



DRAFT Issues & Alternatives Document

INVASIVE SPECIES

June 1, 2007



Japanese Knotweed (*Polygonum cuspidatum*)

Yellow Flag Iris (*Iris pseudacorus*)



Eurasian water milfoil (*Myriophyllum spicatum*)

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Chilliwack River Watershed Strategy Issues & Alternatives:

INVASIVE SPECIES

1.0 General Description of the Issue

Invasive species are considered to be the second greatest threat to biodiversity in British Columbia, next only to habitat loss¹. Although sometimes called “exotic”, “alien”, or “introduced” species, in this report we specifically refer to any species of plant, mammal, amphibian, fish, insect, disease, etc., that has been intentionally or accidentally introduced to an area, and demonstrates some competitive advantage over the native species. The resultant population expansion of the invasive species often results in the displacement of local species and in an ecological imbalance. Once established, the effects of invasive species are often irreversible, and attempts at eradication or control can be very difficult and costly; therefore, prevention and early detection with rapid response are often the keys to invasive species management. Note that although they could technically be considered as invasive species in a certain context, domestic animals such as cats and dogs are not considered in this report.

Some of the impacts associated with the introduction and subsequent spread of invasive species include:

- Reduced biodiversity of native flora and fauna, including species-at-risk (through competition for space and or resources, direct predation on native species, hybridization, introduction of diseases or parasites, etc.)
- Reduced stability or balance within biological communities and habitats (e.g., pine beetle infestations resulting in increased forest fire potential or hydrological changes)
- Potential losses of culturally-significant species or habitats
- Economic impacts due to losses of native species or crops (e.g., pests or diseases affecting forestry or agricultural products)
- Economic losses due to invasive species removal programs
- Reduced aesthetic quality and recreational opportunities
- Potential human health concerns (e.g., giant hogweed, West Nile Virus).

Invasive species can be introduced to an area through a number of intentional or unintentional activities:

- Intentional:
 - Landscaping/beautification projects
 - Personal gardens, planters, or aquariums
 - Restoration or stability projects (e.g., Common crown-vetch commonly used along highways to stabilize slopes)
 - Personal or government intentional introductions for economic or recreation opportunities (e.g., sport fish)
 - Intentional introductions as a form of biological control

¹ Wallin et al, 2004

- Accidental:
 - Ship ballast water
 - Stowaways in imported or introduced products (cattle feed, horticultural imports, etc)
 - Physical spread due to human transport or activities (car tires, railway cars, bottom of shoes, heavy machinery used for habitat restoration projects, etc)
 - Spread by animal (fur, droppings, etc) or natural (wind, water) vectors (particularly of note is the expected spread of invasive riparian plant species such as Japanese knotweed within the Chilliwack River watershed through seed dispersals due to recent flooding events within the watershed)
 - Improper control or disposal of invasive species on personal property (e.g., compost piles, waste sites).

Although anthropogenic activities are mostly responsible for the original introduction of invasive species into an area, the subsequent spread of the species into the surrounding landscape are largely due to rapid reproductive and dispersal abilities of the species. These dispersal abilities often utilize various wind, water, and animal vectors, which often function at the watershed level. Similarly, extreme habitat conditions, such as those often found along mountain ridges that define individual watershed boundaries, can provide natural barriers to the spread of certain invasive species. Consequently, dispersal of invasive species is more likely to occur longitudinally within a watershed than laterally across watersheds. As a result, management of invasive species is best performed at a strategic watershed-scale rather than site-by-site management or management by political boundaries. This emphasizes the importance of addressing invasive species as part of the Chilliwack River Watershed Strategy.

2.0 Specific Location/Examples

Although no comprehensive survey of invasive plants have been conducted within the entire Chilliwack River Watershed, some area-specific bioinventories as well as personal observations can be used to compile a rough snapshot of invasive species in the watershed (Table 1). Further research and follow-up field investigations would be required to verify the presence of these species, as well as any trends in population distributions over time.

Table 1. Inventory of invasive species' observations/recordings within the Chilliwack River Watershed. Information sources are referenced at the bottom of the table. Note that this list is not comprehensive, does not necessarily indicate the current status of species or species' locations within the watershed, and has not been verified beyond consultations with Project Team members.

Species	Where Observed	Priority Class ²	Ref
Plants:			
Bladder campion (<i>Silene cucubalus</i>)	Ryder Lake Uplands	D	1
Butterfly-bush (<i>Buddleja davidii</i>)	Ryder Lake Uplands; riparian area and river bed of lower reaches	D	1;6
Canada thistle (<i>Cirsium arvense</i>)	Ryder Lake Uplands; along mainstem, Tamihi Cr., Slesse Cr., Chipmunk Cr., Foley Cr., Nesakwatch Cr., Borden Cr., eastern edge Chilliwack Lake	B	1;8
Bull thistle (<i>Cirsium vulgare</i>)	Little Tamihi Cr., Nursery Cr., along Chilliwack River near Chipmunk Cr., Nesakwatch Cr.	B	8
Burdock species (<i>Arctium spp</i>)	Along mainstem, Tamihi Cr. Watershed, Ryder Creek.	B	8
Clover (<i>Trifolium repens</i>)	Ryder Lake Uplands		1
Common tansy (<i>Tanacetum vulgare</i>)	Along road networks throughout watershed (from lower reaches to eastern side Chilliwack Lake)	A	8
Common velvetgrass (<i>Holcus lanatus</i>)	Ryder Lake Uplands	D	1
Creeping buttercup (<i>Ranunculus repens</i>)	Ryder Lake Uplands	C	1
English Ivy (<i>Hedera helix</i>)	Patches throughout area	C	6
Eurasian water-milfoil (<i>Myriophyllum spicatum</i>)	Just outside planning area (Cultus Lake, Sweltzer Creek, Great Blue Heron Reserve), with potential to spread		6,7
European mountain-ash (<i>Sorbus acuparia</i>)	Ryder Lake Uplands		1
Giant hogweed (<i>Heracleum mantegazzianum</i>)	Isolated patches	A	
Himalayan and Evergreen blackberry (<i>Rubus discolor, R. laciniatus</i>)	Ryder Lake Uplands; in patches throughout area, particularly in riparian	A	1;6
Holly (<i>Ilex aquifolium</i>)	Ryder Lake Uplands	B	1
Japanese Knotweed (<i>Polygonum cuspidatum</i>)	Chilliwack Lake Park; Thompson Park; mainstem near Tamihi Cr.	A	5;6;8
Mullein (<i>Verbascum thapsus</i>)	Along mainstem near Pierce Creek	C	8
Oxeye daisy (<i>Leucanthemum vulgare</i>)	Ryder Lake Uplands; mainstem near Pierce Cr., Slesse Cr., eastern edge Chilliwack Lake	B	1;8
Purple Loosestrife (<i>Lythrum salicaria</i>)	Areas of the Canal and Edwards Road	A	6
Queen Anne's lace (<i>Daucus carota</i>)	Ryder Lake Uplands	C	1
Reed canarygrass (<i>Phalaris arundinacea</i>)	Ryder Lake Uplands	A	1
Roberts geranium (<i>Geranium robertianum</i>)	Ryder Lake Uplands	B	1
Scotch broom (<i>Cytisus scoparius</i>)	Ryder Lake Uplands; Chilliwack Lake Park; Tamihi Creek, around Centennial Channel	B	1;5;8
Sheep sorrel (<i>Rumex acetosella</i>)	Ryder Lake Uplands	D	1
Small-fruited bulrush (<i>Scirpus microcarpus</i>)	Ryder Lake Uplands		1
St. John's-wort (<i>Hypericum perforatum</i>)	Ryder Lake Uplands; Tamihi Cr., mainstem between Ryder Cr and Nesakwatch Cr., Slesse Cr., east side Chilliwack Lake	B	1;8
Sticky cockle (<i>Silene noctiflora</i>)	Ryder Lake Uplands		1

² Priority Class for invasive plants is a ranking from A (worst) to E (least), based on both the invasiveness of the plant (potential for spread) and the difficulty in management. Rankings were prepared specifically for biogeoclimatic zones of coastal BC (Hallworth, J., Personal Communication).

