



# OKANAGAN REGION INVASIVE PLANT STRATEGY 2005

MINISTRY OF ENVIRONMENT  
ENVIRONMENTAL STEWARDSHIP DIVISION



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## **EXECUTIVE SUMMARY**

The Ministry of Environment (MOE), Environmental Stewardship Division (ESD) is mandated to conserve biological diversity by reducing invasive plant populations to protect native plant communities and habitats.

Invasive plants are typically introduced to British Columbia (BC) by humans from foreign countries or to ecosystems outside of their natural distributions. These introduced invasive plants lack natural predators and pathogens that would otherwise keep their populations in check. A common characteristic of all invasive plants is their aggressive, competitive behaviour. Once established, invasive plants have a tremendous capacity to invade adjacent, undisturbed natural plant communities, displace wildlife and disrupt natural ecosystem functions.

The purpose of the Okanagan Region Invasive Plant Strategy is to address invasive plant management issues within Okanagan Region Provincial Parks, Protected Areas, Ecological Reserves and Conservation Lands (Nature Trust of BC Lease-Back Lands and Wildlife Management Areas) in a proactive manner. Strategic Goals selected to guide the Invasive Plant Program include:

- Partnerships and Coordination;
- Education and Public Awareness;
- Research;
- Prevention;
- Early Detection;
- Rapid Response; and
- Integrated Management.

Priority invasive plant management areas identified using The Decision Tool to Prioritize Invasive Plant Program Projects. This decision tool assessed specific criteria<sup>1</sup> and assigned points, based on selected values, to each area. Based on the total number of points awarded, the area was defined as a Priority 1 (101-155 points), a Priority 2 (51-100 points) or a Priority 3 (0-50 points).

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<sup>1</sup> Priority invasive plant species (present or threatening), conservation values, risk to ecological resources, ability to leverage funds, risk of lost opportunity, existing investment, adjacency issues and wildfire impacts.

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## **1.0 MISSION STATEMENT**

Our mission is to maintain and restore the natural diversity of provincial ecosystems and fish and wildlife species and their habitat; and to provide park, fish and wildlife recreation services and opportunities to British Columbians and visitors.

## **2.0 INVASIVE PLANT PROGRAM BACKGROUND**

ESD, Okanagan Region manages 330,791 hectares of Provincial Parks, Protected Areas, Ecological Reserves and Conservation Lands<sup>2</sup>. Diverse ecosystems thrive within these areas and include sensitive grasslands, fertile riparian areas, fragile alpine meadows and productive forests. These ecosystems, which provide critical habitat for many of BC's rare and endangered species, are being threatened by invasive plants at an alarming rate.

Invasive plants are typically introduced to BC by humans from foreign countries or to ecosystems outside of their natural distributions. These introduced invasive plants lack natural predators and pathogens that would otherwise keep their populations in check.

A common characteristic of all invasive plants is their aggressive, competitive behaviour. Once established, invasive plants have a tremendous capacity to invade adjacent, undisturbed natural plant communities, displace wildlife and disrupt natural ecosystem functions. Currently, thousands of hectares of BC's land base have been infested by invasive plants. As land managers, ESD is responsible for maintaining biodiversity and healthy ecosystems for our natural flora and fauna; therefore, an effective, collaborative approach to invasive plant management is required.

In 2002, the Okanagan Region developed **Pest Management Plan (PMP) 671-0003-2002/2007** (Appendix 1). This PMP was approved May 31, 2002 by the Environmental Protection Division under the *Pesticide Control Act*. Since 2002, all invasive plant program operations have been implemented in accordance to this PMP, associated Approval Letter (Appendix 1) and Amendments (Appendix 1).

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<sup>2</sup> Conservation Lands include Nature Trust of BC Lease-Back Lands and Wildlife Management Areas.

PMP 671-0003-2002/2007 contains sections including:

- Scope of The Problem<sup>3</sup> (Section 3.0);
- Weed Identification and Prioritization<sup>4</sup> (Section 4.0);
- Weed Control History<sup>5</sup> (Section 5.0);
- Integrated Pest Management Program (Section 6.0);
- Consultation and Coordination With Other Agencies (Section 7.0);
- Environmental Protection and Conservation (Section 8.0);
- Herbicide Application Operational Practices (Section 9.0); and
- Implementing the Weed Management Plan (Section 10.0).

