications of picloram or a mixture of picloram and 2,4-D may give effective control. Several biological control agents are currently available for dalmatian toadflax control.

Diffuse knapweed – Cutting or mowing before seed-set can be effective to reduce seed production, but will not eliminate large infestations. Mowing should be followed by a fall pesticide treatment. Hand-pulling can be effective in small infestations, but usually needs to be repeated. Aminopyralid, picloram, 2,4-D, clopyralid or a mixture of picloram and 2,4-D are effective for diffuse knapweed control. Pesticides should be applied before plants set seed, or applied to rosettes in the fall for maximum effectiveness. There are many biological control agents for the control of diffuse knapweed.

Hoary Cress – Due to the rhizomes of this perennial weed, mechanical control provides minimal control. Digging can provide control of very small infestations. Hand-pulling of above ground plant parts is ineffective. Effective chemical control requires multiple applications. Glyphosate can control hoary cress however it will injure and kill perennial grasses. Metsulfuron-methyl can be effective if combined with an agricultural surfactant. The optimum time to apply Metsulfuron-methyl is in the spring when it is flowering or in the fall. There are currently no biological control agents available for hoary cress.

Hound's-tongue – Hand-pulling small infestations and mowing plants before seed-set reduces the seed production and may kill the plant. Picloram or a mixture of picloram and 2,4-D can be used for long term control if applied in the spring, summer or fall. Glyphosate is also effective in controlling actively growing plants. Biological control agents are currently available for hound's-tongue control.

Leafy spurge – Mechanical and manual methods are generally ineffective because of the plant's extensive root system. Picloram alone has been used successfully on small infestations. A combination of picloram and 2,4-D are effective if applied before flowers emerge in the spring. Dicamba plus 2,4-D are also effective in managing leafy spurge. Glyphosate can be effective when applied at one-month intervals followed by fall grass seeding. Several biological control agents are currently available for leafy spurge control.

Orange hawkweed – Hand-pulling small infestations can be effective if the roots and stolons are not scattered. Mowing can prevent seed production but will encourage new growth. Picloram or picloram and 2,4-D provide good control when applied to actively growing plants in spring and early summer. There are currently no biological control agents available for orange hawkweed control.

Oxeye daisy – Hand-pulling and digging before seed production can be effective if most of the underground parts of the plant are removed. Picloram, a mixture of picloram and 2,4-D, metsulfuron-methyl and glyphosate give effective control. There are currently no biological control agents available for oxeye daisy control.

Rush skeletonweed – Hand pulling can be an effective treatment if repeated because of the plant's extensive root system. Mowing is ineffective at controlling rush skeletonweed. Pesticide applications should be applied after the plant has bolted but before seed set. Picloram can be effective if applied to rosettes. There are several biological control agents that may be effective in distorting the growth of rush skeletonweed.

Scentless chamomile – Seed production is reduced if plants are mowed before they flower. Scentless chamomile produces new flowers below the normal mower cutting height so to be effective mowing must be done early and often. Picloram and aminopyralid have been shown to be effective if applied early in the season before flowering. There are currently no biological control agents available for oxeye daisy control.

Spotted knapweed – Cutting, mowing or pulling before the plant sets seed can be effective on small infestations. The entire root system should be removed so that the plant will not resprout from the crown or remaining roots. Aminopyralid, picloram, a mixture of picloram and 2,4-D, 2,4-D alone, clopyralid and glyphosate are effective in controlling spotted knapweed. Pesticides should be applied before the mature plants set seed for maximum effectiveness. There are many biological control agents for managing knapweed.

Sulphur cinquefoil – Small infestations can be controlled by hand-digging. Picloram, a mixture of picloram and 2,4-D, clopyralid and 2,4-D are effective in controlling sulphur cinquefoil. There are currently no biological control agents for sulphur cinquefoil.

Thistle – Root starvation is the key to controlling thistle. If thistle occurs in small distinct patches, then the spots may be sprayed and monitored. Pesticides should be applied when the greatest number of thistle shoots has emerged. No single pesticide treatment or other control procedure will consistently eliminate or provide long-term control. Several biological control agents are currently available for thistle control.

2.6 INTERAGENCY NOXIOUS WEED/INVASIVE PLANT PLANNING

Within the PMP area noxious weed/invasive plant planning occurs in a coordinated basis. Invasive Plant Committee meetings form the basis of review for prioritization and treatment of noxious weeds/invasive plants. The following agencies and groups meet periodically to plan noxious weed/invasive plant containment within their respective jurisdictions. The RDNO Invasive Plant Committee generally meets twice annually to discuss the noxious weed/invasive plant control program for that season.

*Township of Spallumcheen

*Ministry of Agriculture

*Ministry of Transportation

*Okanagan Indian Band

*Spallumcheen Indian Band

*Okanagan Shuswap Forest District (Range program)

Ministry of Forests and Range - Southern Interior Region

Columbia Shuswap Regional District

Thompson Nicola Regional District

Central Okanagan Regional District

B.C. Cattleman's Association

Kelowna Pacific Railway

Okanagan Valley Railway

B.C. Transmission Corp.

