

Summary Report on Invasive Plant Management in British Columbia

2004/05 and 2005/06



**Prepared for the Minister of Agriculture and Lands
November 2005**

Accomplishments from the coordinated effort of:

**Ministry of Agriculture
and Lands
Ministry of Environment**

**Ministry of Forests
and Range
Ministry of Transportation**

Executive Summary

Invasive plants have highly adaptive, aggressive mechanisms of establishment and growth, and cause serious economic and environmental impacts to forestry, agriculture, tourism/recreation, industries and First Nations. Also affected are public health, biodiversity, land values, livestock/wildlife and markets/trade.

The matter of invasive plants has enormous scope and complexity. There is no silver bullet to address this concern. The following key elements must all be present with adequate strength to constitute a successful program:

1. Provincial network of committed stakeholders
2. Strategic prevention, education and awareness programs
3. Provincial inventory of invasive plant sites and adequate surveillance
4. Government policy and funding support
5. Adequate research capacity and technical expertise

The most important element is the provincial network of dedicated stakeholders willing to work together to address invasive plants. This network is the critical underpinnings for future efforts, and started from the early work and foresight of the provincial government realizing that the matter of invasive plants could not be managed by government alone. Emergence of the Invasive Plant Council of British Columbia (IPC) in 2005 complements the significant legislative and operational mandates of the Provincial Government, and reduces the government burden for education, awareness and coordination of non-government groups. The IPC, a society with extensive representation from all perspectives with a vested interest in invasive plants, is the key synergist to develop the capacity of local weed committees beyond their roles today.

The recent funding uplifts in 2004/05 and 2005/06 for invasive plants have led to some remarkable progress. Major accomplishments include:

1. Provincial network and infrastructure of committed stakeholders

British Columbia (BC) has achieved a level of coordination for invasive plant activity that is unprecedented in BC's history. A substantial strengthening of partnerships and linkages amongst the various stakeholders - the public, resource industries, utility companies, First Nations, environmental groups, and governments - has occurred, as a result of the IPC, contributing to more effective and efficient management of invasive plants in BC.

Key partnerships include the IPC and the Inter-Ministry Invasive Plant Committee (IMIPC) which includes representatives from the Ministries of Agriculture and Lands; Environment; Forests and Range; and Transportation, as well as the IPC.

- Increased provincial funds have enabled private sector and local government spending to be leveraged through local weed committees, and increased the investment in invasive plant management by volunteers.
 - In 2005, the East Kootenay Pilot Project engaged over 550 volunteer participants accumulating over 2300 volunteer hours to achieve on-the-ground control of weed sites in sensitive areas and riparian sites - while increasing public awareness. Over 16 businesses participated as sponsors for local events.
- Supported the Gitksan Nations 'Weeding Out the Invaders' program. Accomplishments included 72 inventories, a community newsletter, and distribution of information packages to surrounding reserves to assist in the establishment of invasive plant projects in other First Nations communities. Future plans, pending funding, include training of 20 summer students from the 14 House Groups in the Mid Skeena Watershed, in inventory work, control and education/awareness.
- Initiated strategic Cross Border partnerships with neighboring Canadian provinces and US states that will limit movement of invasive and noxious weed seed sources between Canada and the US through traveled waterways, railways and highways.
- Led to coverage of almost all areas of the province by 2006 with 26 local weed committees. These committees coordinate in the development and implementation of regional and site-specific invasive plant control strategies on Crown and private lands. Refer to Figure 1.

2. Strategic prevention, education and awareness programs

The IPC has facilitated networking between all levels of individuals and agencies impacted by invasive plants, established communication tools including a website and newsletters, presented awareness information at First Nations conferences, and developed a collaborative and guiding role for the National Forest Strategy and National Terrestrial Plants and Plant Pest Working Group. Provincial funding has been leveraged by funds from the Fraser Basin Council, local governments and private individuals.

3. Provincial inventory of invasive plant sites and adequate surveillance

- Implementation of and access to the provincial invasive plant database strengthens cooperation and coordination and further increases awareness. This is the most comprehensive invasive plant data base in Canada, and clearly demonstrates BC's leadership role.

- Improved inventories and awareness led to the detection of new outbreaks of serious species, such as a tansy ragwort site in the Queen Charlotte Islands, and velvetleaf in Oliver. These incursions were promptly eradicated.
- Increased BC surveillance and cross borders partnerships successfully defended BC from the penetration and establishment of jointed goatgrass, yellow starthistle, and crupina (all provincially listed noxious weeds).
- The first invasive plant inventory of provincial parks and protected areas occurred in 2005, and has led to the development of a strategic management plan to address invasive plant issues in parks and protected areas throughout the province. Targeted planning will lead to increased protection of these areas in our super-natural province.

4. Government policy and funding support

More weed control treatments took place which resulted in all known small infestations of highly invasive species being managed. This was not possible before the uplifts were available. (Note: this approach has not reduced other existing infestations of invasive plants, and without additional funding, they will continue to expand by 14% annually.)

Key achievements in 2004/05 and 2005/06 include:

- Post-fire invasive plant management (inventories, invasive plant treatment, awareness and publicity) to assist in the recovery of ecologically sensitive areas on Crown land, including provincial parks and protected areas, devastated by the 2003 Okanagan area wildfires
- Controlling Scotch broom, Japanese knotweed, giant hogweed, carpet burweed, sulphur cinquefoil, Himalayan blackberry, dalmatian toadflax, tansy ragwort and other noxious weeds in 16 provincial parks, 7 protected areas, 4 ecological reserves and numerous wildlife management areas throughout BC
- Expansion of invasive plant control on critical highway right-of-way sites throughout the province with increased chemical control in the southern interior and northern regions, increased manual control and mowing in the northwest, wild chervil control in the Fraser Valley and a massive cutting and removal program for Scotch broom, gorse, tansy ragwort, giant hogweed and Canada thistle on Vancouver Island
- Evidence of greater participation by government has increased the willingness and interest of private stakeholders, e.g. utility companies, to participate and take responsibility within their jurisdictions/areas

5. Adequate research capacity and technical expertise

- Increased provincial, federal and international research efforts are identifying effective treatment methods using biocontrol and other environmentally sustainable practices to address key priorities.
- Increased awareness of the impacts associated with highway dredging and importation of contaminated soils and gravel by Highway's Maintenance Contractors will lead to reduced weed seed spread.

It is very evident from the many accomplishments and activities outlined in this report, that increased provincial funding is having impacts in the province. There is an increased awareness of the problems that we face from invasive plants as well as significant advances in management. With the improved inventories developed in the past two years, BC is in the best position ever to strategically move forward.