Prior to 2002, the Region operated under a Weed Management Plan which was developed in 2000. This plan was utilized by the former Okanagan District and was referenced in the development of the current PMP.

ESD operational staff (Appendix 11) involved with Early Detection and Rapid Response includes Area Supervisors and Park Rangers. ESD planning and coordination staff (Appendix 11) involved with all aspects of the Invasive Plant Program includes the Ecosystem Biologist and the Invasive Plant Program Technician (IPPT). The ESD Fish and Wildlife Science Allocation team also assists in invasive plant infestation identification and reporting.

Over the years, the Okanagan Region has implemented invasive plant management operations in coordination with the South Okanagan-Similkameen Invasive Plant Society (SOSIPS)<sup>6</sup>, the Boundary Weed Committee, the North Okanagan Weed Committee and the Nature Trust of BC as well as local volunteer groups (e.g. Friends of Kal Lake, Ecological Reserve Wardens, etc.). In 2004, the Okanagan Region participated in media events which brought public awareness to the threat of invasive plant encroachment within the wildfire affected areas of Okanagan Mountain Provincial Park, Myra-Bellevue Provincial Park, Vaseux Protected Area and Vaseux Provincial Park.

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<sup>3</sup> Identifies relevant legislation, authorities, policies and guidelines as well as other processes and higher level plans

<sup>4</sup> This Section is being adapted to reflect changes since 2002

<sup>5</sup> Prior to 2002

<sup>6</sup> Prior to the fall of 2004, SOSIPS was known as the South Okanagan-Similkameen Weed Committee

### **3.0 INVASIVE PLANT PROGRAM STRATEGIC GOALS**

#### ***Goal 1: Partnerships and Coordination***

Objective 1: Coordinate invasive plant management efforts throughout the 2003 wildfire impacted areas which include Okanagan Mountain Fire (Okanagan Mountain Park, Myra-Bellevue Park), Vaseux Fire (Vaseux Park and Protected Area) and Anarchist Fire (Anarchist Protected Area) as well as other identified priority areas.

**Action:** ESD staff will continue to play a lead role in SOSIPS meetings and coordinate inventory and treatment (chemical, mechanical and biological) efforts for identified priority sites and priority invasive plants.

Objective 2: Develop consistent communications and working relationships with local weed committees and adjacent land managers.

**Action:** ESD staff will contact local weed committee chairs and adjacent land managers to coordinate invasive plant management efforts and identify priority invasive plant species.

Objective 3: Develop partnerships with educational institutes (e.g. UBC, OUC, TRU) to facilitate research initiatives.

**Action:** Contact educational institutes and collaborate with graduate student programs.

#### ***Goal 2: Education and Public Awareness***

Objective 1: Provide invasive plant training to Park Facility Operators (PFOs), BC Parks Rangers and other appropriate ESD staff.

**Action:** Develop a training program template which consists of a Power Point presentation, handouts and field day.

**Action:** Ensure that BC Parks Rangers, Area Supervisors and PFOs are trained in the identification, inventory, management (control) and monitoring of invasive plants within their operational areas.<sup>7</sup>

Objective 2: Facilitate and organize a volunteer program to assist ESD staff with operational invasive plant control, inventories, prevention, seed collection and native plant propagation.

**Action:** Identify ESD staff who will be involved with the volunteer program.

**Action:** Design a volunteer outreach strategy and implement.

**Action:** Organize invasive plant identification, inventory, management (control) and monitoring training for volunteers.

**Action:** Develop a reporting schedule for volunteers to submit invasive plant inventory and management data to ESD staff.

**Action:** Organize native seed collection and propagation training for volunteers.

**Action:** Organize field days for restoration projects involving planting of seedlings, which have been propagated by volunteers, to prevent the establishment of invasive plants on newly/historically disturbed sites.

**Action:** Designate an “Appreciation Day” for all volunteers at the end of the field season (October).

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<sup>7</sup> PFOs will be informed of any invasive plant control operations within their area so that the sites are not disturbed. This is vital with regards to biological control release sites and chemical treatments.

### **Goal 3: Research<sup>8</sup>**

Objective 1: Understand the direct and indirect impacts of selected invasive plants on critical habitats and species at risk (SAR) within priority conservation areas (e.g. White Lake Grasslands Protected Area).