Species	Where Observed	Priority Class ²	Ref
Stinging nettle (<i>Urtica dioica</i> ssp. <i>dioica</i>)	Ryder Lake Uplands		1
Tansy Ragwort (<i>Senecio jacobaeae</i>)	Along Chilliwack Lake Road up to Park and other roads throughout watershed	B	2
Thyme-leaved speedwell (<i>Veronica serpyllifolia</i> var. <i>serpyllifolia</i>)	Ryder Lake Uplands		1
Wall lettuce (<i>Lactuca muralis</i>)	Ryder Lake Uplands		1
Wild Chervil (<i>Anthriscus sylvestris</i>)	Isolated patches in lower reaches	A	2
Yellow Flag Iris (<i>Iris pseudacorus</i>)	Just outside planning area (upper portion of Sweltzer Creek), with potential to spread	A	7
<i>Fish:</i>			
Black Crappie (<i>Pomoxis nigromaculatus</i>)	Chilliwack R. (1995), Ryder Lake (2003)		3
Brook Trout (<i>Salvelinus fontinalis</i>)	Greendrop Lake (1974), Lindeman Lake (1974); upper Tamihi Creek.		3;7
Brown Bullhead (<i>Ameiurus nebulosus</i>)	Chilliwack R. (1995), Ryder Lake (1985)		3
Carp (<i>Cyprinus carpio</i>)	Lower Chilliwack/Vedder (1995)		3
<i>Mammals:</i>			
Eastern grey squirrel (<i>Sciurus carolinensis</i>)	Residential areas particularly in lower reaches		6
<i>Birds:</i>			
European starling (<i>Sturnus vulgaris</i>)	Widespread, common around Thompson Park and d/s		6
<i>Amphibians:</i>			
Bullfrog (<i>Rana catesbeiana</i>)	Outside planning area, near Royalwood Golf Course		6
Green frog (<i>Rana clamitans</i>)	Outside planning area, amongst ponds near Vedder		6
<i>Insects:</i>			
Mountain Pine Beetle (<i>Dendroctonus ponderosae</i>)	Patchy distribution throughout watershed; Chilliwack Lake Park around campground; of note is relatively large patch on east side of Chilliwack L.		9;4;5
Douglas-Fir Beetle (<i>Dendroctonus pseudotsugae</i>)	Endemic, patchy distribution throughout watershed		9
Spruce Beetle (<i>Dendroctonus rufipennis</i>)	Isolated patches within watershed		9

References utilized for invasive species observations:

1. Trask and Northrup, 1994.
2. Fraser Valley Regional District's Noxious Weed Control Program website.
3. Community Mapping Network's Invasive Species Atlas website.
4. BC Ministry of Forests and Range MapView website.
5. Wiebe, J., Personal Communication.
6. Gadsden, G., Personal Communication.
7. Barnes, D., Personal Communication.
8. MOFR Invasive Alien Plant Program – Map Display website.
9. Johnsrude, A., Personal Communication.

3.0 Contributing Factors/Causes

The following factors are suggested as potential contributing causes for either the current or future status of invasive species within the Chilliwack River Watershed:

- Recreation activities (most notably off-road motor vehicles) within the watershed
- Increased road and motor vehicle traffic
- Development and land use activities that result in habitat disturbances and ecological instabilities
- Improper disposal of yard/garden waste
- Insufficient knowledge of extent of problem (what species, where, how much, what impacts they have on local flora/fauna, future risk)
- Lack of awareness by residents/landscapers/planters/government authorities to not plant invasive species or how to control the spread of horticultural species
- Difficulty in identification or eradication/control of established species
- Lack of a “watershed” event or dominant species to raise the public awareness and concern towards this issue
- Inadequate legislation and/or coordination between responsible government agencies
- Deliberate, or intentional introductions/releases
- Flooding
- Climate change.

4.0 Overall Level of Community Concern

As this issue was not explicitly raised during the public outreach activities conducted in December 2005, concern over invasive species within the Chilliwack River Watershed appears to be relatively low at this time. This level of concern could increase in the future however with the introductions of additional species, the continued spread of existing invasive species, changing landuse patterns or intensity, or changing conditions due to large-scale processes such as climate change.

Although outside of the CRWS planning area, Eurasian Watermilfoil (EWM) is a huge concern in Cultus Lake, and to a lesser extent, upper Sweltzer Creek. Milfoil was first discovered in Cultus Lake in 1977 and now covers almost 30% of the littoral zone in the lake. EWM can encroach on spawning areas and can potentially affect predation on juvenile sockeye by providing habitat for sockeye predators. Large patches of EWM can also cover swimming areas and beaches affecting tourism and property values. Consequently, Eurasian Watermilfoil is a significant issue for the region, and is of high concern by the local community, albeit not directly found within the Chilliwack River Watershed planning area.

5.0 Past and Current Policies or Actions to Address the Issue

5.1 *FVRD's Noxious Weed Control Program*

The Fraser Valley Regional District's Noxious Weed Control Program, partially funded by the Ministry of Agriculture and Lands and the BC Ministry of Transportation, serves to control the spread of wild chervil and tansy ragwort within the region. These species were originally targeted because of their concern to agricultural interests, particularly to cattle and honey bees. Wild chervil and tansy ragwort are present within the Chilliwack River Watershed, but not to the level of concern found in other more agriculturally-dominant areas within the Fraser Valley Regional District such as Matsqui and Sumas. Other invasive species, including species of potentially more concern within the Chilliwack River Watershed such as Japanese knotweed and giant hogweed, are also included in this program, but only as funding permits.

Complaints or observations of noxious weed outbreaks are made to the Fraser Valley Regional District (604-702-5000 or weeds@fvr.bc.ca), where weed control staff, primarily consisting of summer Co-op students, record the complaint and respond. Figure 1 shows the locations of recent noxious weed observations and subsequent removals from areas within the Chilliwack River Watershed. If the weed is along a roadside or certain Crown lands, the location is recorded, the weeds are either pulled or sprayed, and follow-up is scheduled to ensure successful eradication. If the noxious weeds are located on private property, landowner contact is made, and advice is provided for how the weeds should be removed. Bags and bag pickup service (for subsequent incineration) are also provided to the landowner. If landowners do not comply, the issue can be forwarded to the Province for legal action.

More information on the Fraser Valley Regional District's Noxious Weed Control Program can be found on the FVRD Weed Control website: <http://www.fvr.bc.ca/FVRD/Services/Weed+Control/>.

5.2 *FVRD Parks Invasive Species Management Strategy*

FVRD Parks controls the introduction and subsequent spread of invasive species within Regional District parks. Thompson Park and the Cheam Ridge Trail are the two FVRD parks within the Chilliwack River Watershed; however, only Thompson Park is considered to be vulnerable to the introduction of invasive species.

FVRD Parks attempts to prevent introductions of invasive species by immediately cleaning up dumped yard waste, by educating and discouraging the public from intentional releases of potentially invasive species, by being careful to use "clean" soil when it is trucked in for various projects, and by controlling observed invasive plant species through either pulling, spraying, or biological control techniques.