Terasen Gas

B.C. Parks

North Okanagan Naturalists

City of Vernon

*agencies with representatives on the RDNO Invasive Plant Committee

3.0 PESTICIDE APPLICATION AND OPERATIONAL PRACTICES

The treatment of noxious weeds/invasive plants within the PMP area is performed by seasonal staff and/or contractors with valid service licenses to conduct noxious weed/invasive plant control treatment.

The transportation, storage, handling, application and disposal of pesticides are governed by Federal and Provincial legislation. All staff and contractors working with pesticides will follow safe handling practices including workplace requirements for Workplace Hazardous Materials Information System (WHMIS) labeling and worker education, and in compliance with Division 7 of the IVMR. The required practices for pesticide applicators are detailed in:

- Workers' Compensation Board of British Columbia (1998) *Occupational Health and Safety Regulation – BC Regulation 96/97 as amended by BC Regulation 185/99 – Sections 6.70 to 6.109*;
- *Integrated Pest Management Act & Regulations (IPMA & IPMR)*;
- B.C. Ministry of Environment (2005) Handbook for Pesticide Applicators and Dispensers;
- B.C. Ministry of Forests and Range (FRDA 006) Herbicide Field Handbook; and,
- Workers' Compensation Board of British Columbia (1990) Standard Practices for Pesticide Applicators.

3.1 QUALIFICATIONS AND RESPONSIBILITIES OF PERSONS APPLYING PESTICIDES

The Invasive Plants and Insects Coordinator, employed by the RDNO to manage the noxious weed/invasive plant control program, is responsible for the development of the PMP.

All pesticide applications will be conducted or supervised by a person who holds a valid Pesticide Applicator Certificate endorsed for the class of pesticide and the pesticide use required for this PMP. The responsibilities of the Certified Pesticide Applicator are to:

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

All seasonal staff applicators must attend RDNO in-house training and discussion sessions.

3.2 PROCEDURES FOR SAFELY TRANSPORTING PESTICIDES

The federal *Transport of Dangerous Goods Act (TGA)* regulates the handling and transportation of poisonous substances which include pesticides. The IPMA and IPMR also specifies certain transport procedures. The following procedures will be followed with respect to the transport of pesticides as part of the noxious weed/invasive plant control program within the RDNO:

- The amount of pesticide carried in any one vehicle will be no more than what is necessary for each project, except where transportation occurs between storage facilities;
- Pesticides will be carried in a secure lockable compartment;
- Pesticide containers will be inspected for defects prior to transporting and will only be transported in original labeled container or containers that have the label

- displayed with the trade name, active ingredient, concentration of amount and PCP #;
- Pesticide will be carried separately from food and drinking water, safety gear and people;
- Spill containment and clean up equipment will be transported separately from pesticides but in close proximity to the pesticide on each vehicle during transportation and use of pesticides;
- Appropriate documents such as operational records, material safety data sheets and the PMP document will be carried in each vehicle during pesticide use and transportation,
- Ensure that all documents and placards are carried in, or placed on, transport vehicles if required under the TGA, the IPMA or the IPMR; and,
- Ensure that the vehicle is equipped with a first aid kit, fire extinguisher, spill contingency plan and kit, and the vehicle operator has been trained on how to handle spills.

3.3 PROCEDURES FOR SAFELY STORING PESTICIDES

Pesticides will be stored in accordance with the IPMA, IPMR and the Workers' Compensation Board document titled Standard Practices for Pesticide Applicators at a RDNO compound. The RDNO will comply with the following procedures for safely storing pesticides:

- Ensure that storage facilities are locked when left unattended, ventilated to the outside atmosphere, are entered only by persons authorized to do so and have a placard affixed and maintained on the outside of each door leading into the pesticide storage area bearing, in block letters that are clearly visible, the words **“WARNING – CHEMICAL STORAGE – AUTHORIZED PERSONS ONLY”**;
- Keep pesticides in their original containers and with original packaging. If the original containers are not available, the pesticides will be placed in containers that have the label displayed with the trade name, active ingredient, concentration of amount and PCP #;
- Keep storage facilities separate from work and living areas, and away from food, flammable materials, bodies of water and water sources;
- The person responsible for the storage area will notify the appropriate fire department of the presence of the pesticide on the premise; and,
- When a vehicle is considered a mobile storage unit, the pesticide will be stored in a locked canopy or compartment separate from the passenger area and personal protective equipment.

3.4 PROCEDURES FOR SAFELY MIXING, LOADING AND APPLYING PESTICIDES

Mixing, loading and application of pesticides will be carried out by certified pesticide applicators in the appropriate category of certification, or by individuals directly supervised by a certified pesticide applicator in the appropriate category of certification.