**Action:** ESD, in coordination with adjacent land owners and other relevant agencies, will identify knowledge gaps and select the appropriate methodologies to conduct research projects.

Objective 2: Monitor and study invasive plant response to wildfire. Methodologies used for these projects will serve as templates for future research and monitoring projects within wildfire/prescribed burn areas throughout the Okanagan Region.

**Action:** Establish photo monitoring plots and vegetation transects within the wildfire affected areas (Okanagan Mountain Park, Vaseux Park and Protected Area and Anarchist Protected Area). Current procedures are provided in Appendix 9.

Objective 3: Monitor and study invasive plant response to selected control treatments (biological, chemical and mechanical). Success or failure of selected treatments will assist in more effective integrated invasive plant management strategies.

**Action:** Establish photo monitoring plots and vegetation transects to study and monitor invasive plant response to selected control treatments (biological, chemical and mechanical).

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<sup>8</sup> Research objectives will be updated to reflect additional knowledge gaps.



## **Goal 4: Prevention**

**Objective 1:** Prevent new invasive plant species from infesting lands managed by ESD through awareness and communications.

**Action:** Liaise with adjacent land managers (Ministry of Forests, the Nature Trust of BC, CWS, etc), SOSIPS and local weed committees to determine potential threats of encroachment from non-Ministry managed lands.

**Action:** Liaise with other provincial, federal and international organizations, governments and agencies (e.g. Cross Borders Project) to determine potential threats of encroachment from outside of the Region.

**Objective 2:** Prevent/reduce the introduction and spread of invasive plants, which may occur through operational and/or recreational activities, throughout ESD managed lands.

**Action:** Use alternatives to straw bales, which may contain invasive plant parts and seeds, for erosion control and wildlife feed.

**Action:** Thoroughly clean machinery and equipment when moving from site to site.

**Action:** Encourage guide outfitters and recreation guides to use pellets for horse feed.

**Action:** Use non-persistent/non-invasive reclamation seed mixes for erosion control, disturbance mitigation and site restoration.

**Action:** Ensure PFOs maintain “invasive plant free” buffers along vector corridors and comply with pad maintenance requirements.

**Action:** Monitor range use, in cooperation with the Ministry of Forests, to ensure that appropriate grazing regimes are practiced within Protected Areas; therefore, reducing the treat of invasive plant establishment.

**Action:** Encourage and monitor appropriate trail use within Provincial Parks and Protected Areas including horse-back riding, mountain biking and hiking.

### **Goal 5: *Early Detection***

Objective 1: Identify, record and report newly discovered infestations of priority invasive plant species particularly within priority management areas.

**Action:** Conduct a gap analysis to determine information/inventory gaps within priority areas.

**Action:** Through adjacent land manager communications, determine the risk of priority species encroachment, which do not currently infest ESD managed lands, from adjacent areas and inventory/monitor for those species.<sup>9</sup>

**Action:** Monitor vectors (trails, group sites, access roads, parking areas, toilet facilities, high use areas, etc) for new invasive plant species before they spread to adjacent undisturbed areas.

**Action:** Update existing inventories regularly to monitor changes in species composition, distribution and density.

**Action:** ESD staff will stay “up-to-date” with regards to new invasive plants of concern.

**Action:** Report any infestations of concern, within or outside of ESD managed lands, to the IPPT or the SOSIPS Coordinator.

### **Goal 6: *Rapid Response***

Objective 1: Upon early detection of identified species, implement control treatments (chemical or mechanical) immediately or as soon as possible in compliance with PMP 671-0003-2002/2007. The initial objective is to eradicate any new infestations of priority species prior to their establishment. The secondary objective, if eradication is not feasible, is to contain the infestation from spreading.

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<sup>9</sup> Annual monitoring is required to ensure that priority species infesting adjacent lands do not establish on ESD managed lands.

**Action:** ESD staff will monitor all reports of invasive plants species and act accordingly.

### **Goal 7: *Integrated Management***

Objective 1: Manage invasive plant infestations in an integrated manner so that all available control options (biological, mechanical, chemical) are explored and the most effective control option(s) are selected.

**Action:** Inventory invasive plant infestations and record the species composition, distribution and density to assist in control method selection. Chemical and mechanical control are best suited for smaller infestations or as a containment tool while biological control (pending availability) is best suited for larger, dense infestations.