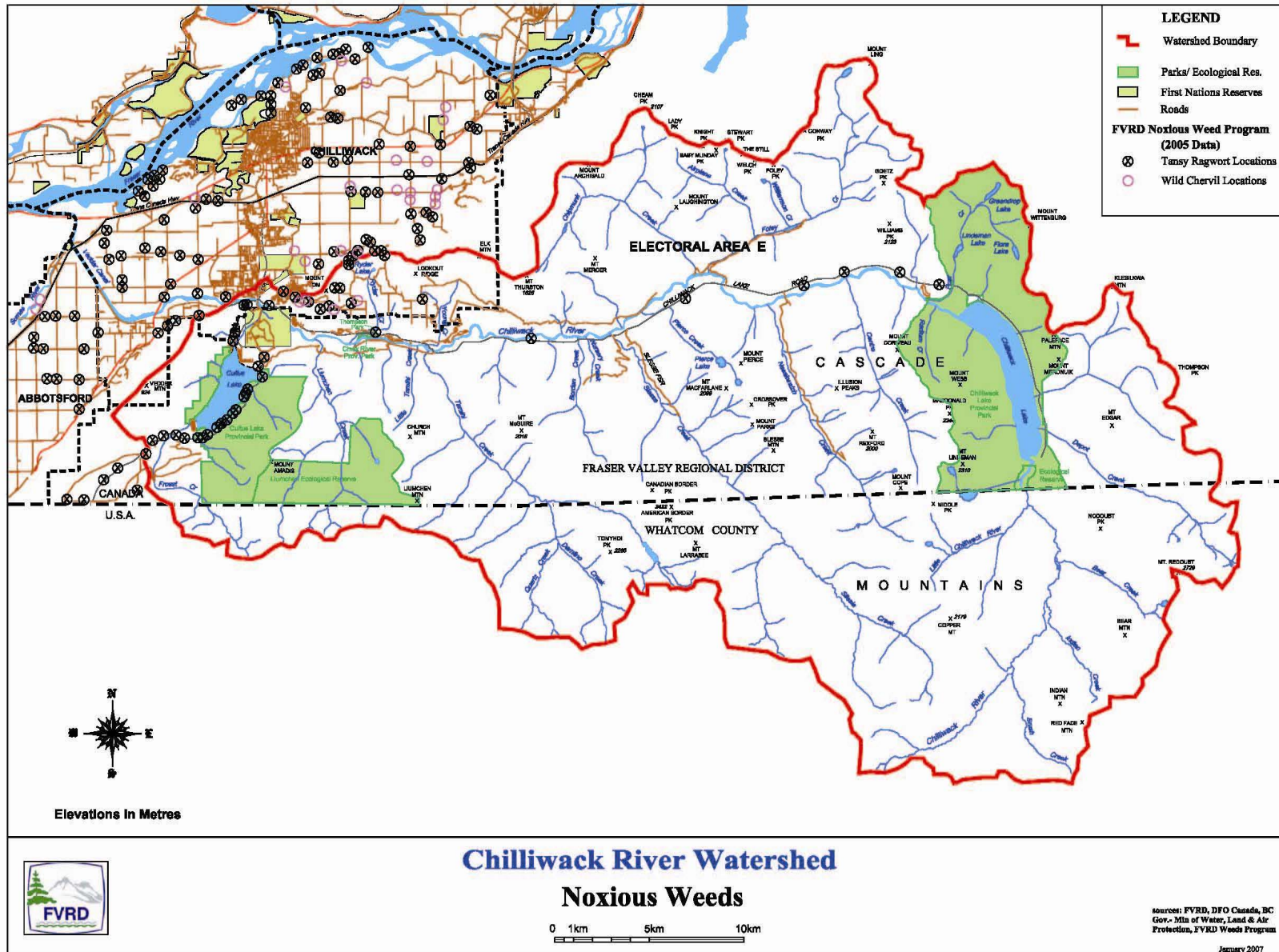


Figure 1. Locations of wild chervil and tansy ragwort occurrences within the Chilliwack River Watershed, as recorded by the Fraser Valley Regional District's Noxious Weed Control Program (2005 data).

5.3 *Canada's Invasive Alien Species Strategy*³

As a result of invasive alien species being identified as a priority for action under the Canadian Biodiversity Strategy, several federal and provincial government departments and agencies established the creation of 'An Invasive Alien Species Strategy for Canada' in 2004. This Strategy outlines a hierarchical approach to invasive species management, through:

1. prevention of new invasions,
2. early detection of new invaders,
3. rapid response to new invaders,
4. management of established and spreading invaders.

Goals, key actions, and priorities are established to help achieve each of these objectives.

Following from this Strategy, the federal government established an Invasive Alien Species Partnership Program. The goal of this program is to provide funding support of up to \$50,000 to agencies or organizations involved in preventing, detecting, and managing invasive species in their local area. As outlined in the Program's Application Guidelines⁴, activities eligible for funding under the Invasive Alien Species Partnership Program include:

- Developing and implementing initiatives (e.g., codes of conduct, best practices, rescue/disposal programs, workshops, community events) that target stakeholders (e.g., growers, importers, retailers), consumers (e.g., ornamental garden trade, wildlife/pet trade, aquarium and water garden trade, live food fish trade, bait fish trade), or activities that contribute to the spread of invasive alien species (e.g., recreational boating, off-road vehicles, hiking, moving firewood).
- Developing and disseminating information products to help different groups (e.g., stakeholders, the general public, technical audiences) to identify invasive alien species through, for example, identification keys, technical bulletins, and taxonomic monographs.
- Developing and distributing educational curricula for secondary schools in partnership with the provinces and stakeholders, including teachers' associations.
- Developing and conducting surveillance (early detection and monitoring) programs designed to detect invasive alien species.
- Developing and implementing targeted eradication, containment, and control projects for high-profile invaders where management interventions (e.g., biological control, weed-pulling, integrated pest management) have a high probability of success and offer an opportunity to showcase a success story.

5.4 *BC's Invasive Alien Species Framework*

The BC Ministry Environment prepared a framework for invasive species management in BC called "Invasive Alien Species Framework for BC: Identifying and Addressing

³ Government of Canada, 2004. Available: <http://www.cbin.ec.gc.ca/issues/ias.cfm?lang=e> (Feb 8, 2007).

⁴ Government of Canada Invasive Alien Species Partnership Program Application Guidelines. Available: http://www.cbin.ec.gc.ca/issues/ias/documents/IASPP_Application_Guidelines_e.pdf (Feb 8, 2007).

Threats to Biodiversity”⁵. This Framework discusses the management of both invasive plant and animal species within BC, and identifies five objectives to be met by the Province and their “partners” as part of this invasive species framework:

1. To reduce the likelihood of alien species invasions by decreasing stresses to vulnerable at-risk ecosystems and species.
2. To prevent both intentional and accidental introductions of harmful invasive alien species to the freshwater, marine or terrestrial realms of British Columbia.
3. To enable early detection of, and rapid response to, invasive alien species occurrences in BC.
4. To undertake effective control and management strategies for invasive alien species occurrences in BC – in a manner that does not put native species and natural ecosystems at risk.
5. To restore native species and habitat conditions in at-risk ecosystems that have been invaded by alien species, and to encourage use of ecological restoration as a means of invasive alien species control and management (p. iv).

This Framework also includes an identification of particularly vulnerable ecosystems, summarizes challenges and causes of invasive species introductions, and outlines a “Species Decision and Management Matrix” that describes the “relationships between objectives, key tools and decisions involved in the management of invasive alien species.” The Chilliwack River Watershed contains one of the vulnerable ecosystems identified in this document: freshwater ecosystems (namely river and lake systems, and wetland habitats). The extinction rate of freshwater species is thought to be five times that of all other groups of species, 70% of which is attributed to invasive alien species.

According to the BC Ministry of Environment, collaborative leadership, organization and action are key to addressing invasive alien species concerns in British Columbia. As a priority, MOE will support coordinated efforts, providing expertise in biodiversity science, policy and standards and other resources as available and feasible.⁶

5.5 Fraser Basin Council's Invasive Plant Strategy

Facilitated by the Fraser Basin Council, a number of Provincial agencies, Regional Districts, First Nations, and non-profit organizations, recently convened in Williams Lake to address the issue of invasive plants in BC. The resulting “Invasive Plant Strategy for British Columbia”⁷ serves as a new strategy for the control or management of invasive plants within BC that uses a collaborative approach incorporating environmental, social, and economic interests.