The tremendous improvements in programs, coordination, cooperation and shared funding presently under way has created a strong optimism that the 'war against weeds' can be won. Over the last three years there have been exceptional efforts by governments, agencies, and private individuals to get a cooperative, coordinated invasive plant program under way in the province. The organizations are in place and they are working together in a unified way. The IPC has the capacity and networks to develop and strengthen partnerships, support local weed committees, focus on education and awareness, and facilitate research and surveillance priorities.

BC is the leader in invasive plant management in Canada. Federal agencies and other provinces (Manitoba and Nova Scotia) are looking to BC to find solutions for their invasive plant issues. British Columbia has:

- the only Invasive Plant Council in Canada
- the most comprehensive partnerships and linkages amongst the various stakeholders
- the most comprehensive invasive plant data base in Canada
- leading-edge research efforts using biological control and other environmentally sustainable practices to address key priorities.

With the overall increased awareness of invasive species and recent federal involvement through the National Invasive Alien Species Strategy, the eyes of the nation will be on BC for our leadership in invasive plant management.

Appropriate provincial funding for operational control and to support the Invasive Plant Council is essential to continue the exceptional progress that has been made, and to turn back the impending invasive plant threats. Participation by the Provincial Government as a significant player is instrumental to encourage other stakeholders to continue their efforts.

We do not want to emulate the situation in California, which is now so overrun with invasive plants, that 8 million ha are moderately to heavily infested with yellow starthistle. A spiny, very competitive plant that reduces the diversity of native plant communities, yellow starthistle is a prime example of how one species can cause many impacts. Toxic to horses, it reduces forage production for livestock and wildlife, cause roadside weed problems, reduces the quality and yield of crops, and prevents recreational access to infested sites. It is only 30 km from our border with Washington State.

We are truly at a crossroad. Adequate funding is the last cornerstone required. Decisions made today will be compounded in the positive, through the synergy and leveraging of committed individuals throughout the province.

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Introduction

Invasive plants destroy British Columbia's irreplaceable resources. These introduced, non-native species threaten our agricultural base, grasslands, waterways, tidelands, parks and protected areas, wildlife, property and recreational values, public health and safety, and the ecological health and diversity of the province's native environment. The ability to protect the diversity and aesthetics of the province's natural environment and its capability to generate economic activity requires a coordinated effort between the public and the Crown.

Invasive species are the second largest threat to our biodiversity, after direct loss of habitat.

Roughly 94% of the province's land-base is Crown land, and includes forests, grasslands and transportation corridors - all susceptible to invasive plant invasion. A number of ministries have legal obligations and mandated responsibilities for resource management and stewardship of these lands.

In 2004, the provincial Cabinet approved a two-year uplift in funding following extensive efforts by both public and private organizations to raise the profile of invasive plants. This uplift of \$3.3 million (\$1.65 million for each of fiscal 2004/05 and 2005/06) increased provincial government spending for program staff and direct on-the-ground treatment of invasive plants on Crown land to a total of \$3.969 million.

**Table 1: Provincial Government Funding 2004/05 and 2005/06
(Ministry Estimates)**

Ministry *	FTE ** Cost (est.)	Base Funds (\$) Including salaries 04/05	Base Funds (\$) Including salaries 05/06	Additional (\$) 04/05 per CCED request	Additional (\$) 05/06	Total Annual Funds	Total Funds 04/05 and 05/06
MoF	6.6 \$426K	902,000	902,000	750,000	750,000	1,652,000	3,304,000
MWLAP	0.4 \$31K	81,000	81,000	19,000	19,000	100,000	200,000
MoT	1.0 \$82K	728,000	728,000	646,000	646,000	1,374,000	2,748,000
MAFF	3.0 \$246K	624,000	624,000	50,000	50,000	674,000	1,348,000
MSRM	-	0	0	150,000	150,000	150,000	300,000
LWBC	-	0	0	50,000	50,000	50,000	100,000
Total	11.0 \$785K	2,335,000	2,335,000	1,665,000	1,665,000	4,000,000	8,000,000

* MoF = Ministry of Forests; MWLAP = Ministry of Water, Land & Air Protection; MoT = Ministry of Transportation;
MAFF = Ministry of Agriculture, Food & Fisheries; MSRM = Ministry of Sustainable Resource Management; LWBC = Land & Water BC
** FTE estimates and costs are approximate. Base operational funding was approximately \$1,550,000.

Table 2: Historical Operational funding levels for invasive plant control in British Columbia

Ministry	1993/1994	1998/1999	2003/2004
MAFF	\$411,000	\$260,000	\$378,000
MOF	\$1,000,000	\$880,000	\$664,000
MOT	\$250,000 (1995/96)	\$687,000 (2000/2001)	\$646,000
MWLAP	-	\$66,500	\$20,000
MSRM/LWBC	-	-	\$0
TOTAL	\$1,661,000	\$1,893,500	\$1,708,000

An additional \$2.35 million in February 2005, through the Rural Enhancement Initiative, provided funding for two, three-year pilot projects (\$1,950,000) to evaluate the effectiveness of local third-party delivery models - see APPENDIX A for information on the Regional District of East Kootenay and Northwest Invasive Plant Council Pilot Projects. Also included was biological control research (\$100,000), and support for the newly developed Invasive Plant Council (\$300,000). The Invasive Plant Council is a newly registered society with extensive representation from all sectors that have a vested interest in invasive plant management.

An Inter-Ministry Invasive Plant Committee (IMIPC) was established in 2004 to develop and implement an effective, coordinated plan for invasive plant management on Crown lands. This Committee is comprised of representatives from the Ministries of Agriculture and Lands; Environment; Forests and Range; and Transportation, and the Invasive Plant Council of BC (IPC).

In 2004/05, the IMIPC directed \$443,000 from Ministry funding uplifts to a common pool to support 25 high priority cooperative projects aimed at inventory, control and key awareness issues. For 2005/06, there was \$192,007 of the uplifts directed to 12 of these projects. The IMIPC uses a science-based approach, combining known plant invasive capabilities and site susceptibility, to determine management priorities and allocate funding.

Pillars for Invasive Plant Management - Progress Report

Effective invasive plant management requires the following the following key pillars:

1. Provincial network of committed stakeholders
2. Strategic prevention, education and awareness programs
3. Provincial inventory of invasive plant sites and adequate surveillance
4. Government policy and funding support
5. Adequate research capacity and technical expertise

Each pillar is necessary to successfully manage the impacts of invasive plants. Surveillance without adequate on-the-ground control, or co-ordination without effective delivery prevents the achievement of results. Partnerships strengthen the pillars by: developing new and innovative ideas for education and awareness; building on increased coordination to ensure efficient management strategies for effective on-the-ground control; creating a larger network to improve surveillance and improve inventory capacity; creating close cooperation and working relations to better evaluate activities and enabling open dialogue to improve effectiveness of activities.