**Action:** Be aware of the biology of all invasive plants to be treated to ensure that the most effective control option is selected at the most susceptible stage of growth and prior to seed set.

**Action:** Observe and record all site characteristics such as presence of surface/subsurface water, wells, water intakes and sensitive habitats as well as soil composition to ensure that the appropriate control method is implemented.

**Action:** Implement all control options in compliance with PMP 671-0003-2002/2007.

#### **4.0 PRIORITY INVASIVE PLANT SPECIES**

Priority invasive plant species are a combination of Provincial and Regional Noxious Weeds (Appendix 2) identified in the Ministry of Agriculture, Food and Fisheries “Guide to Noxious and Other Selected Weeds of British Columbia” as well as species of specific concern to the Okanagan Region.

Priority invasive plant species and associated management strategies will vary depending on current distributions and densities within priority management areas. For example, the management strategy for sulphur cinquefoil within Fintry Provincial Park is containment due to its extensive distribution and density throughout high-use areas of the park (group site, fields, etc). By containing the current infestations it will reduce the risk of spread beyond its current boundaries into adjacent areas of the park as well as Fintry Protected Area. However, the management strategy for sulphur cinquefoil

within Trout Creek ER is eradication due to the minimal distribution and density throughout the Ecological Reserve; therefore, there is a higher chance of eradication success.

## **5.0 PRIORITY PP, PA, ER AND CONSERVATION LANDS**

### ***5.1 Determining Priority Areas: Step 1***

Conservation Risk Assessments for BC Parks Okanagan Region were reviewed to determine conservation values for all parks, protected areas and ecological reserves within the Okanagan Region. <sup>10</sup> Conservation values were determined by assessing ecological values within each area:

- Ecosystem Representation – rarity and diversity of terrestrial and marine ecosystems.
- Species/Habitats at risk – rare species/habitats, diversity of rare species/habitats.
- Special Features – rarity and diversity of special landforms/features, rarity and diversity of cultural features.

The highest score possible is 44 and the lowest score possible is zero; therefore, the higher the score, the higher the conservation values.

### ***5.2 Determining Priority Areas: Step 2***

The Decision Tool to Prioritize Invasive Plant Program Projects (Appendix 3) was used for selected Provincial Parks, Protected Areas, Ecological Reserves and Conservation Lands. These areas were initially selected based on existing conservation values, risk or threat of invasive plant establishment, priority invasive plant species and/or wildfire disturbance. For each selected area, points were awarded for each of the following criteria:

1. Priority Invasive Plant Species;
2. Conservation Values (including Species at Risk);
3. Risk to Ecological Resources;
4. Able to Leverage Funds;
5. Risk of Lost Opportunity;
6. Existing Investment;

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<sup>10</sup> Conservation lands were not included and there are some parks, protected areas and ecological reserves that were not assessed.

7. Adjacency Issues; and
8. Wildfire/Disturbance.

Each criterion's highest point is five; therefore, the highest total an area can receive is 155:

- Priority 1: 101-155 (Appendix 4)
- Priority 2: 51-100 (Appendix 5)
- Priority 3: 0-50 (Appendix 6)

Inventory, treatment (biological, mechanical and chemical) and monitoring projects will be implemented in coordination with Okanagan Region priority areas; therefore, projects will be initiated on Priority 1 areas first, Priority 2 areas second and Priority 3 areas last. This assists in allocating Invasive Plant Program funds and ESD staff time.

### **5.3 Priority Areas**

Conservation values, area comments and ESD staff involvement are detailed for priority areas within Appendix 7. In addition, Decision Tool for Prioritizing Invasive Plant Program Project Ranks, Conservation Value Scores, Priority Ranks and Recommended Treatment/Inventory Months are provided in Appendix 8.