This Strategy outlines the main impacts associated with invasive plants, and describes the key challenges and subsequent solutions associated with invasive plant management.

⁵ C. Rankin & Associates et al, 2004. Available: http://wlapwww.gov.bc.ca/wld/documents/alien_species_framework_BC_0205.pdf (Feb 7, 2007).

⁶ BC Ministry of Environment Alien Species in BC Website. Available: http://www.env.gov.bc.ca/wld/aliensp/alien_consequence.html (January 31, 2007).

⁷ Wallin et al, 2004. Available: <http://www.invasiveplantcouncilbc.ca/publications/invasive-plant-strategy.pdf> (Feb 7, 2007).

The top ten most significant challenges identified pertaining to the control of invasive plant species in BC included:

1. Improve cooperation among all orders of government, landowners and land users by establishing a body to provide province-wide leadership.
2. Provide the necessary resources for provincial Crown lands to increase the level of invasive plant management undertaken by the provincial government.
3. Enact provincial legislation to manage invasive species not classified as noxious weeds, and federal legislation to prevent the introduction of new invasive species to British Columbia.
4. Improve compliance with current legislation regarding the introduction, spread and control of invasive plants.
5. Increase management of invasive plants on federal land, with the provision of direct funding for First Nations reserve lands.
6. Coordinate a system for the early detection and eradication of new invasive species that arrive in the province, and monitor these populations' impacts and any expansion.
7. Establish a comprehensive provincial inventory of invasive plants in British Columbia.
8. Ensure that all areas of the province implement a regional approach to invasive plant management.
9. Improve the management of invasive aquatic plant species through the necessary technical expertise and funding resources.
10. Identify and promote coordinated research to increase knowledge and awareness about invasive plant biology, ecology and management options and ecosystem restoration (p. 13).

The Invasive Plant Strategy also establishes the formation of the Invasive Plant Council of BC as a non-profit society to coordinate the implement the Strategy, and describes the roles and responsibilities of various interests, including the federal and provincial governments, local government, First Nations, regional weed committees, land owners, industry, non-government organizations, and academia. The Fraser Basin Council is currently preparing a comprehensive action plan for invasive plant management.

The Invasive Plant Council has available a Memorandum of Support letter for agencies or organizations to sign (Figure 2). Signing the Memorandum of Support requires no financial obligation, and is a show of support that the signatory supports the collaborative approach for invasive plant management and the intent of the Invasive Plant Strategy. The Fraser Valley Regional District is a signatory to this Memorandum of Support.



Invasive Plant Strategy for British Columbia Memorandum of Support

The *Invasive Plant Strategy for British Columbia* is a collaborative outcome produced by a wide range of representatives from:

- All orders of government, including federal, provincial, local and First Nations;
- Land- and water-based user groups;
- Resource-based businesses and industries;
- Utilities; and
- Non-government organizations.

The strategy's goal is to build cooperation and coordination to protect British Columbia's environment and minimize negative social and economic impacts caused by the introduction, establishment and spread of invasive alien plants.

Signatories to this Memorandum of Support endorse the strategy's intent and thereby agree to uphold and espouse its goal. Signatories agree to participate in the Invasive Plant Council of British Columbia and help build leadership and a cooperative, province-wide invasive plant management program. Signatories are likewise expected to encourage other potential parties and individuals to work towards successful implementation of the strategy over time.

Nothing in this Memorandum of Support obligates signatories to contribute financially to the Invasive Plant Council of British Columbia or any aspect of the strategy's implementation.


Name _____ Title _____

Organization _____

Signature _____ Date _____


Address _____

Email _____



Send your signed Memorandum of Support to:
Invasive Plant Council of BC
 104-197 2nd Avenue North,
 Williams Lake BC V2G 1Z5

Email: info@invasiveplantcouncilbc.ca
 Tel: (250) 392-1400
 Fax: (250) 305-1004



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Figure 2. Invasive Plant Council's Memorandum of Support to be signed by agencies and organizations that support the Invasive Plant Strategy for BC.

5.6 Greater Vancouver Invasive Plant Council

Motivated by the Provincial Invasive Plant Council, the Greater Vancouver area has recently formed (as of August, 2006) a regional weed committee called the Greater Vancouver Invasive Plant Council to help control the spread of invasive plants in local parks, green spaces, and urban areas within the region.⁸ The GVIPC (www.gvipc.ca) consists of representatives from member municipalities and environmental organizations, from both the GVRD and the Squamish-Sunshine Coast area. Funding for this Council is

⁸ Hanna, D., Personal Communication.

obtained currently by the BC Ministry of Agriculture and Lands, with potential funding also coming from Environment Canada's Invasive Alien Species Partnership Program.

The Greater Vancouver Invasive Plant Council primarily serves a role of facilitation and coordination to provide the support, direction, and information, needed by municipalities and organizations to carry out on-the-ground activities. Part of their functions have included: hosting forums or workshops, operating a listserv, producing informational brochures, coordinating activities between organizations, coordinating pilot projects, and assisting with funding applications by member organizations.

5.7 *BC Ministry of Forests and Range Invasive Species Management Strategy*

The BC Ministry of Forests and Range (MOFR) recognizes that forest practices, particularly road building and maintenance, are a possible cause of the introduction or spread of invasive plant species in BC. It is their responsibility as a Ministry to implement and enforce the Forest and Range Practices Act, which includes control and management provisions pertaining to invasive plant species.

As part of their Invasive Alien Plant Program, the Ministry of Forests and Range maintains a database of known invasive plant species occurrences, and have available to the public a web-based mapping tool⁹ that can be used to show what invasive species have been observed in the region, and where. Figure 3 provides a screen shot from this mapping website. According to the Ministry website, the database is intended to “coordinate/share information generated by various agencies and non-government organizations involved in invasive plant management.”¹⁰ Although access is restricted to “resource managers”, “the application has been developed to allow the entry, edit and query of invasive plant information including: site details; invasive plant inventory information; planning; treatment methods and data; and, monitoring data”.

Under the Forest and Range Practices Act, licensees are obligated to "prevent the introduction or spread of prescribed species of invasive plants." (FRPA s. 47) and to conduct the appropriate evaluation/monitoring as per Ministry standards. These standards and field guides are prepared under MOFR's Forest and Range Evaluation Program.¹¹ Some of the indicators and proposals prepared, or being prepared, under this Program, include evaluations for biodiversity, fish/riparian, and forage and associated plant communities. The Ministry has drafted a set of guidelines they use to review operational plan content provided by licensees regarding their proposed plans for preventing the introduction and spread of invasive plants within their plan boundaries. These guidelines, not yet finalized, include minimizing soil disturbances, re-establishing vegetation on disturbed areas as soon as possible, and minimizing invasive plant seed delivery to work sites and grazed areas.

⁹ Available: http://maps.gov.bc.ca/imf50/imf.jsp?site=mof_iapp (Feb 8, 2007).

¹⁰ Available: http://www.for.gov.bc.ca/hfp/invasive/IAP_01.htm (Feb 8, 2007).

¹¹ Available: <http://www.for.gov.bc.ca/hfp/frep/index.htm> (Feb 8, 2007).

5.8 MAL and MPSSG Invasive Weed Management Program

The Ministry of Agriculture and Lands and the Ministry of Public Safety and Solicitor General (MPSSG) have formed a joint partnership to control invasive plant species. This Invasive Weed Management Program, which was piloted last spring in Nanaimo and is expected to begin operations this spring with a training component, utilizes the inmate labour source to control noxious weeds such as tansy ragwort, Japanese knotweed, and Scotch broom. Once trained in identification, removal techniques, and pesticide applications, inmates will pull, spray, and dispose of noxious weeds from roadside and public areas identified by MAL as target areas. The Ford Mountain Correctional Facility is participating in this process, using inmates to help control noxious weeds within the Chilliwack River Watershed.