Each of these key pillars is described with examples of notable progress that has resulted from increased funding over the past two years.

Pillar 1: Provincial Networks

As “weeds know no boundaries”, invasive plant infestations often exist in the jurisdictions of more than one land occupier. The role of co-ordination ensures that resource managers unite to address common infestations together.

Management of invasive species is never successful when one land occupier neglects invasive plants, causing seeds from these plants to blow onto a managed neighboring property. When the occupier that is not managing their invasive plants is the Provincial Government, it sends a negative signal to other occupiers with respect to their responsibilities. Further, it is counter-productive when neighbors focus on managing different species or use different control measures. For example, if one land occupier applies biological control agents (insects) to naturally control invasive plants while the neighboring occupier applies herbicide to their invasive plants, neither achieves their goals. Local partnerships are a key component to ensuring that coordination of activities is consistent across the geography of different land tenures and to ensure that there are no gaps in the delivery of management activities. See APPENDIX E for a description of local weed committees and their operation.

Excellent cooperation, through partnerships, has developed between Crown ministries through the IMIPC, the IPC, local regional districts, community weed committees, the private sector, environmental groups and First Nations. In

addition, the establishment of the Invasive Plant Advisory Panel, by Cabinet, has provided recommendations on long term, stable funding and program governance. Collectively, these groups represent most agencies and stakeholders concerned with invasive plant management. Due to the uplift in invasive plant funding in 2004, BC has achieved a level of coordination for invasive plant activity that is unprecedented in the province's history.

For the first time, the Provincial Government has developed a provincial perspective on invasive plants, beyond the specific mandates of each ministry. Such progress was possible through the auspices of the IMIPC. This approach ensured that the highest priority invasive plant sites on Crown land throughout the province were addressed before lower priorities. See APPENDIX C for further details. For example, high priority sites in parks and protected areas received treatment that would not have occurred without the coordinated approach. Further, cross-ministry training occurred with Ministry of Forest and Range staff including Rangers in their invasive plant training exercises, and providing technical support for training of Transportation Maintenance Contractors. Another benefit of increased operational funding and co-ordination was the improved, broader support of local invasive plant committees by government staff. The IMIPC is working to expand these links and develop long-term solutions that will result in improved program coordination and increased local program delivery.

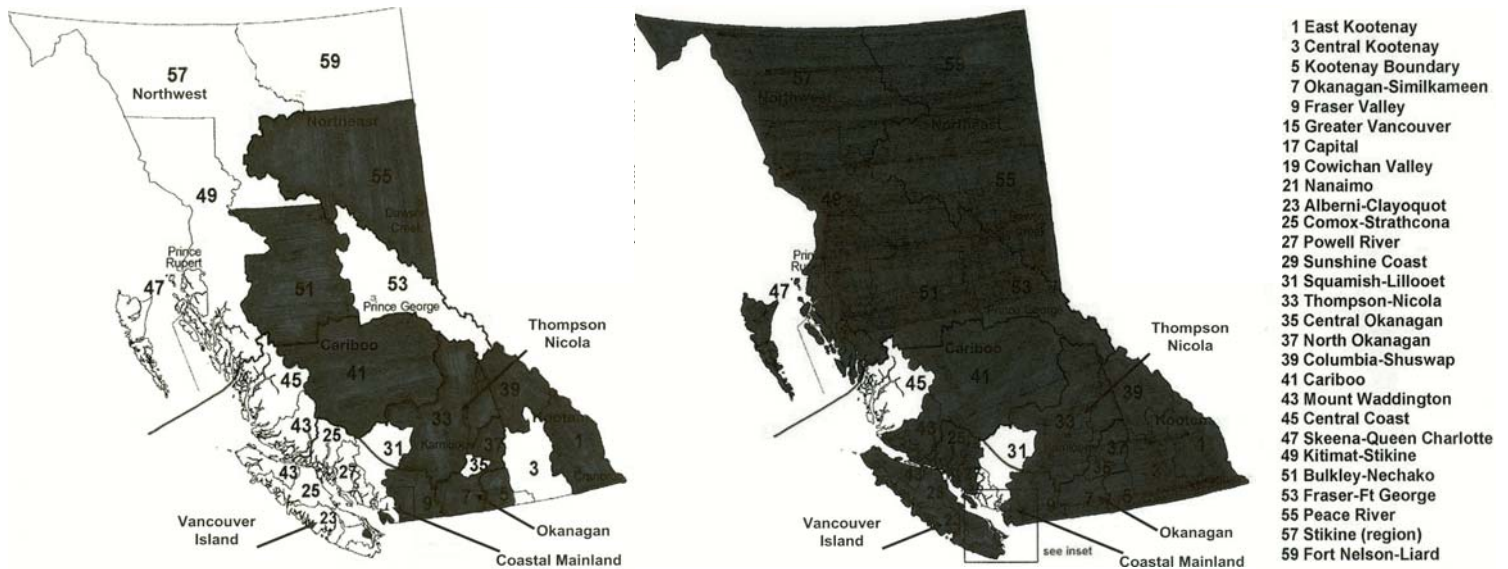
Local government and local groups have expressed concern about downloading of provincial responsibility. The Provincial Government's increase in invasive plant funding since 2004 to address Crown responsibilities has reduced these concerns; evident by the development of new invasive plant committees and participation in the pilot projects. Non-government and local government partners now recognize that neighboring infested Crown sites will be managed, which encourages these occupiers to fund, and in many cases lever additional financial and in kind contributions, to address their responsibilities.

Increased funding has contributed to:

- Establishment of four new local/regional invasive plant committees in the Northwest, Central Interior, Central Kootenay and South Coast. Formation of four more committees is anticipated in 2006. This would effectively achieve near total provincial coverage for locally coordinated efforts by establishing an unprecedented 26 local weed committees or organized weed groups. Improved effectiveness of local committees through increased capacity to network and spread awareness as a result of uplift funding.
- Greater capacity to recruit volunteers and leverage supplementary funding sources through the local delivery model.

- Invasive plant identification and treatment training for highway maintenance contractors, and park rangers.
- Developing, establishing and maintaining a long-term International Weeds Cross Borders Coordinated Management Area Partnership that aims to provide an integrated and coordinated approach to invasive plant management between Canada and the United States by sharing resources for education, training, inventory and control. Ultimately, the partnership will limit invasive and noxious weed seed sources from further infesting both Canada and the United States through traveled waterways, railways and highways.