The RDNO will comply with the following procedures while mixing, loading and applying pesticides:

- Mixing of pesticides will be conducted in a safe manner;
- Ensure that containers used to mix, prepare, or apply pesticides are not washed or submerged in any body of water;
- Ensure that eye wash station(s), personal protective equipment, safety spill kits, spill response plans, a copy of this PMP, each pesticide product's Material Safety Data Sheet (MSDS) and first aid supplies will be present on site;
- Adhere to the recommended re-entry times to treat areas unless personal protective equipment is worn; and,
- No mixing or loading of pesticides within 15 meters of PFZ's, NTZ's, bodies of water, fish or wildlife habitat, water sources or other sensitive environmental features.

3.5 PROCEDURES FOR SAFE DISPOSAL OF EMPTY PESTICIDE CONTAINERS AND UNUSED PESTICIDES

The responsibility of container disposal associated with the noxious weed/invasive plant control program lies with staff or the contractor, as the case may be. Disposal of empty pesticide containers will be according to the manufacturer's instructions as noted on the product label or provincial instructions and recommendations that are detailed in the B.C. Ministry of Environment Handbook for Pesticide Applicators and Dispensers. The RDNO will adhere to the following procedures for safely disposing of empty pesticide containers and unused pesticides:

- Empty containers will be triple rinsed, punctured so they are not re-useable, and disposed of at appropriate landfill sites or returned to the pesticide distributor as part of their recycling program; and,
- Any unused chemical will be stored at a RDNO chemical storage facility in the original container for future use.

3.6 PESTICIDE SPILL RESPONSE PLAN

A pesticide spill kit on all vehicles used in noxious weed/invasive plant control shall contain as a minimum, the following articles:

- Instructions for spills;
- Emergency Telephone Numbers;
- Agricultural white lime;
- Kitty litter;
- Large plastic garbage bags;
- Shovels;
- Nutrasol;
- ABC Type Fire Extinguisher;
- Polyethylene or plastic tarp (10'X10' minimum);
- Dustpan and shop brush;

- Flagging tape and Rope;
- First Aid kit; and,
- Personal Protective Safety gear (long-sleeved shirts, long pants, boots, gloves, safety glasses, etc.).

A copy of the spill response plan will be at or near each work site. All staff working with pesticides will be familiar with this spill response plan. All contractors that work under this PMP must have their own spill response plan and it must meet or exceed the contents of this PMP.

The following procedures will be followed if a spill occurs:

- All personnel shall be protected from pesticide contamination by wearing appropriate protective clothing and safety gear;
- Move any exposed person away from the place of the spill and keep the person warm;
- Provide first aid if necessary;
- Stop the source of the spill;
- Create a dam or ridge to stop the spilled material from spreading;
- Inform the project supervisor of the spill;
- The project supervisor will ensure all personnel working on the project are aware a spill has occurred and the cleanup procedures have commenced;
- The project supervisor will ensure operations cease until the spill is contained and the source is repaired;
- Absorbent material will be spread over the spill, if applicable, to absorb any liquid;
- The absorbent material will be collected in garbage bags or containers with contents clearly marked;
- Any contaminated soil or material from the spill site will be collected in garbage bags or containers and removed from the spill site;
- The project supervisor will contact the RDNO for shipping instructions and disposal requirements; when more than 1 liter of pesticide is spilled, the project supervisor will immediately report the spill to the Provincial Emergency Program by telephoning **1-800-663-3456** or, where that is not practical, to the local police or the nearest detachment of the RCMP; and,
- The project supervisor will notify the RDNO of the details related to the spill as soon as practical.

3.7 BOUNDARY MARKING PROCEDURES

All pesticide treatment of noxious weeds/invasive plants within the PMP area will be outlined on the annual treatment records indicating site and treatment. Each individual site is identified providing accurate location and recording of treatments. Signage will be placed at the start and end of treatment on all public areas where the public is likely to go. When treatment occurs within recreational sites, signage will be placed at all entrances to the site. Applicators will also mark PFZ's around surface water, wells, domestic water intakes, and any other areas where PFZ's must be maintained.

4.0 ENVIRONMENTAL PROTECTION STRATEGIES AND PROCEDURES

The IPMA and IPMR require a description of the environmental protection strategies and procedures that will be followed under this plan, including a description of the following strategies and procedures:

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

4.1 STRATEGIES TO PROTECT COMMUNITY WATERSHEDS

The RDNO PMP will abide by the following strategies to protect community watersheds:

- Prior to pesticide use, all water licensees within 100 meters of proposed pesticide use will be notified;
- Prior to the use of pesticides, community watersheds shall be identified to determine if pesticide treatments are within a community watershed or are within 100 meters upslope of any water intake;
- A 100 meter NTZ will be maintained upslope from the point of pesticide application and all licensed water intakes within the community watershed;
- Pesticides will not be stored within a community watershed for more than 24 hours prior to their use, and removed from the community watershed within 7 days of their use, unless they are stored in a permanent structure;
- A 10 meter PFZ will be maintained from point of pesticide application and all bodies of water within the community watershed;
- A 30 meter PFZ will be maintained down slope from point of pesticide application and all licensed water intakes within a community watershed;
- All PFZ's will be measured and marked/flagged prior to pesticide application; and
- Pesticide use will be discontinued if pesticide residues or pesticide breakdown products are detected in a community watershed water intake, and further use will not be undertaken until the Ministry of Health has been satisfied that all required measures have been implemented to preserve water quality.