5.9 Community Mapping Network's Invasive Species Atlas

The Community Mapping Network (CMN), an interactive mapping tool and website, hosts an Invasive Species Atlas¹², developed by the BC Conservation Foundation. This Atlas shows observed occurrences of invasive species primarily in south western BC and allows users to zoom in to specific areas of the Province to look for known sightings and to record the species and locations of invasive species they have noted (with a Login and Password). Figure 4 provides a screen shot of invasive fish species on the CMN Invasive Species Atlas.

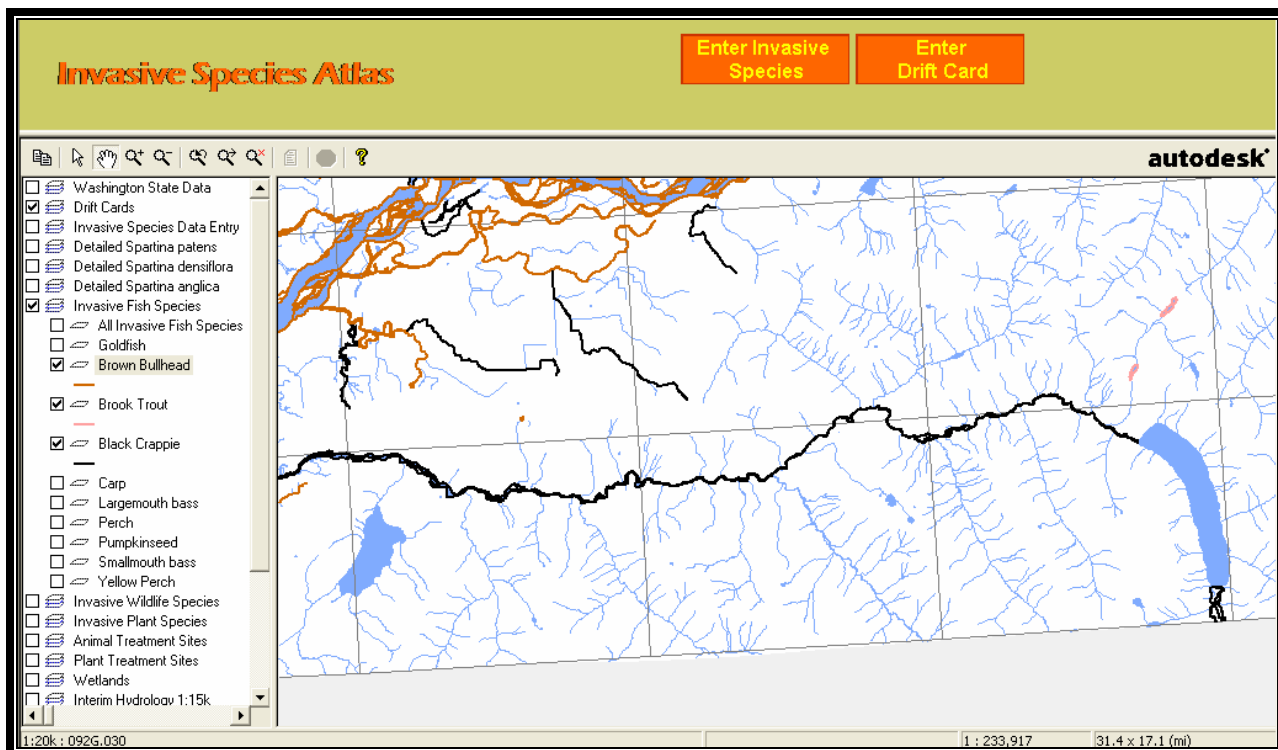


Figure 4 Screen shot of the Community Mapping Network's Invasive Species Atlas.

¹² Available: <http://www.shim.bc.ca/atlas/invasivespecies/main.cfm> (Feb 8, 2007).

5.10 Website Alerts and Information Brochures

Several government agencies and non-government organizations have utilized web-based information campaigns or alerts, or produce information brochures, to notify the public of potential invasive species that are of particular concern and how they can properly identify the species and what they should do if they see it. Examples include:

- Invasive Plant Council of BC’s “Beautiful in your Garden, but be Aware” brochure”, to learn about invasive horticultural plant species (<http://www.invasiveplantcouncilbc.ca/publications/IPC-Hort-Brochure.pdf>),
- BC Ministry of Agriculture and Lands’ Invasive Plant Alert website (<http://www.agf.gov.bc.ca/cropprot/invasiveplant.htm>), which describes approximately 20 invasive plant species people can look for, and includes general tips on what can be done to help prevent further spread of these species;
- BC Ministry of Environment Fish and Wildlife Branch’s “Stop the Alien Aquatic Invaders!” website (http://www.env.gov.bc.ca/fw/fish/ethics/stop_alien_invaders.html), which includes how to identify some potentially damaging aquatic invasive species that might be observed within Provincial freshwater, how to report the observations, and what the public can do to help educate others in their community about these species;
- BC Ministry of Environment’s Exotic Alerts found within the annual Fishing Regulations produced by the Province (<http://www.env.gov.bc.ca/fw/fish/regulations/synopsis.html>);
- DFO’s “Help Protect Our Waters From Exotic Species” website (http://www.pac.dfo-mpo.gc.ca/recfish/Species/exotic_e.htm), which describes a few particularly dangerous aquatic invasives to look out for, as well as how to report observations and how to help prevent the spread of these species.
- Several environmental non-government organizations produce informational brochures or websites that serve to educate the public on how to identify invasive species, and how to prevent their spread (e.g., Langley Environmental Partners Society, <http://www.leps.bc.ca> and Evergreen’s “Stop the Spread” brochure, http://evergreen.ca/en/cg/pdf/invasive/invasive_overview.pdf).

6.0 Relevant Jurisdictions and Legislation

6.1 Federal Legislation

*Fisheries Act (R.S., 1985, c. F-14)*¹³

“No person shall carry on any work or undertaking that results in the harmful alteration, disruption or destruction of fish habitat.” (Section 35)

*Plant Protection Act (1990, c. 22)*¹⁴

2. The purpose of this Act is to protect plant life and the agricultural and forestry sectors of the Canadian economy by preventing the importation, exportation and spread of pests and by controlling or eradicating pests in Canada.

5. Where a person becomes aware of the existence of a thing that the person suspects to be a pest in an area where the pest has not previously been known to exist, the person shall immediately notify the Minister of the suspected pest and provide the Minister with a specimen of it.

6. (1) Except as permitted under this Act or the regulations, no person shall move, grow, raise, culture or produce any thing that there are reasonable grounds to believe is a pest, that is or could be infested with a pest or that constitutes or could constitute a biological obstacle to the control of a pest.

*Species-at-Risk Act (2002, c. 29)*¹⁵

The federal Species-at-Risk Act (SARA) serves to protect endangered species and their identified “critical habitats”, with the intent of allowing for species recovery. Although the Act does not specifically address invasive species, the sections pertaining to the protection of critical habitat (Sections 56-64), would attempt to address any risk to the critical habitat of species-at-risk, including that from invasive species.

6.2 Provincial Legislation

*BC Forest and Range Practices Act*¹⁶, *Invasive Plants Regulation (2004)*¹⁷

Section 47 of FRPA (Invasive plants) A person carrying out a forest practice or a range practice must carry out measures that are: (a) specified in the applicable operational plan, or (b) authorized by the minister, to prevent the introduction or spread of prescribed species of invasive plants.

¹³ Available: <http://lois.justice.gc.ca/en/F-14/index.html> (Dec 29, 2006)

¹⁴ Available: <http://lois.justice.gc.ca/en/P-14.8/254676.html> (Dec 29, 2006)

¹⁵ Available: http://www.sararegistry.gc.ca/the_act/default_e.cfm (Jan 30, 2007)

¹⁶ Available: <http://www.for.gov.bc.ca/tasb/legsregs/frpa/frpa/frpatoc.htm> (Feb 8, 2007).