Figure 1. Presence of Weed Committees throughout BC before 2004 (left) and after increased funding 2004-2006 (right)



Accomplishments of the Invasive Plant Council Due to Funds Provided by the Province

British Columbia is the only province in Canada with an Invasive Plant Council. Federal agencies involved in invasive species management consider our province to be a leader in this area. The Province has provided funds to the Invasive Plant Council to assist with startup of the organization, operations and to fund invasive plant biological control research. The following are some of the accomplishments that have been achieved in part through provincial funding:

- Establishment of the Coastal Invasive Plant Committee (covers all Vancouver Island, North and South Gulf Islands and the Powell River area) and the Greater Vancouver Invasive Plant Working group. Success in establishment is due to time from IPC staff and through direct provincial funding.

- Compilation of a comprehensive list of local government, provincial and federal legislation and regulations that pertain to invasive plants. The IPC is using this information to identify gaps and overlaps in legislation and determine how to improve effectiveness of legislation.
- Development of information to Council members and the development of communication tools for members and others. Communication products include:
 - The Invasive Plant Council website for information sharing about invasive plant management will be interactive and is linked to other sites (www.invasiveplantcouncilbc.ca)
 - Newsletters
 - Series of Council updates
 - Gardener's awareness guide to invasive plants
 - Developing a searchable compendium of invasive plants
- The Council was established and organized at the Invasive Plant Council Forum held in January 2005 in Richmond, BC. At this meeting:
 - Council Board of Directors was formally established
 - Working groups developed invasive plant priorities in the area of:
 - Regulation, Compliance and Enforcement
 - Communications and Awareness
 - Finance and Fund Development
 - Technical and Operational Support
 - Research and Development
 - Networking between all levels of individuals and agencies was facilitated
 - Education about invasive plants and organizations in other areas was part of the program
- Awareness information about invasive plant issues was presented at:
 - International Conferences (Pacific Northwest Economic Region (PNWER), Western Plant Board)
 - First Nations Conferences (First Nations Summit and Union of BC Indian Chiefs)
 - Canada US Weeds Cross Borders Legislative Tour
- Developed collaborative and guiding role with two federal programs with major roles pertaining to invasive plants:
 - The National Forest Strategy
 - The Terrestrial Plants and Plant Pest Working Group
- Providing expert advice to Manitoba and Nova Scotia in the development of Invasive Plant Councils in those provinces.

- In addition to provincial funds, the IPC accesses funds from the Fraser Basin Council, local governments, and private individuals.
- IPC hosting the 2nd Annual BC Invasive Plant Forum in January 2006 as a result of IMIPC uplifts. This event provides an opportunity for stakeholders from private and public sectors, including local, regional, provincial and federal government; utilities; industry to meet and discuss current issues and opportunities for improvement.

Pillar 2: Strategic Prevention/Education/Awareness

Education and awareness play a key role in the prevention of new invasive species being introduced whether it is through better selection by gardeners or landscapers of plantings in landscape sites, better management of disturbed sites by seeding with adaptive and competitive non-invasive species, or reporting a suspicious plant. The increased funding supported the following:

- Educating over 2,000 people about invasive plants at an Environmental Expo in Kelowna, and countless others at 15 field days throughout the Peace River, north central BC, Fort Nelson, Thompson-Nicola, Kootenay Boundary, Central Kootenay and Okanagan in 2004/05.
- Publishing 24,000 colour field guides to aid the public and resource managers in identification of noxious and invasive plants.
- Increased awareness of the risks of invasive plant spread by soil movement from infested gravel pits by Highway's Maintenance Contractors.
- RDEK (East Kootenay Pilot Project) utilized 2300 volunteer hours and achieved on-the-ground control of weed sites in sensitive areas and riparian sites as well as increased public awareness.
- Increased capacity of local invasive plant committees to deliver local education/awareness, as well as improve their partnerships with other groups, agencies and non-government organizations.
- Recent activities such as more public events and field days have increased the level and momentum of public awareness and interest in invasive plants. As a result, the public has elevated their concern for the impact invasive plants have on British Columbia's economy and environment. This has fostered unprecedented support and buy-in to the expanded invasive species initiatives by the provincial government.

Pillar 3: Inventory/Surveillance

Effective surveillance improves the opportunity for early detection/rapid response, which decreases the opportunity for new infestations to establish and existing infestations to enlarge. Significant progress on developing a good inventory of invasive plant sites throughout the province, which had been lacking, enables more effective planning, decision-making, monitoring and evaluation.

Funding uplifts have contributed to:

- Improved inventories that led to identification of new or existing species in previously unknown locations, such as a tansy ragwort site in the Queen Charlotte Islands and velvetleaf in Oliver.
- Increased funding has improved co-ordination and co-operation for more effective delivery of the Ministry of Forests and Range-led *Invasive Alien Plant Program* (IAPP) database, a provincial web-based service to house and provide information on invasive plants and their treatments in BC. The database, launched in the spring of 2005, is accessible by all agencies and groups involved in invasive plant management, as well as the general public, and will result in increased inventories and improved provincial coordination and cooperation among all partners.
- Post-fire invasive plant management plans (inventories, invasive plant treatment, awareness and publicity) to assist in recovery of plant communities in ecologically sensitive areas on Crown land, including provincial parks and protected areas, devastated by the 2003 Okanagan area wildfires.
- The marsh plume thistle management plan (inventory, mapping, and monitoring) for three Northwest region provincial parks and a sulphur cinquefoil management plan for a protected area near Kamloops.
- Inventory and removal of noxious weeds during 2005 in 18 provincial parks and development of a strategy for future management of known affected areas. Monitoring of sites treated in 2004.
- Developing invasive plant management plans for the entire northeast region (Peace River and Northern Rockies Regional Districts) and for the Southern Interior Forest Region.
- Surveying of all invasive plants within the central Vancouver Island area and removal of new infestations where possible.
- Surveying for four new invasive species infestations (hoary alyssum, purple loosestrife, rush skeletonweed and field scabious) throughout the Central

Kootenays. Initiating a region wide education and awareness program to assist in effective management of invasives in the area.

- Comprehensive inventories of all provincial parks and protected areas in the Southwest Coast and the Northwest of BC, including Vancouver Island and the Gulf Islands. This information is essential in the development of an invasive plant management strategy for parks and protected areas throughout the province.

Areas inventoried and/or treated:

Inventories and treatment of existing infestations reduce future spread of species of concern.

- Parks and protected areas in Central and Southern BC, including Lac de Bois Protected Area near Kamloops, and on the Southwest Coast, including Vancouver Island, the Gulf Islands.
- City of Coquitlam
- Cariboo Regional District (RD)
- Inter-tidal habitats in the Fraser River delta and in estuaries along the east coast of Vancouver Island and the Gulf Islands
- Okanagan-Similkameen RD, including Fire sites on Okanagan Mountain, Anarchist (Osoyoos) and Vaseux, including provincial parks and protected areas within or adjacent to fire sites.
- Comox-Strathcona RD
- Central Kootenay RD
- Kootenay-Boundary RD
- Central Okanagan RD
- Peace River RD
- Mid-Skeena Watershed
- East Kootenay RD
- Northwest Region (Stikine RD; Kitimat-Stikine RD; Bulkley-Nechako RD; Fraser-Fort George RD; Skeena-Queen Charlotte RD)
- Thompson-Nicola Regional District

Pillar 4: Government Policy and Funding Support

Adequate commitment for on-the-ground control by government sends a powerful message of responsible stewardship to private land owners and lease holders.