4.2 STRATEGIES TO PROTECT DOMESTIC AND AGRICULTURAL WATER SOURCES

The following table describes the minimum water protection measures that will be implemented for pesticide application under this PMP. The PFZ's and NTZ's in this table are consistent with the standards specified in the *Integrated Pest Management Regulation* (IPMR) for noxious weed and invasive plant control.

Table 12 Water Protection Measures

Uses	Permitted Application	NTZ/PFZ	Exceptions
All Pesticides	Around water supply intakes or wells used for domestic or agricultural purposes.	30 m NTZ	NTZ may be reduced if reasonably satisfied that a smaller NTZ will ensure no pesticide enters well or intake.
All Pesticides except Glyphosate	Around or along a body of water, dry stream and classified wetland.	10 m PFZ Measured from the high water mark. NTZ (sufficient buffer to maintain PFZ)	
Glyphosate applications to other industrial sites that must be free of vegetation or Glyphosate applications using selective application methods along a right-of-way.	Along or around a body of water or classified wetland that: <ul style="list-style-type: none"> • is fish bearing; or, • drains directly into a fish bearing body of water; or, Along or around a dry stream that when wet: <ul style="list-style-type: none"> • is fish bearing or drains directly into a fish bearing body of water. 	2 m PFZ	
Glyphosate applications for all uses, including utility right-of-way, pipelines, highways, and treatment of up to 50 ha of public land for noxious weeds or invasive plants.	Along or around a body of water or classified wetland that: <ul style="list-style-type: none"> • is fish bearing; or, • drains directly into a fish bearing body of water; or, Along or around a dry stream that when wet: <ul style="list-style-type: none"> • is fish bearing or drains directly into a fish bearing body of water. 	5 m PFZ	Industrial site that must be free of vegetation. Selective treatment of noxious weeds and invasive plants.
Glyphosate applications for all uses, including utility right-of-way, pipelines, highways, and treatment of up to 50 ha of public land for noxious weeds or invasive plants.	Along or around a permanent body of water that: <ul style="list-style-type: none"> • is not fish bearing at any time of the year; and, • does not drain directly into fish bearing water. 	2 m NTZ	Selective treatment of noxious weeds and invasive plants.
Glyphosate applications for all uses, including utility right-of-way, pipelines, highways, and treatment of up to 50 ha of public land for noxious weeds or invasive plants.	Up to but not below the high water mark of temporary free standing bodies of water and over dry streams that: <ul style="list-style-type: none"> • are not fish bearing at any time of the year; and, • do not drain directly into fish bearing water. 	0 m NTZ for temporary free standing bodies of water. Overspray dry streams	
All Pesticides used for noxious weeds and invasive plant management	Selective application to a noxious weed or invasive plant and to the ground surrounding the plant within 1.5 m.	1 m PFZ if used between 1 m and 10 m above the high water mark.	Reasonable efforts must be made to protect any biological weed control organisms in the area.

“Pesticide Free Zone” (PFZ) – means an area of land, measured in meters, that must not be treated with pesticide and must be protected from pesticide moving into it via drift, runoff or leaching.

“No Treatment Zone” (NTZ) – means an area of land that must not be treated with pesticide. NTZs will be identified and marked prior to any pesticide application.

4.3 STRATEGIES TO PROTECT FISH AND WILDLIFE, RIPARIAN AREAS AND WILDLIFE HABITAT

The PFZ’s and NTZ’s specified in Sec. 4.2, Table 12 will provide protection for bodies of water, fish and wildlife.

To prevent contamination of water in fish bearing streams, pesticides will not be applied to ditches that flow directly or indirectly into fish bearing streams.

The *Species at Risk Act* and *BC Wildlife Act* will be adhered to. Known locations of species at risk will be obtained from the Conservation Data Center.

4.3.1 Strategies to Protect Riparian Areas

Prior to noxious weed/invasive plant control methods being implemented in riparian areas, the following shall be confirmed:

- Location of all bodies of water;
- Classification of all bodies of water as fish bearing or not fish bearing, if unknown will default to fish stream;
- The boundaries of any required PFZ and NTZ;
- No pesticide mixing or cleanup or disposal of pesticide materials within 15 meters of riparian zones; and,
- The most appropriate method of vegetation management.