¹⁷ Available: http://www.qp.gov.bc.ca/statreg/reg/F/ForRangPrac/18_2004.htm (Jan 31, 2007)

Invasive Plants Regulation (2004) – lists a total of 42 invasive weed species recognizes as such under the Act (Appendix B).

Note: this Act is from a forests and forestry perspective, and lists invasive species that are relevant to this perspective.

BC Weed Control Act (1996) and Weed Control Regulation (2001)¹⁸

“The BC Weed Control Act places a duty on all land occupiers to control noxious weeds listed in the Regulations. In BC, there are 47 plant species that are classified as Noxious. These must not be transported to or seeded in areas where they are not already established”.¹⁹ Of these 47 plant species, 21 are listed as invasive across all regions of BC; the others are region-specific. Of the region-specific invasive plants, only wild chervil is listed for the Fraser Valley Regional District (Appendix B).

Note: this Act is from an agricultural perspective, and specifically pertains to control of “noxious weeds” via screenings, transportation of grain, movement of machinery or vehicles, inadequate cleaning of agricultural equipment, seeds and fertilizer usage.

BC Plant Protection Act ([RSBC 1996] c. 365)²⁰

Provides for the protection of native plant species in BC from pests and introduced species by including the authority to establish quarantine areas and inspectors. It is the provincial counterpart to the federal Plant Protection Act.

6.3 Fraser Valley Regional District

Although other bylaws have been enacted by other Regional Districts (e.g., Comox-Strathcona Regional District’s Noxious Weeds Bylaw, 2001 – see Appendix A), no bylaws exist at this point for Electoral Area E with respect to invasive species.

¹⁸ Available: http://www.qp.gov.bc.ca/statreg/stat/W/96487_01.htm (Jan 31, 2007) and http://www.qp.gov.bc.ca/statreg/reg/W/66_85.htm (Jan 31, 2007)

¹⁹ Ministry of Agriculture and Lands, Pest Management Branch Website. Available at: <http://www.agf.gov.bc.ca/cropprot/invasiveplant.htm> (Feb 8, 2007).

²⁰ Available: http://www.qp.gov.bc.ca/statreg/stat/P/96365_01.htm (Jan 29, 2007)

7.0 Vision & Goals

7.1 VISION

The Chilliwack River Watershed retains high biodiversity and ecological values, and both the community and responsible agencies maintain a diligent invasive species strategy involving prevention, early detection, and rapid response.

7.2 GOALS

1. Limit the establishment and spread of invasive species to levels that do not threaten ecological systems or social/cultural values within the watershed,
2. Eliminate unnecessary disturbance that provides an opportunity for invasive species to become established,
3. Increase the awareness amongst all residents and users of the Chilliwack River Watershed about the threat of invasive species, how to identify them, how to avoid the spread or introduction of these species, and how to report or remove them from the watershed,
4. Ensure the coordination of invasive species management between members of the community and all responsible government agencies to prevent the introduction of additional invasive species and to quickly respond to new outbreaks as they emerge.

7.3 MEASURES

1. Number of invasive species within the watershed
2. Severity of outbreaks (amount of area infected)
3. Knowledge of residents/visitors towards invasive species' identification, spread, potential impact, and control measures.

8.0 Possible Options and Solutions

Table 2 describes possible options, and provides a brief evaluation of each option, that may be considered for addressing the issue of invasive species within the Chilliwack River Watershed. Note that challenges are associated with all of the options, which represents a need for prioritizing and selecting individual options that will potentially provide the greatest impacts. Also note that the results of the evaluation were only estimated – studies were not conducted at this point to derive detailed values of time frames, costs, challenges, or feasibilities. Some components of the table could require edits or additions as new information and insights are collected.

Table 2. Description and evaluation of possible options for the control and management of invasive species within the Chilliwack River Watershed. Options in **bold** are recommended as part of the Chilliwack River Watershed Strategy.

Description	Time-frame*	Relative Cost**	Challenges	Feasibility	Potential Champion	Comments
<i>Information Collection</i>						
Reporting and monitoring: establish a reporting hotline or website for community members to report observations	Low/Med	Mod	Staff, logistics	?	?	Data uploading could be part of common database
Common database: Amalgamate FVRD, MOFR, and CMN data onto one common database	Short	Low	coord. of datasets	High	CMN? MOFR?	Both CMN or MOFR are good
Research/Risk Analysis: Develop a better understanding of what species and/or ecosystems we are concerned about (e.g., conduct research into potential of Eurasian watermilfoil to colonize Chilliwack Lake) and prioritize species to target	Medium	Mod	funding	High	MOE? DFO? FVRD?	Required to understand issue and prepare appropriate strategy.
<i>Education</i>						
Community education: Information campaigns (using brochures or websites) to educate public about species to watch for and what to do if observed.	short	low	Small costs	high	FVRD?	Can piggy-back others' brochures and be part of FVRD Noxious Weed Program
Retailer Cooperation: Encourage local greenhouses/landscapers/nursery centers/etc to discourage sale and use of invasive plant species	short	Low	Funding	Low?	?	Other groups are apparently doing this

Description	Time-frame*	Relative Cost**	Challenges	Feasibility	Potential Champion	Comments
Agency Education: Promote or support an information strategy (workshop or training seminar) that will provide invasive species education to agencies or interested parties within the watershed.	Short/ Med	Low/ Mod	Staff and money	High	FVRD?	MOFR expressed interest in participating
Programs						
Community involvement: Organize/support community pulls/removals of invasives (volunteers). Emphasize engaging youth in volunteer efforts. Can be incorporated into existing community clean-up days or on own as a “weed day”.	short	mod	Funding, logistics	Mod	?	Pesticide permits, liability, supervision, and training issues to be resolved.
Expanded Efforts and Diligence: Monitoring and management of invasive species as part of habitat restoration and enhancement projects undertaken	Short	Low	Cost and time	High	DFO?	Parties doing restoration projects can add invasives to their monitoring.
Regulatory						
Bylaws: Local bylaws against certain species (e.g., Comox-Strathcona RD’s Weed Control Regulation Bylaw 2001 – see Appendix A)	Medium	Mod	Landowner consent, enforcement req’d (staff)	Low?	FVRD	May not have sufficient community buy-in at this point.
Invasive Plant Committee: Look into establishing a regional weed council for the Fraser Valley (or just specifically for the Chilliwack River Watershed); or, into possibilities for working with the Greater Vancouver Invasive Plant Council	Short/ Medium	Low (to join)	Time and \$ for forming new committee	?	?	Potential funding if form own IPC, but issue may not warrant this level of action yet.

***Time Frame**

Short =Within 1 year; Medium = 1-5 years; Long = More than 5 years

****Relative Cost**

Low = staff or student time only and/or could be completed within existing budgets

Moderate = staff time plus small amount (e.g. up to \$5,000) of external funding required

High = large amount of external or new funding required

9.0 Analysis

Upon review of existing information about invasive species in the Chilliwack River Watershed, it seems that the risk and impact of invasive species on ecological communities and social/cultural values is low at this time. In BC, invasive species are more of a concern in at-risk ecological communities such as wetlands and Garry Oak ecosystems. There are few known species or ecological communities in the Chilliwack River Watershed that are currently known to be at high risk from invasive species. Therefore, a significant effort/expense to address this issue will be difficult to justify at this time. However, given the potential threat of invasives in general, proactive steps should be taken to ensure that the risk posed by invasive species remains low.