Funding uplifts made it possible for more treatments to take place in 2004/05 and 2005/06. Compared to previous funding levels, the approach was to address all known small infestations of highly invasive species, between Management

Options #2 and #3 in APPENDIX D. Although this approach does not reduce other existing infestations of invasive plants, that will continue to expand by 14% annually, it is a good start.

Eight local governments within the province have established mechanisms for invasive plant control enforcement (either through the *Weed Control Act* or a local government bylaw that references the *Act*). Regional district and municipal councils may appoint inspectors and weed control officers to enforce and administer the *Weed Control Act*; non-government committees do not have the powers to enforce the *Act*. Approximately 750 initial notices were issued in 2004 with voluntary compliance on almost every notice. Where Crown land is not adequately managed, it is problematic to enforce *Weed Control Act* legislation on neighboring occupiers, leading to inadequate management by all.

Some key accomplishments as a result of the increased funding included:

- Controlling Scotch broom, Japanese knotweed, giant hogweed, carpet burweed, sulphur cinquefoil, Himalayan blackberry, dalmatian toadflax, tansy ragwort and other noxious weeds in 16 provincial parks, 7 protected areas, 4 ecological reserves and numerous wildlife management areas throughout British Columbia
- Expansion of invasive plant control on critical highway right-of-way sites throughout the province with increased chemical control in the southern interior and northern regions, increased manual control and mowing in the northwest, wild chervil control in the Fraser Valley and a massive cutting and removal program for scotch broom, gorse, tansy ragwort, giant hogweed and Canada thistle on Vancouver Island
- Successfully containing spotted knapweed, leafy spurge and field scabious in the Northern Interior Region
- Successful containment of perennial pepperweed, and field scabious in the Southern Interior Region
- Successfully defending the US/Canada from the penetration and establishment of jointed goatgrass, yellow starthistle, and crupina, (all provincially listed noxious) due to increased BC surveillance and cross borders partnerships
- Controlling over 20 invasive plant species on over 1400 priority Crown land sites in the southern interior
- Distributing over 140,000 biological control agents (14 insect species against 13 invasive plant species) to over 600 Crown land sites throughout BC

- Researching effective control methods for orange hawkweed
- Surveying and removal of Japanese knotweed and Scotch broom from DeBoville Slough in Coquitlam, along with an education and awareness program
- Spartina inventory of Boundary Bay Marshlands and adjacent estuaries and tidal areas and successful removal of infested areas in 2004. Inventory and removal of recurring sites in Boundary Bay in 2005 and expansion of inventory to the east coast of Vancouver Island and Gulf Islands. Development of a plan for long term monitoring and maintenance of affected areas.
- Increased government funding has led to elevated involvement and partnerships with utility companies in addressing invasive plants. Development of more complete and comprehensive strategies across BC and within specific areas has encouraged utility companies to make the investment to treat their sites and contribute to local weed programs through various education, awareness and prevention activities.

Pillar 5: Research Capacity/Technical Expertise

Improving effectiveness requires the facilitation and application of new research methods, monitoring, quality control and evaluation. Key highlights from increased funding include:

- Support for screening of biocontrol agents for the hawkweed complex and hound's-tongue and survey/collection of six bioagents targeting yellow toadflax and marsh and Canada thistle (Ministry of Forests and Range and Ministry of Agriculture and Lands funded biocontrol research by CABI BioScience, Switzerland - \$128,660)
- Researching methods for mass-producing weed biocontrol agents for distribution to hound's-tongue infested sites in the Southern Interior of BC
- Hiring of contractors to provide better evaluation and monitoring of treatment sites

Conclusions

It is very evident from the many accomplishments and activities outlined in this report, that increased provincial funding is having important impacts in the province. There is an increased awareness of the problems that we face from invasive plants as well as significant advances in management. With the improved inventories developed in the past two years, British Columbia is in the best position ever to strategically move forward.

The tremendous improvements in programs, coordination, cooperation and shared funding presently under way in the 'war against weeds' has caused excitement and anticipation about winning this 'battle'. Over the last three years there have been exceptional efforts by governments, agencies, and private individuals to get a cooperative, coordinated invasive plant program under way in the province. This has happened! We now have the organizations in place and they are working together in a unified way. The IPC has the networks to develop and strengthen partnerships, support local weed committees, focus on education and awareness, and facilitate research and surveillance priorities.

BC is the leader in invasive plant management in Canada. Federal agencies and other provinces (Manitoba and Nova Scotia) are looking to BC to find solutions for their invasive plant issues. British Columbia has:

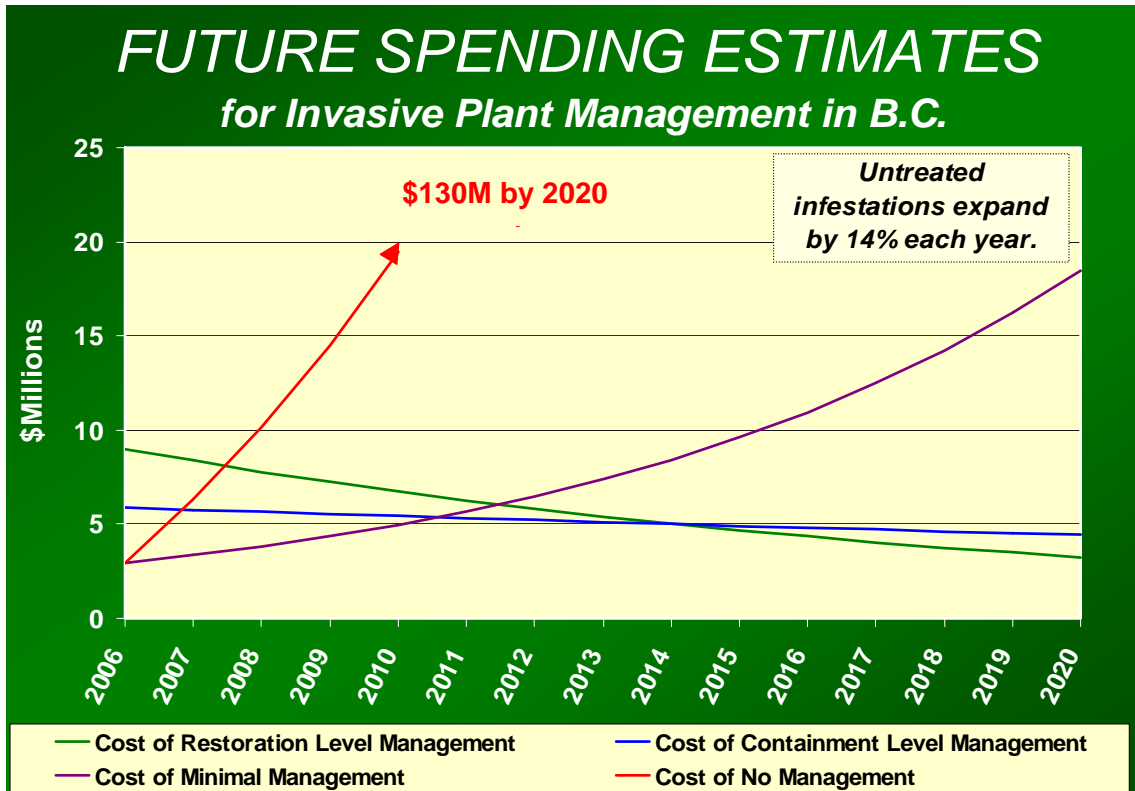
- the only Invasive Plant Council in Canada
- the most comprehensive partnerships and linkages amongst the various stakeholders - the public, resource industries, utility companies, First Nations, environmental groups, local governments, and within provincial ministries
- the most comprehensive invasive plant data base in Canada
- provincial, federal and international research efforts using leading-edge biological control and other environmentally sustainable practices to address key priorities.