Leafy spurge



Orange hawkweed



Spotted knapweed



### 5.3.1 Priority 1 and 2 Areas

Area	PP/PA/ER	Priority	Priority Invasive Plant Species & Management Strategy (if known)
South	Anarchist PA	1	hound's tongue, Canada thistle, bull thistle - contain St.John's-wort - eradicate (currently outside PA) Dalmatian toadflax - eradicate (one patch) Diffuse knapweed - biological control
	Hayne's Lease ER		puncturevine - control/contain Dalmatian toadflax, Canada thistle, diffuse knapweed, bull thistle, Russian thistle, Russian knapweed - control
	Mahoney Lake ER		hound's tongue, sulphur cinquefoil, blueweed, Dalmatian toadflax, Canada thistle, Russian knapweed - control (mechanical)
	South Okanagan Grasslands PA		sulphur cinquefoil, hound's tongue, Canada thistle, Dalmatian toadflax, diffuse knapweed, spotted knapweed <i>*management strategy to be determined</i>
	Vaseux PP and PA		puncturevine (one patch in PP) - eradicate purple loosestrife - biological control diffuse knapweed, Dalmatian toadflax, bull thistle, Canada thistle, hound's tongue, St.John's-wort - control
	White Lake Grasslands PA		blueweed, puncturevine (to be confirmed) - eradicate/contain sulphur cinquefoil, hound's tongue, burdock, Canada thistle, Dalmatian toadflax, Russian knapweed, spotted knapweed, diffuse knapweed - control
	Nature Trust of BC Lease-Backs	sulphur cinquefoil, diffuse knapweed, Dalmatian toadflax, Russian knapweed, burdock - control	
	Field's Lease ER	2	Canada thistle, hound's tongue, Dalmatian toadflax, diffuse knapweed - control
	Inkaneep PP		hound's tongue, Canada thistle, diffuse knapweed, Dalmatian toadflax, burdock - control
South Okanagan Wildlife Management Area (SOWMA)	Unknown - inventory required		
East	Myra-Bellevue PP	1	tansy ragwort (currently outside PP) - eradicate sulphur cinquefoil, Canada thistle, spotted knapweed, diffuse knapweed, bull thistle, St.John's-wort, oxeye daisy, Dalmatian toadflax - control
	Okanagan Mountain PP		tansy ragwort - eradicate/contain leafy spurge (to be confirmed) - eradicate purple loosestrife (to be confirmed) - eradicate rush skeletonweed (to be confirmed) - eradicate Canada thistle, St.John's-wort, sulphur cinquefoil, oxeye daisy, hound's tongue, Russian knapweed, diffuse knapweed, bull thistle, Dalmatian toadflax, common tansy - control
	Conkle Lake PP		Unknown - inventory required
	Gladstone PP	2	Texas Creek: spotted knapweed, Dalmatian toadflax, hoary alyssum, blueweed - control/contain
	Granby PP		Unknown - inventory required
	Hayne's Point PP		Dalmatian toadflax, elm, Russian olive, Russian knapweed, diffuse knapweed, Canada thistle, baby's breath - control purple loosestrife - biological control
	Johnstone Creek PP		hound's tongue, diffuse knapweed, common tansy, Russian knapweed, Canada thistle, bull thistle, St.John's-wort, sulphur cinquefoil, oxeye daisy - control
	Kettle River PP		sulphur cinquefoil, leafy spurge, common anchusa, hoary alyssum - eradicate Dalmatian toadflax - biological control hound's tongue, bull thistle, diffuse knapweed, St.John's-wort, Russian knapweed, burdock - control

Area	PP/PA/ER	Priority	Priority Invasive Plant Species & Management Strategy (if known)
North	Kalamalka Lake PP	1	scotch thistle, rush skeletonweed (currently outside park) - eradicate sulphur cinquefoil, St.John's-wort, Dalmatian toadflax, spotted knapweed, diffuse knapweed, Canada thistle, bull thistle, burdock - control
	Campbell-Brown ER	2	sulphur cinquefoil, Dalmatian toadflax - inventory and control
	Ellison PP		sulphur cinquefoil, hound's tongue, knapweed, Canada thistle, burdock - control
	Enderby Cliffs PA		sulphur cinquefoil - inventory and control/contain
	Greenbush Lake PA		Unknown - inventory required
	Kalamalka Lake PA		Unknown - inventory required
	Kekuli PP		rush skeletonweed (currently outside park) - eradicate Dalmatian toadflax, sulphur cinquefoil, Canada thistle, knapweed - control
	Kingfisher Creek PP and ER		Unknown - inventory required
	Mara Meadows ER		Unknown - inventory required
Monashee PP	Unknown - inventory required		
Central	Trout Creek ER	1	sulphur cinquefoil - eradicate/contain Dalmatian toadflax, diffuse knapweed, Canada thistle - control
	Fintry PP and PA	2	sulphur cinquefoil, spotted knapweed, diffuse knapweed, Canada thistle, bull thistle, Dalmatian toadflax - control/contain
	Bear Creek PP		scotch thistle (to be confirmed) - eradicate sulphur cinquefoil, spotted knapweed, diffuse knapweed, Canada thistle - control
	Greystokes PP		Unknown - inventory required
	Sun-Oka PP		baby's breath, Dalmatian toadflax, spotted knapweed, diffuse knapweed - control
West	Cathedral PP and PA	1	Dalmatian toadflax (1 plant found on Ashnola Rd outside park) - eradicate burdock, diffuse knapweed, hound's tongue, bull thistle - control/contain
	Snowy PA		Unknown - inventory required
	EC Manning PP		St.John's-wort, yellow toadflax, oxeye daisy, hound's tongue, Canada thistle, bull thistle, common tansy, spotted knapweed, Dalmatian toadflax - control/contain/eradicate outside main infestations
	Cascade Recreation Area	2	Unknown - inventory required