4.3.2 Strategies to Protect Wildlife Habitat

To protect wildlife and their habitat, the following strategies will be implemented:

- Low-growing shrubs and plants that are important winter browse species for wildlife will not be treated with pesticides or by non-chemical methods;
- PFZ’s will be established and maintained around inhabited raptor and heron nests, wildlife trees and mineral licks during pest management activities;
- To minimize soil disturbance as much as possible; and,
- Mechanical, manual and biological control will be used where there is a significant risk of harming vulnerable plant or animal species.

4.4 STRATEGIES TO PREVENT CONTAMINATION OF FOOD INTENDED FOR HUMAN CONSUMPTION

RDNO staff will attempt to locate areas where there is crop food intended for human consumption and take the appropriate precautions during vegetation management operations to avoid contamination of these sites.

High value berry producing plants that have the potential to or are known to be consumed or collected by humans and other important native plant species will not be targeted for pesticide treatment. First Nations or other members of the public may identify these sites during higher level planning, consultation or referral. The RDNO will not knowingly apply pesticide, or allow pesticides to drift, onto berries or edible plants. There will be no pesticide applied within 10 meters of berries from the time the flowers open until the most berries have dropped from the plant.

Selective application of glyphosate may be applied within 1 meter of agricultural land which is actively utilized by livestock or actively producing crops. Other pesticides approved under this PMP will be applied as per label recommendations in areas actively producing crops or that are grazed by cattle.

The RDNO will identify and record the location of areas where food intended for human consumption is grown. These areas will be recorded on the Pesticide Inspection Report and Checklist.

The RDNO has established and maintains a Pesticide-Free Zone Registry which identifies the locations of properties where the landowners do not wish pesticides to be applied. A 10 meter pesticide-free zone will be maintained around these properties. This registry is intended to minimize the likelihood of pesticide contamination of food intended for human consumption and to protect organic farmers and beekeepers.

4.5 PRE-TREATMENT INSPECTION PROCEDURES FOR IDENTIFYING TREATMENT AREA BOUNDARIES

RDNO staff will complete the Pesticide Inspection Report and Checklist shown in Appendix 3. This form requires observing and recording the location and distance to bodies of water, domestic and agricultural water sources, wells, sources of food for human consumption and environmentally sensitive areas. Signs will also be posted at visible access points to the treatment areas as required in the IPMA and IPMR. The proposed location of all PFZ's and buffer zones will be flagged or staked prior to pesticide application.

4.6 PROCEDURES FOR MAINTAINING AND CALIBRATION OF PESTICIDE APPLICATION EQUIPMENT

All pesticide application equipment used by RDNO staff will be safe, clean, in good repair, compatible and appropriate for the pesticide being used. All sprayers will be calibrated, using the form shown in Appendix 4, on a regular basis throughout the spray

season to ensure that the equipment is being operated in accordance with the pesticide product application rate.

The following will be undertaken to ensure that the equipment is functioning as intended:

- Sprayers will be assigned to specific operators;
- Sprayers will be recalibrated if a different applicator uses the sprayer for the day;
- Sprayer fittings and hoses will be checked each day for leaks and signs of wear prior to use;
- Sprayers will be calibrated prior to each spray season and on a monthly basis;
- Calibration test forms will be completed for each pesticide product that will be applied; and
- At the beginning of each spray season, the RDNO will inspect equipment, safety gear, spray vehicles, spill kits, and related equipment, and conduct a calibration test with all applicators.

4.7 PROCEDURES FOR MONITORING WEATHER CONDITIONS AND STRATEGIES FOR MODIFYING PESTICIDE APPLICATION METHODS FOR DIFFERENT WEATHER CONDITIONS

Measurements will be made to record weather conditions prior to and periodically during all pesticide applications. Precipitation, temperature, wind speed and direction, and sky conditions will be recorded. Local weather forecasts and predictions will be monitored through Environment Canada and every effort will be made to ensure that weather conditions are suitable for pesticide application as specified on the product label.

Pesticide applications will not occur if any of the following apply:

- The maximum/minimum temperature specified on the pesticide product label is exceeded;
- It begins to rain steadily, increasing the chances of leaching and excessive runoff;
- Wind speed and direction cause the application of pesticide to drift and/or miss the target vegetation;
- Ground wind velocity exceeds 8 km/hour;
- If foliage is covered with frost or ice; or,
- If water is flowing on the foliage.

5.0 REPORTING

The RDNO and the Administrator, IPMA, rely on accurate record keeping to monitor the quantity of pesticides used. Accurate records also ensure compliance with the IPMA and IPMR, the commitments made in this PMP and the Pesticide Use Notice. The RDNO will ensure that each of the following are maintained or provided.