With the overall increased awareness of invasive species and recent federal involvement through the National Invasive Alien Species Strategy, there is no doubt that the eyes of the nation will be on BC for our leadership in invasive plant management.

Appropriate provincial funding for operational control and to support the IPC is essential to continue the exceptional progress that has been made, and to turn back the impending invasive plant disaster. Stakeholders will be unwilling to continue their efforts if such a significant player as the provincial government steps aside.

In the absence of adequate funding, effective containment cannot occur, resulting in a 14% expansion of unmanaged infestations every year. Figure 2 illustrates the estimated trend without adequate control.

Figure 2: Estimate of future yearly spending requirements to adequately address invasive plants based on various funding levels.



We do not want to emulate the situation in California, which is now so overrun with invasive plants, that over 8 million ha are moderately to heavily-infested with yellow starthistle. A spiny, very competitive plant that reduces the diversity of native plant communities, yellow starthistle is a prime example of how one species can cause many impacts. Toxic to horses, it reduces forage production for livestock and wildlife, cause roadside weed problems, reduces the quality and yield of crops, and prevents recreational access to infested sites. It is only 30 km from our border with Washington State.

We are truly at a crossroad. Decisions made today will be compounded in the positive, through the synergy and leveraging of committed individuals throughout the province.

APPENDIX A Pilot Projects

East Kootenay Invasive Plant Pilot Project

Introduction

East Kootenay Invasive Plant Pilot Project is a three year integrated weed management program for the areas of the East Kootenay Regional District. Year one identified two components of the Pilot Project Program that were not being addressed within the scope of the Integrated Management Plan for the Project.

Component 1: Control weed infested sites that were: in sensitive ecological habitats, riparian areas, areas contributing to the spread of priority weed species or sources of re-infestation of controlled areas

Component 2: Education and awareness of the public on the economic and ecological impact of invasive plants to the East Kootenay region

Goals

Component 1: Develop a control program for riparian areas, urban areas and sensitive habitats, using non-herbicide control methods that fit the strategic management goals of the East Kootenay Pilot Project

Component 2: Develop a public education and awareness outreach program offering a more complete understanding of invasive plant impacts and what is involved in the East Kootenay Pilot Project

Deliverables

The "Weed Warriors" program was initiated as a community oriented project inviting youth groups and non-profit volunteer and service groups to participate and cooperate with the East Kootenay Pilot Project in the war against invasive plants and weeds.

Youth groups were invited to sign up for a "Riparian Weed Pulling Day" in their communities and non-profit services groups were invited to request an invasive plant "Educational Display Event" be set up at local events and functions and participate in a weed pulling event in their communities.

The "Youth Group Riparian Pulling Events" coordinator, would visit the community youth group and help them identify a weed infested riparian site that could be successfully controlled using only manual hand pulling techniques. An education and awareness presentation on the biology and impacts of invasive

plants was given to the youths and other volunteers, followed by an organized weed pull.

Volunteers that participated in a "Weed Warrior Pulling Event" were provided with gloves, garbage bags, and refreshments. To thank community minded groups for their efforts, each volunteer was given a "Weed Warriors" t-shirt and the hosting youth group or community service group was presented with a \$250 donation. Community and environmentally minded businesses in the East Kootenays donated the supplies needed for this project. Top Crop and Interior Reforestation provided grass seeds, Home Hardware donated gloves and garbage bags, and Save-on-Foods provided refreshments. Events lasted four to five hours with local businesses donating snacks and lunches to volunteers at the pulling event.

The "Service Group Education and Awareness and Weed Pulling Events" coordinator, developed an Invasive Plant Display with weed control and identification information to set up a booth for public display at a community event. Following the event, volunteers would participate in an organized weed pull at a weed infested site in the community.

To compliment the pulling and education components of the "Weed Warriors Program", newspaper articles and press releases were published in local papers to notify East Kootenay residents of "Weed Warrior Events". A weed information hotline (1-866-WEEDWAR) was established to field calls on requests for weed information, to report new sites of invasive plants in the East Kootenay region or to register as a host group for a weed pulling day.

Outcomes

Youth Group Riparian Weed Pulling Program

Between July and September, 16 different weed events in 10 communities took place throughout the East Kootenays. Over 300 volunteers participated in these events, accumulating over 1,100 person hours hand pulling weed infested sites. Over 16 businesses participated as sponsors for the local events.

Education and Awareness and Service Group Weed Pulling Program

Between July and September, 16 educational events in 15 different communities were presented throughout the East Kootenays. Over 250 participants attended these events accumulating over 1,000 person hours in the hand-pulling of weed infested sites.

800-WEEDWAR Hotline

From June to the end of September, over 800 calls were received from the general public reporting weed sites or requesting weed or program information.