### 5.3.2 Priority 3 Areas

Priority 3 areas are all other Provincial Parks, Protected Areas, Ecological Reserves and Conservation Lands within the Okanagan Region (Appendix 7 and Appendix 8).

## 6.0 REFERENCES

- Millar, J. 2004. Invasive Plant Webpage. Ministry of Environment. Environmental Stewardship Division. Okanagan Region.
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- The Ministry of Agriculture Food and Fisheries and the Open Learning Agency. 2002. A Guide to Weeds in BC and Seven Steps to Managing Your Weeds.
- Government of Canada. 2004. An Invasive Alien Species Strategy for Canada & the Action Plan for Invasive Alien Terrestrial Plants and Plant Pests.

## 7.0 CONTACT LIST – 2005

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	Lisa Scott	Chair	South Okanagan-Similkameen Invasive Plant Society	lscott@vip.net (250) 404-0115



## 8.0 GLOSSARY

**Biological Control** is a method of managing specific invasive plants using biological agents (typically the invasive plant's natural predators) to weaken, not eradicate, the target invasive plant infestation by decreasing seed dispersal as well as reducing density and distribution. This method of control is best suited to large, dense infestations where other methods of control are not cost effective or environmentally sound.

**Chemical Control** uses herbicides to either injure or kill invasive plants. This method of control is best suited to small, isolated infestations.

**Containment** is a management strategy that uses either mechanical or chemical control to contain an invasive plant infestation within a certain geographic area.

**Eradication** is a management strategy that typically uses chemical control (mechanical control within Pesticide Free Zones) to completely get rid of an invasive plant infestation within a geographic area. This strategy is implemented on small, isolated infestations of priority invasive plant species.

**Invasive Plants** are typically introduced to BC by humans from foreign countries or to ecosystems outside of their natural distributions. These introduced invasive plants lack natural predators and pathogens that would otherwise keep their populations in check.

**Mechanical Control** uses physical methods (hand pulling, hand digging, cutting...) to manage invasive plants.

**Vectors** are routes of spread for invasive plants and are typically frequented by humans and/or wildlife. Invasive plant seeds and parts are relocated from infested area to "pristine" areas thus allowing for new infestations to establish. Examples of vectors include trails, group sites, access roads, parking areas, toilet facilities and high use areas.

## 9.0 APPENDICES

**Appendix 1:** Pest Management Plan 671-0003-2002/2007, Approval Letter and Amendments (3)

**Appendix 2:** Invasive Plant Lists (Provincial Noxious, Regional Noxious and other species of concern)

**Appendix 3:** Decision Tool for Prioritizing Invasive Plant Program Projects

**Appendix 4:** Priority 1 Management Areas

**Appendix 5:** Priority 2 Management Areas

**Appendix 6:** Priority 3 Management Areas

**Appendix 7:** Conservation Values for Okanagan Region Parks, Protected Areas, Ecological Reserves and Conservation Lands

**Appendix 8:** Invasive Plant Program Priority Areas

**Appendix 9:** Monitoring Procedures: Wildfire Affected Parks and Protected Areas

**Appendix 10:** Field Data Capture Criteria 2005

**Appendix 11:** Invasive Plant Program Roles and Responsibilities