5.1 CONFIRMATION HOLDER USE RECORDS

Section 37(1) of the IPMR describes the requirements for these records as follows:

37 (1) *A confirmation holder who uses a pesticide or authorizes the use of a pesticide, other than a wood preservative, must keep a record containing the following information for each treatment location and day of use:*

- a) the name and address of the owner or manager of the treatment location;*
- b) if the use was performed as a service, the name and licence number of the licensee who performed the service;*
- c) if the use was not performed as a service, the name and certificate number of the certified applicator who used the pesticide or supervised the use;*
- d) if a permit was required for the use or the class of pesticide, the permit number;*
- e) the information required under section 35 (1)(e) to (i), (k) and (1) and (2);*

(2) *A confirmation holder must keep a record for each piece of the holder's pesticide application equipment that requires calibration showing when the equipment was calibrated and the data upon which its calibration was based.*

Section 35 (1) further requires:

- e) the date and time of the pesticide use;*
- f) the name of the pest targeted by the use or the purpose of the pesticide use;*
- g) the trade name of each pesticide used and its registration number under the federal Act;*
- h) for each pesticide used, the method and rate of application and the total quantity used;*
- i) if the use was outdoors, the prevailing meteorological conditions including temperature, precipitation and velocity and direction of the wind;*
- k) advise given to the owner or manager of the treatment area in relation to the following:*
 - i) safe re-entry time;*
 - ii) the number of days before a crop can be harvested safely;*
 - iii) additional precautions that should be taken to minimize exposure to the pesticide;*
- l) if the licensee decided under section 71 (4) [use requirements-licensee and confirmation holder] that a no-treatment zone may be reduced, the information on which the licensee based the decision.*

(2) *A licensee who performs a use described in section 5 (1)(g) [pesticide uses requiring a licence] on more than 20 ha a year managed by a single entity must also keep records of each of the following for each treatment location:*

- a) the results of pest monitoring carried out by the licensee in relation to*
 - i) the pest population, and*
 - ii) the damage caused by pests;*
- b) the use of the monitoring results described in paragraph (a) to determine injury thresholds;*
- c) how public notification was given and where notices were posted;*
- d) the effectiveness and impacts of the pesticide use.*

5.2 REQUESTS TO AMEND THE PMP

The RDNO will forward to the MOE in writing, amendments requested for the PMP. Amendment requests to add new application techniques or similar changes will not require further public advertising or First Nations consultation, provided that the amendment request is within the RDNO PMP area. Amendments to add new active ingredients may require further public advertising and/or First Nations consultation at the discretion of the Administrator, IPMA.

5.3 ANNUAL SUMMARY OF PESTICIDE USE

In accordance with Sec. 39 of the IPMR, the RDNO will provide to the Administrator, IPMA, the following information for a calendar year by January 31 in the next calendar year for operations conducted under this PMP during the calendar year:

- Name and address of the confirmation holder, and confirmation number;
- Pesticide trade name including active ingredient and P.C.P. number;
- Amount of kilograms used and total area treated;
- Methods used to apply pesticides;
- Methods of non-pesticide pest controls used and estimated area treated; and,
- A description of the treatment area and map identifying its gross boundaries.

6.0 NOTIFICATION

The RDNO will provide the following notifications with respect to this PMP:

6.1 NOTIFICATION OF PMP CONFIRMATION

Within 7 days of the PMP confirmation date, the RDNO will make available, for the term of the confirmation, a copy of the confirmation and the PMP with relevant maps at the RDNO office to allow inspection by the public.

6.2 ANNUAL NOTICE OF INTENT TO TREAT

At least 21 days prior to treatment in each year during which the PMP is in effect, an Annual Notice of Intent to Treat (NIT) for the following year will be sent, in writing, to the Administrator, IPMA. This NIT will identify areas scheduled for treatment.

6.3 TREATMENT NOTICE

A treatment notice will be posted on public land prior to implementing vegetation management treatments using pesticides. The signage will be clearly visible and legible for public approaching the treatment area. The number of signs posted at each site will be determined by factors including the length of the treatment site, access points, residential density and public buildings. Signs will normally be placed immediately along the highway or road prior to the start of spray operations at the point of

commencement, and then in key locations along the spray route including official rest stops, school bus stops, rural mailbox sites and major official lookout points. If these key locations are not present, then one sign will be posted every 15 kilometers.

Signs will also be posted in areas where the public may generally be expected to enter, walk, or stop and at access points on primary roads. For corridor treatments, postings will be done along the edge of the corridor where the treatment begins and where it ends, and on fenced facilities where the sign may be placed on the located gate. Signs should remain posted for a minimum of 14 days post-treatment.

Pesticide treatment notice signs will specify:

- Title – “**NOTICE OF HERBICIDE USE**”;
- Proposed date and start time of application;
- Name of target pest;
- Confirmation (PMP) Number;
- Pesticide active ingredient name and *Pest Control Product Act* Registration Number (P.C.P.);
- Phone number at which a licensee or proponent can be reached for further information about the pesticides used; and,
- Precautions that can be taken to minimize exposure to people entering the treatment area.