In-Kind Business Participation

Major Sponsors at Hand Pulling Events:

- Save-On Foods provided juices, water and beverages
- Top Crop Feeds and Interior Reforestation provided grass seed mixes for re-vegetating weed infested areas at pulling events
- Home Hardware provided gloves, tools and garbage bags for pulling events
- Many community business

Northwest Invasive Plant Council Pilot Project

Introduction

The Northwest Invasive Plant Council (NWIPC) is a non-profit organization that formed for the purpose of managing invasive alien plants in Northwest BC. By preventing invasive plant establishments and controlling existing infestations, negative economic and environmental impacts to forest, agriculture, tourism and recreation industries, First Nations, public health and wildlife can be reduced. The NWIPC is one of two three-year pilot projects funded by the provincial government to assess the efficacy of managing invasive plants through regionally specific local delivery models.

Jurisdiction

The NWIPC is now successfully completing the first year of the Pilot with many accomplishments and a positive direction for the next two years. The NWIPC's operating area extends west of the Rockies to the Queen Charlotte Islands and north of Quesnel to the Yukon border. For the 2005 field season, invasive plant management occurred in nine weed management areas within the Northwest, including: 1) Cassiar, 2) Hazelton, 3) Houston, 4) Prince George, 5) Prince Rupert, 6) Terrace, 7) Valemont, 8) Vanderhoof and 9) the Queen Charlotte Islands.

Structure

The efforts of invasive plant interest groups within these areas are coordinated by the NWIPC Board of Directors and Program Manager, including activities such as inventories and treatments of invasive plant sites and education and awareness. "Projects funded by the NWIPC for the 2005 field season brought

depth and a community-based perspective to the pilot project,” said the Project Manager.

2005 Accomplishments in the Northwest

- 1) Gitxsan Nations ‘*Weeding Out the Invaders*’ program
 - a. Two-person student summer crew
 - b. Students successfully passed pesticide applicator course, which lead to the application of the Gitxsan’s first Service Licence for the Mid Skeena Watershed
 - c. Field crew trained in plant identification and data management
 - d. 72 inventories conducted in local communities and along major road networks
 - e. Inventory map developed to indicate invasive plant distribution and severity
 - f. Developed and distributed a community newsletter titled “*Weeding Out The Invaders*” increase public awareness about invasive plant issues
 - g. Display at the local event, *Pioneer Days*, hosted in Old Hazelton (weed samples displayed and questions answered by students)
 - h. Distributed information packages to surrounding reserves, to assist in the establishment of invasive plant projects in other First Nations communities
 - i. The Gitxsan intend to pursue further funding to continue their invasive plant management efforts in 2006/07 where they intend to train 20 summer students from the 14 House Groups of the Mid Skeena Watershed in invasive plant inventories, control and monitoring methods and education and awareness

- 2) Successfully tested the Invasive Alien Plant Program (IAPP) database
 - a. Announced by Ministries of Forests and Range and Agriculture and Lands in October 2005
 - b. Web-based data entry system and mapping tool intended to coordinate invasive plant management efforts throughout the province by providing information and maps that identify invasive plant sites, control methods and restoration needs

- 3) Established and maintained a toll-free hotline for invasive plant reporting, public identification requests, public complaints and distribution of educational information

- 4) Improved regional invasive plant awareness
 - a. Info booths at fairs and exhibitions
 - b. Advertising through local newspapers, radio, television interviews
 - c. Mailing out information packages to the general public
 - d. Presentations to local municipalities/regional districts

- 5) 4-H Clubs Potted Weed Display to raise awareness about invasive plant identification, one of many NWIPC initiatives
- 6) Two co-op students hired from University of Northern BC for the summer
- 7) Completion of inventories in provincial parks and protected areas
- 8) Expanding membership - more municipalities and regional districts getting involved in the management of invasive plants
- 9) Successful completion of the first year of the local delivery pilot model, providing the public with a single agency point source and effectively coordinating operational and educational activities for the region

APPENDIX B

Local government and community weed management agencies that became involved or increased involvement as a result of increased provincial funding commitments:

- City of Coquitlam
- Cariboo RD
- Ducks Unlimited Canada
- Boundary Weed Management Committee
- South Okanagan-Similkameen Invasive Plant Society
- Comox Valley Naturalists Society
- Regional District of Comox Strathcona
- Central Kootenay Invasive Plant Committee
- Friends of DeBoville Slough
- Nature Trust of BC
- Como Watershed Group
- District "C" Farmer's Institute
- Southern Interior Weed Management Committee
- Northwest Invasive Plant Council
- Fraser-Fort George RD
- Bulkley-Nechako RD
- Kitimat-Stikine RD
- East Kootenay Invasive Plant Committee
- East Kootenay RD
- Gitxsan First Nation
- Ktunaxa-Kinbasket First Nation
- Peace River RD
- Invasive Plant Council of BC
- Fraser Basin Council
- Central Okanagan RD
- Prince George RD
- Canadian Wildlife Services
- Okanagan County Noxious Weed Control Board, US
- Agriculture and Agri-Food Canada
- Creston Valley Beef Growers Association
- Columbia Basin Fish and Wildlife Compensation Program

Appendix C

Provincial Priority Matrix for Invasive Plant Management

The IMIPC agrees in principle with a provincial priority matrix, developed through a joint initiative between Parks Canada, the Northwest Invasive Plant Council and the Ministry of Forests, which helps program managers determine management priorities and resource allocation. The priority assigned an invasive plant infestation is determined by combining two factors: the invasive plant category and the site priority.

For example, rush skeletonweed (Category 1) found in a new area (Priority 1) is ranked as 1-1 or an extremely invasive plant in an extremely high-risk site and is therefore of top concern. The matrix ranking is flexible and is reviewed on an ongoing basis. Program plans developed using this matrix, will recognize regional variations in species priorities and, to some degree, agency priorities for funding allocation. For example, the Ministry of Transportation manages the control of invasive weeds along a linear corridor where spread of undesirable plants can be very rapid. The Ministry of Environment may require special consideration for specific wildlife or habitat management issues such as streamside protection and protection of cultural and recreational values.

Invasive Plant Categories

Noxious weeds are placed into four separate categories reflecting their level of overall threat to the resources of the province. Each forest region in the province has their version of this matrix that accounts for local variation in invasive plant distribution and relative risk posed to native habitat.

Table 3: Invasive Plant Priority Categories

Category 1 Extremely Invasive	Category 2 Very Invasive
Includes: Rush skeletonweed Sulphur cinquefoil Leafy spurge Marsh thistle Spotted knapweed Dalmatian toadflax Perennial pepperweed Gorse Scotch broom Yellow starthistle Common Bugloss (Anchusa) A 'lumped' grouping containing: weeds that are present in the province but not a lot is known about them; weeds not yet in the province or not yet on Crown land; all potentially new threats.	Includes: Diffuse knapweed Hound's-tongue Blueweed Canada thistle Plumeless thistle Hawkweeds Scentless chamomile Field scabious Common tansy Tansy ragwort Purple loosestrife

Table 3 (cont.): Invasive Plant Priority Categories

Category 3* Invasive	Category 4* Aggressive or Under Biocontrol
Includes: Burdock Russian knapweed Common toadflax Bull thistle	Includes: Nodding thistle

Examples of these two categories are given here. The full extent of these two categories is not outlined.