In contrast to more urbanized regions in the GVRD, the rural nature of the Chilliwack River Watershed means that it faces slightly different threats from invasive species. The level of development in the valley is currently quite low and is expected to remain fairly low in the future. Therefore, species typically associated with urban type disturbances are probably less of a concern in the watershed. Species that affect large expanses of forested areas or aquatic environments likely pose a greater risk to the watershed. For example, it has been shown both in field research and hydrological modeling that watersheds with tree mortalities of 30-50% due to beetle infestations result in high water yields within the watershed of 12-19% for over 25 years following infestation.²¹ In addition to higher water yields, other hydrological impacts associated with beetle infestations have included earlier timing of peak flows, reduced erosion and sedimentation rates, increased erosion of stream bed and banks, loss of fish habitat, increased landslide activity, channel destabilization, loss of soil and soil nutrients, and decreased water quality.²² Current stand diversity within the Chilliwack River Watershed should help reduce the likelihood of such devastating beetle infestations from occurring within the area, but climatic conditions or the introductions of new forest pests could change this level of risk in the future.

While the threat posed by aquatic invasive species seems quite low upstream of Vedder Crossing at this time, the potential for this threat to expand, especially with climate change, should not be underestimated. The impacts of invasive plants and animals in the lower parts of the watershed (e.g. Cultus Lake, Vedder River/Canal) to fish and other wildlife are believed to be quite high. For example, significant effort has been expended on removing milfoil from Cultus Lake because it is believed to support populations of Northern pikeminnow, which prey upon the endangered Cultus sockeye salmon. In addition, non-native amphibians and fish such as bullfrogs, green frogs and bass, can out-compete native amphibians and fish (C. Rankin & Associates et al, 2004). While these invasive plants and animals may require conditions that are not prevalent upstream of Vedder Crossing at this time (e.g. water temperature, certain types of disturbance, transportation vectors), climate change and other human activities may create the appropriate conditions in the future.

In general, control or management of invasive species requires a two-pronged approach. First, attempts to prevent the introduction of the species must be taken. Second, if the species does become introduced, attempts to prevent it from becoming established and from spreading are required. The first of these approaches, prevention, can take the form of education (what species

²¹ Uunila et al, 2006. Available: http://www.forrex.org/streamline/ISS31/streamline_vol9_no2.pdf (Feb 7, 2007).

²² Helie et al, 2005, and Winker et al, n.d

to avoid planting or releasing, potential impacts of doing so), policies (to prevent the intentional introduction of potentially damaging species), or legislation (restricting imports, mandatory quarantines or inspections, etc). The second level of control, preventing the establishment and spread of the species, requires both early detection and a rapid and effective response. These strategies can include education (how to identify invasive species, how to remove them), monitoring and reporting mechanisms, and aggressive treatment and follow-up (direct physical removals, chemical control, biological control, subsequent replanting with aggressive local species). Given the required rapid response that is needed and the potential spread of these species, communication and coordination between responsible agencies and the communities are vital components of any invasive species management strategy.

In order to ensure that the threats posted by invasive species in the watershed remain low in the Chilliwack River Watershed over time, a variety of actions could be taken (Table 2). Not all of these actions may be warranted at this time. A logical first step would be to encourage/support early detection, monitoring and management efforts already underway by the FVRD, MOF, CMN and others. Existing communication and outreach activities in Greater Vancouver and other parts of the province could also be expanded within the FVRD. In addition, a more comprehensive analysis could be undertaken to identify which species pose a potential significant threat (i.e. if they were to become established and/or widespread), which ecosystems/species are most at risk (e.g. rare species or ecosystems), and which habitats or areas chemical treatment (i.e., pesticides) should be avoided or minimized. Such an analysis would enable education, policy development, monitoring activities, and management efforts to be targeted more specifically, effectively, and safely.

10.0 Recommendations

Based on both perceived importance and feasibility, the following actions have been recommended by the Project Team as part of the Chilliwack River Watershed Strategy for addressing the issue of invasive species:

1. **Research/Risk Analysis:** Undertake a risk analysis to identify which invasive species pose a significant, or potential significant, threat to the Chilliwack River Watershed (i.e. if they were to become established and/or widespread) and which ecosystems/species are most at risk within the watershed (e.g. rare species or ecosystems). The results can then be ranked in order to prioritize further action requirements. This risk analysis could include assessments of invasive species and issues in neighbouring jurisdictions (e.g., eastern GVRD, North Cascades National Forest, etc.) and neighbouring watersheds (e.g., Harrison, Stave, etc.) to predict potential future outbreaks within the Chilliwack River Watershed, and assessments of sensitive habitats or locations in which chemical treatments should be avoided or minimized.
2. **Common database:** Investigate ways in which existing databases could be linked or streamlined to create a single, comprehensive database of invasive species in the Chilliwack River Watershed that is regularly updated and accessible.

3. **Community education:** Distribute available brochures (e.g., from Greater Vancouver Invasive Plant Council, etc.), using FVRD Noxious Weed program or other points of contact with the community. Additionally, the CRWS Website (or alternative) can alert people to the issue as well as provide user-friendly information. The website can include links to pdf brochures, a weed of the month, attractive photos, and dramatic signage.
4. **Agency Education:** Promote or support an information strategy (workshop or training seminar) that will provide invasive species education to interested parties. This would include species identification as well as most effective and safe control techniques.
5. **Expanded Efforts and Diligence:** As part of habitat restoration and enhancement projects undertaken with the Chilliwack River Watershed, include monitoring and management of invasive species on the site as part of the overall monitoring program for the project.
6. **Community involvement:** Invasive species removal requires ongoing diligence and observations. As a result, support and participation from the community is an essential component to long-term success of invasive species management. Volunteer opportunities that engage and educate the local communities, including local youths, can be organized or supported. These events can either be on their own (e.g., “weed day”), or be incorporated into existing community clean-up days. Investigating the establishment of such events, including logistical issues pertaining to pesticide permits, liabilities, supervision, training, and organizing/funding, are recommended.
7. **Invasive Plant Committee:** Investigate the formation of a multi-stakeholder, inter-agency Invasive Species Committee for the Chilliwack River Watershed that can coordinate activities and pursue collaborative efforts to manage invasive species within the watershed.

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Appendix A: Key Components of Relevant Legislation

Federal Legislation

Fisheries Act (R.S., 1985, c. F-14)¹

Section 35. (1) No person shall carry on any work or undertaking that results in the harmful alteration, disruption or destruction of fish habitat.

Fish Health Protection Regulations: Section 3. (1) Subject to subsection (2), no person shall import cultured fish or eggs of wild fish without an import permit.

Plant Protection Act (1990, c. 22)²

Preamble: An Act to prevent the importation, exportation and spread of pests injurious to plants and to provide for their control and eradication and for the certification of plants and other things

Section 2: The purpose of this Act is to protect plant life and the agricultural and forestry sectors of the Canadian economy by preventing the importation, exportation and spread of pests and by controlling or eradicating pests in Canada.

Section 6: (1) Except as permitted under this Act or the regulations, no person shall move, grow, raise, culture or produce any thing that there are reasonable grounds to believe is a pest, that is or could be infested with a pest or that constitutes or could constitute a biological obstacle to the control of a pest.

(2) Where an inspector believes on reasonable grounds that a thing is a pest, is or could be infested with a pest or constitutes or could constitute a biological obstacle to the control of a pest, the inspector may prohibit the owner of the thing or the person having the possession, care or control of it from moving it without the written authorization of an inspector.

Section 7: 7. (1) No person shall import or admit into Canada or export from Canada any thing that is a pest, that is or could be infested with a pest or that constitutes or could constitute a biological obstacle to the control of a pest, unless

- a) the thing is or has been presented to an inspector in accordance with subsection (2) at a place designated by the regulations or by an inspector;
- b) the person has produced to an inspector all permits, certificates and other documentation required by the regulations; and
- c) the thing is imported or exported in accordance with any other requirements of the regulations.

¹ Available: <http://lois.justice.gc.ca/en/F-14/index.html> (Dec 29, 2006)

² Available: <http://lois.justice.gc.ca/en/P-14.8/254676.html> (Dec 29, 2006)

Species-at-Risk Act (2002, c. 29)³

58. (1) Subject to this section, no person shall destroy any part of the critical habitat of any listed endangered species or of any listed threatened species - or of any listed extirpated species if a recovery strategy has recommended the reintroduction of the species into the wild in Canada - if

- (a) the critical habitat is on federal land, in the exclusive economic zone of Canada or on the continental shelf of Canada;
- (b) the listed species is an aquatic species; or
- (c) the listed species is a species of migratory birds protected by the Migratory Birds Convention Act, 1994.