7.0 CONSULTATION

Prior to submitting the final PMP to the MOE for confirmation, the RDNO will publish 2 Notices of Intent to Develop a Pest Management Plan in local newspapers. The consultation process will be carried out with the public, First Nations and representatives of the Regional Pesticide Review Committee. The objectives of conducting a draft PMP consultation are:

- To increase public and First Nations awareness of the PMP process
- To increase public and First Nations awareness of the principles of IPM;
- To ensure that the public and First Nations have an opportunity to identify concerns;
- To allow the RDNO to address concerns, before the PMP is finalized and submitted to the MOE for confirmation;
- To ensure a transparent and accountable review process for the PMP;
- To educate the public and First Nations on the need to manage noxious weeds and invasive plants; and,
- To explain how the the PMP recognizes the need to protect human health and the environment.

7.1 PUBLIC CONSULTATION PLAN

The RDNO will encourage public input into the draft PMP. To engage the public in providing input into this PMP, the following steps will occur:

- Develop for review and comment a draft PMP that includes related government and RDNO policy, procedure, standards and information;
- Develop for review and comment a draft PMP that incorporates the principles of IPM as the basis for decision-making options; and,
- Publish advertisements in newspapers advising the public of the PMP, and inviting their comments.

Section 61 of the IPMR requires that:

(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 cm² in size, that must be published in a 2 week period in a newspaper circulated in the communities described in paragraph (e) and, if no newspaper is circulated in those communities, in the 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) a 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.

(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 those individuals.

7.2 PUBLIC CONSULTATION REPORT

The RDNO will prepare and maintain a Consultation Report that contains:

- A summary of written and verbal responses by the public, including the names and addresses of those who provided input, the nature of their concerns and/or recommendations, and a summary of written and verbal responses by the RDNO to the input from the public;
- Any agreement made to an individual or group stating notification before pesticide use; and,
- A list of newspapers in which notification of the draft PMP submission appeared, along with the publication dates and a photocopy of the advertisements.

7.3 FIRST NATION CONSULTATION

In addition to the objectives for public consultation outlined above, the RDNO will consult with First Nations to avoid infringement on aboriginal rights, treaty rights or cultural values during the implementation of this PMP. First Nation consultation will follow policy and procedures provided by the MOE in the Draft Guidelines for First Nation Consultation. Results of the consultation process with First Nations and the RDNO will be documented and available for review in the Consultation Report.

7.4 CONSULTATION WITH REGIONAL PESTICIDE REVIEW COMMITTEE (RPRC)

The Regional Pesticide Review Committee is comprised of representatives from the Ministries of Agriculture, Environment, Health, and Forests and Range. Members of the committee have been given an opportunity to review and comment on the draft Pest Management Plan to ensure that treatment proposals will not cause unreasonable adverse effects to the environment or human health.

8.0 REFERENCES

- Integrated Pest Management Act, IPMA
- Integrated Pest Management Regulations, IPMR
- Integrated Vegetation Management Association of B.C., Explanatory Notes for IPMR
- Pesticide Fact Sheets and Material Safety Data Sheets
- Field Guide to Noxious Weeds and Other Selected Invasive Plants of British Columbia
- Ministry of Forests and Range, Invasive Alien Plant Program
- Pest Management Plans:
 - Ministry of Transportation, Integrated Pest Management Plan, Southern Interior Region
 - Pest Management Plan for the Southern Interior Forest Region Invasive Alien Plants
 - Thompson Nicola Regional District, Invasive Plant Pest Management Plan

**REGIONAL DISTRICT
OF
NORTH OKANAGAN**



**Pest Management Plan
Noxious Weeds – Invasive Plants**

APPENDICES

APPENDIX 1

Map

APPENDIX 2

Legislation

REGIONAL DISTRICT OF NORTH OKANAGAN



LEGISLATION

FEDERAL LEGISLATION

Canada Seed Act provides guidelines for the content of noxious weed seeds in crop seed, and transportation of crop seed in Canada.

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 humans will consume livestock.

Indian Act the council of the band can provide bylaws related to the destruction and control of all noxious weeds. Sec 81 (j) of the Act.

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

Pesticide Control Products Act summarizes the registration and availability of pesticides and prohibits application under unsafe conditions.

Pesticide Residue Compensation Act details possible compensation for farmers whose crops have been seized by the Health Protection Branch.

Transportation of Dangerous Goods Act provides information regarding the storage and transportation of pesticides (and other dangerous goods).

Plant Protection Act describes the requirements for the introduction of biocontrol agents into Canada.

Waste Management Act outlines procedures for the disposal of pesticide wastes.

PROVINCIAL LEGISLATION

Environmental Management Act (Bill 57-2003) prohibits the introduction of wastes into the environment without a permit or approval of compliance. The legislation regulates activities such as transportation and storage of wastes, disposal of unused petroleum or herbicide products, empty petroleum or herbicide containers and herbicide contaminated rinse water.