Invasive Plant Sites Priorities

Invasive plant sites are ranked according to priority. The definitions of the four priorities are:

Priority	Purpose/Intent of Treatment
1 Extremely High Risk	To stop the spread of weeds threatening currently uninfested, highly susceptible areas. These sites are less than or equal to 0.25 ha. This priority also includes sites that are threatening a large neighboring economic base, for example, the seed crops of the Peace River.
2 High Risk	To stop the enlargement of sites in highly susceptible areas. These sites are less than or equal to 0.5 ha.
3 Moderate Risk	To stop the enlargement of sites of greater than or equal to 0.5 ha in highly susceptible areas or of less than or equal to 0.5 ha in moderately susceptible areas.
4 Low Risk	To stop the enlargement or contain sites in moderately susceptible areas of greater than or equal to 0.5 ha.

Table 4: Ranking Matrix

Weed Category	Site Priority	Management Level
1	1	Critical (Minimum)
1	2	
1	3	
2	1	
2	2	Containment
2	3	
3	1	
1	4	Restoration

The IMIPC will give highest funding priority to invasive plant management projects falling within the minimum program level. This system is also

recommended for use by local weed committees/regional districts to identify and address priorities. See APPENDIX D for a description of the management options.

APPENDIX D

Management Options for Invasive Plants and Their Outcomes

1. No Management

Spending: \$0 as of 2007

Goals: None

Actions: None

Outcome: Increase in cost each year to manage untreated infestations that expand by 14% annually, in addition to the absent base spending of \$2.95M, due to new invasive species becoming established in BC and existing infestations being permitted to increase in size and density.

2. Minimum

Spending: \$2.95M in perpetuity

Goals:

1. Eradicate new introductions
2. Partial containment of small to medium-sized established infestations of highest priority species

Actions:

1. Prevent (education/awareness) and/or eradicate (operational) new invading species from becoming established in the province
2. Prevent and/or eradicate established species from becoming established in new regions of the province
3. Contain established infestations of highest priority species

Outcome: Increase in cost each year to manage infestations that expand by 14% annually due to limited containment of existing infestations, which continue to increase in size and density overtime. Cost will double after the first five years, double again after the next four years, then double again after the next three years.

3. Containment

Spending: \$5.9M for the first four years to be gradually decreased over time due to reduced infestations

Goals:

1. Eradicate new introductions
2. Full containment of all small to medium-sized established infestations

Actions:

1. Minimum management
2. Full containment of small to medium-sized established infestations

Outcome: Approximately 2% decrease in cost each year due to full containment of infestations and slow, small-scale restoration of previously affected land.

4. Restoration

Spending: \$9M for the two year to be decreased overtime as a result of reduced infestations and increased restorations

Goals:

1. Eradicate new introductions
2. Full containment of all small to medium-sized established infestations
3. Significant reduction of total infested area due to restoration, resulting in productive land

Actions:

1. Minimum management
2. Containment management
3. Restoration of previously affected areas, beyond control measures, to increase land base value

Outcome: Approximately 7% decrease in cost each year due to full containment of infestations and rapid, large-scale restoration of previously affected land (reverses the impacts of invasive plants).

APPENDIX E

Weed Committees and their Operation

Committee Membership

Local Community Committees

Examples of local community committees include the Boundary Weed Management Committee, Southern Interior Weed Management Committee, South Okanagan-Similkameen Invasive Plant Society, and the Central Kootenay Invasive Plant Committee.

These committees include representatives from government agencies, industry and identified sectors within the community. The following list describes a typical group composition:

- First Nations community representative
- Two agriculture producer organizations
- A public sector agriculture organization
- A conservation-focused environmental organization
- A naturalist-focused environmental organization
- A public sector environment organization
- A forestry small business private sector organization
- A forestry major licensee private sector organization
- Two Ministry of Forests and Range District Offices
- A public sector highways organization
- A public or private sector mining organization
- An urban municipal government organization
- A rural municipal government organization
- A public sector parks organization
- A private sector recreation organization
- A railway organization
- A utility organization

Regional District Weed Committees

Regional District Weed Committees are appointed by the Regional District Board as per the *Weed Control Act*, Sec. 9.1. Often the Board or weed committee will request representation from selected groups or associations or agencies. These committees vary in their membership across BC.

Setting Committee Priorities

Committees set priorities by consensus in most cases. Members bring their concerns to the table and use information from: inventories, historical site info,

historical observation from locals, input from agency representatives and land managers, and coordinator knowledge of the region or area. The groups use existing and accepted prioritization tools such as the Ministry of Forest and Range matrix for weed species (see *APPENDIX C*), established criteria for overall species and site evaluation methods, and consider available budgets to collectively determine which weed species in specific areas and/or sites are high priorities, as well as other committee activities.

Procedures for Treatment

Local Weed Committees

Community weed committees usually do not get directly involved in treatment. They may facilitate treatment for certain areas of Crown or private land by negotiating opportunities for treatment. Committees and their coordinators may identify and prioritize areas requiring treatment and arrange for contractors to treat under an agency Pest Management Plan. This is done through discussion with the tenure holder, the agency, or the individual responsible for treatment of specific lands. Co-ordinators are often responsible for treatment evaluations as well. However, committees have rarely been responsible for developing and issuing the treatment contract or for paying out on the services rendered. This is done by the tenure holder or agency responsible. Committees facilitate the work whatever way they can. The South Okanagan-Similkameen Invasive Plant Society is an exception to this, with the Okanagan Mountain Project funded by the Inter-Ministry Invasive Plant Committee in the last two years. This was done in coordination with all agencies.

Regional District Weed Committees

The approach to treatment by these committees varies across the province. Some conduct no treatment. Some make treatments on their own regional district lands under a Pest Management Plan (PMP) or Endorsement by the Ministry of Environment. Some conduct treatments under their program on their own regional district lands for utility Right of Ways under their PMP, or through another agency's PMP. Some regional districts have a cost share program with private land owners for treatment, and some hire a contractor for weed control on private land, for private land owners in the rural areas of the regional district.

Roles in Prevention

Prevention of invasive plants and new invader species is achieved through the education and awareness gained by increasing overall knowledge on how to recognize invasive plants and methods of their spread, and by creating awareness about the negative impacts caused by these invaders.

Generally all members of any committee are advocates of education and awareness programs in which the committee is involved. They will assist in disseminating education and awareness information, contribute financially to education and awareness initiatives undertaken by committees, host field days, may offer in-kind assistance to facilitate education and awareness initiatives, and provide overall assistance as appropriate.