Transportation Act includes all public streets, roads, ways, lanes, bridges, trestles, ferry landings and approaches, and any other public ways. All roads, other than private roads, are deemed to be common and public highways subject to Section 4(3).

Fish Protection outlines the obligations to protect and restore fish habitat.

Weed Control Act outlines the obligation to control designated invasive plants by the land occupier.

Wildlife Act establishes criteria for the protection of wildlife and wildlife habitat.

Workers Compensation Act enforces the Industrial Health and Safety Regulations when carrying out herbicide applications and other vegetation management activities on MoT highway rights-of-way.

Transportation of Dangerous Goods Act sets out regulations and standards for the movement of dangerous goods within the province.

Integrated Pest Management Act & Regulation prohibits the application of pesticides, including herbicides, on Crown or public land except under an authorization of a Pesticide Use Permit or a confirmation of a Pest Management Plan from the PMP holder. The legislation regulates the handling, storage, disposal, and sale of pesticides. The Ministry of Environment administers the Act and supporting regulations from regional offices within the province. Pest Management Plans are developed by the proponent following mandatory legislated standards.

Environmental Appeal Board Procedure Regulation governs the process for appeals of pesticide use permits and pest management plans.

Forest and Range Practices Act requires measures to prevent the introduction or spread of prescribed species of invasive plants.

Forest Act and **Ministry of Forests Act** authorize the MOFR to control pests.

Other provincial and federal legislation includes:

- *Plant Protection Act*

APPENDIX 3

Pesticide Inspection Report and Checklist

REGIONAL DISTRICT OF NORTH OKANAGAN



PESTICIDE INSPECTION REPORT AND CHECKLIST

Location of Proposed Treatment _____

Target Invasive Plant Species _____

** Applicator Check Here When Complete*

- _____ 1. Map or diagram of proposed treatment site completed with the required information.
- _____ 2. Signs posted at visible access points to the treatment areas prior to herbicide use.
- _____ 3. If appropriate, residents within 30 meters of the proposed treatment areas have been contacted and “door knockers” left if no one is home.
- _____ 4. When using products containing the active ingredient picloram, a PFZ has been established from the tree stem to the drip line of the tree crown, plus a 2.5 meter buffer zone where necessary to protect the roots that may extend beyond the drip line.
- _____ 5. When using products containing the active ingredient picloram, the required soil assessment has been completed to ensure compliance with label requirements.
- _____ 6. All PFZs and buffer zones have been flagged or staked prior to herbicide use, including tree buffers.
- _____ 7. All water licensees within 100 meters of proposed herbicide use have been identified and notified.

CREW SUPERVISOR: _____

DATE OF REPORT COMPLETION: _____

CONFIRMATION OF SOIL CONDITIONS PRIOR TO TREATMENT:

Confirmation by field test: _____ Yes _____ No

APPENDIX 4

Sprayer Calibration Test Form

REGIONAL DISTRICT OF NORTH OKANAGAN



SPRAYER CALIBRATION TEST

PESTICIDE: _____

UNIT TYPE: _____ SPRAYER MAKE OR NUMBER: _____

NAME: _____ APPLICATOR: _____

DATE: _____ TEST: _____

1. DETERMINE SPRAY VOLUME TO A TEST AREA:

(A) Test strip area: (_____ m long) x (_____ m wide) = _____ sq. m

(B) Equipment specifications (where applicable):

- Transmission gear: _____
- Engine RPM: _____
- Speedometer setting: _____ Km/hr.

(C) Spray Tank Pressure: _____ Kpa or _____ Psi

(D) Volume of water used in test: _____ Litres

(E) Calculate spray volume per unit area:

- Spray Volume (L/Ha) = $\frac{\text{“water used in test” (D) x 10.000 m/ha}}{\text{area of test strip in sq. meters (A)}}$
- Spray Volume (L/Ha) = _____ (Litres / Ha)

(F) Calculate # of Ha one full sprayer tank will cover:

- # of Ha = $\frac{\text{Sprayer Tank Volume (\# of Litres)}}{\text{Spray Volume (E) (L/Ha)}}$

(G) Amount of Product to Add to tank:

- Product Amount = # of hectares one full tank will cover (F)X application rate.

*NB: Determine that the water volume is between _____
and _____ (Litres / Ha)

The spray solution is to be mixed at _____ % or _____ ml/15 litre backpack.

*Multiply the water used in the mix by _____ % to determine the amount of product to add to the tank.

APPENDIX 5

Site and Invasive Plant Inventory Record

APPENDIX 6

Invasive Plant Chemical & Mechanical Treatment Record

APPENDIX 7

Pesticide Use Record Form

APPENDIX 8

Chemical or Mechanical Monitoring Record

APPENDIX 9

Biological Control Agent Dispersal Record

APPENDIX 10

Biological Control Agent Release and Monitoring Record