59. (1) The Governor in Council may, on the recommendation of the competent minister after consultation with every other competent minister, make regulations to protect critical habitat on federal lands.

(2) The competent minister must make the recommendation if the recovery strategy or an action plan identifies a portion of the critical habitat as being unprotected and the competent minister is of the opinion that the portion requires protection.

(3) The regulations may include provisions requiring the doing of things that protect the critical habitat and provisions prohibiting activities that may adversely affect the critical habitat.

60. (1) If a wildlife species has been classified as an endangered species or a threatened species by a provincial or territorial minister, no person shall destroy any part of the habitat of that species that the provincial or territorial minister has identified as essential to the survival or recovery of the species and that is on federal lands in the province or territory.

61. (1) No person shall destroy any part of the critical habitat of a listed endangered species or a listed threatened species that is in a province or territory and that is not part of federal lands.

(1.1) Subsection (1) does not apply in respect of

- (a) an aquatic species; or
- (b) the critical habitat of a species of bird that is a migratory bird protected by the Migratory Birds Convention Act, 1994 that is habitat referred to in subsection 58(5.1).

³ Available: http://www.sararegistry.gc.ca/the_act/default_e.cfm (Feb 9, 2007)

Provincial Legislation

BC Weed Control Act (1996)⁴

2 In accordance with the regulations, an occupier must control noxious weeds growing or located on land and premises, and on any other property located on land and premises, occupied by that person.

3 (1) the minister may appoint inspectors for this Act under the Public Service Act.

(2) At any time during daylight hours, an inspector may enter any land, premises, except a residence, and property for any purpose relating to the administration or enforcement of this Act or the regulations, and may inspect and examine the land, premises and property.

(3) An inspector who enters land, premises or property under subsection (2) may require an occupier of the land, premises or property

- (a) to give the inspector all reasonable assistance in connection with the entry, inspection and examination,
- (b) to answer all proper questions relating to the inspection and examination, and
- (c) for the purposes of paragraphs (a) and (b), to attend at the land, premises or property with the inspector.

Notice to control noxious weeds

4 (1) An inspector may serve a notice directing an occupier, in accordance with the notice, to control noxious weeds growing or located on land, premises or property occupied by the occupier.

(2) If a notice is served on an occupier the occupier must promptly bring the notice to the attention of the owner of the land, premises or property that is the subject of the notice.

Control of noxious weeds by inspector

7 (1) If (a) a notice is served under section 6 and, in the opinion of an inspector, noxious weeds are not controlled (i) within the time, which must not be less than 5 days, specified in the notice, or (ii) in the manner specified in the notice, or (b) an inspector is of the opinion that, in order to prevent the injurious distribution and effect of noxious weeds, it is necessary to immediately control the noxious weeds, an inspector may, without notice, take the action considered necessary to enter on any land, premises or property and control noxious weeds.

Recovery of costs

8 (1) If the amount specified in a certificate issued under section 7 is not paid, the municipal officer or minister who issued the certificate may, (a) if the noxious weeds were controlled on land or an improvement in a municipality, other than a regional district, send a certificate containing

- i. a legal description of the land,

⁴ Available: http://www.qp.gov.bc.ca/statreg/stat/W/96487_01.htm (Jan 31, 2007)

- ii. a description of the improvement and legal description of the land on which it is located,
 - iii. the name of the owner of the land or improvement, and
 - iv. the total amount of the money owing,
- to the duly appointed collector of taxes for that municipality, or

(2) On receipt of a certificate referred to in subsection (1), the municipal collector or the Surveyor of Taxes must enter in the tax roll the amount set out in the certificate in respect of the land or improvement referred to in it, and the amount is then deemed for all purposes to be, as applicable, (a) taxes in arrear of the municipality under the Community Charter, or (b) delinquent taxes under the Taxation (Rural Area) Act, and the provisions for collection and recovery of taxes contained in those Acts apply to those amounts.

Weed Control Committees

9 (1) The council of a municipality may establish one or more weed control committees, each consisting of

- (a) one member of the council appointed by the council,
 - (b) one resident in the municipality appointed by the council,
 - (c) one member of the ministry appointed by the minister,
 - (d) one member in good standing, appointed by the council, of a society that is incorporated under the Society Act and that has as a primary purpose the protection of the environment or the encouragement of anti-pollution measures, and
 - (e) one member appointed by the Minister of Health.
- (2) A member of a weed control committee holds office for a period of one year.
- (3) If a council establishes a weed control committee under subsection (1), that council
- (a) must notify the minister in writing of the names of the persons appointed,
 - (b) must provide secretarial or clerical assistance for the weed control committee,
 - (c) must designate the member of the weed control committee appointed by council to be chair, and
 - (d) may provide for the payment of expenses to weed control committee members.
- (4) A weed control committee must, with respect to its municipality,
- (a) advise the minister and the council on all matters relating to noxious weeds and noxious weed control,
 - (b) compile a list of weeds that it considers to be noxious and to require control, and submit the list to the minister and the council,
 - (c) advise the council on the appointment of weed control officers, and supervise weed control officers,
 - (d) assist in the organization and administration of weed control programs,
 - (e) not later than Oct. 1 in each year, submit to the minister and the council an annual report, and estimates for the next year, respecting weed control matters, and
 - (f) perform other duties the Lieutenant Governor in Council prescribes.

BC Plant Protection Act ([RSBC 1996] c. 365)⁵

Section 8 (1) In order to prevent the spread in British Columbia of an insect, pest or disease destructive to plants, the Lieutenant Governor in Council may make regulations referred to in section 41 of the Interpretation Act.

(2) Without limiting subsection (1), the Lieutenant Governor in Council may make regulations as follows:

- a) prescribing the type or manner of treatment and who must carry it out;
- b) providing for collection, from the owner, of the expenses of treatment, and prescribing a method or system for that collection;
- c) prohibiting the sale or providing for the confiscation or destruction of a plant, root medium or container that is infested or infected or suspected of being infested or infected with an insect, pest or disease destructive to plants, or that is damaged by frost or otherwise injured;
- d) providing for reporting the discovery of a destructive insect, pest or disease and for obtaining and sending specimens;
- e) setting fees payable to the government for inspection or other service under the regulations;
- f) establishing quarantine areas in British Columbia and regulating or prohibiting the moving of a plant, root medium or container from or into a quarantine area.

⁵ Available: http://www.qp.gov.bc.ca/statreg/stat/P/96365_01.htm (Dec 29, 2006)

Local Government

Example of Invasive Species Bylaw: Comox-Strathcona Regional District Bylaw No. 2347 (2001)⁶

REGIONAL DISTRICT OF COMOX-STRATHCONA

BYLAW NO. 2347

A BYLAW TO REGULATE NOXIOUS WEEDS

WHEREAS the Board of the Regional District of Comox-Strathcona adopted Bylaw No. 2346 being “Regional District Weed Control Service Establishment Bylaw 2001” on the 26th day of March, 2001;

AND WHEREAS under Section 797.1(1)(d) of the Local Government Act, a Regional District may exercise the regulatory powers of a municipality under Section 725(1)(e) of the Local Government Act to require the owners or occupiers of real property, or their agents, to clear the property of brush, trees, noxious weeds or other growths;

AND WHEREAS the Regional District deems the plants listed in Schedule ‘A’ to this Bylaw to be noxious weeds;

AND WHEREAS the Regional District wishes to enact a Bylaw to eradicate the noxious weeds listed in Schedule ‘A’ within Electoral Areas ‘A’, ‘B’, ‘C’ and ‘K’ of the Regional District of Comox-Strathcona;

NOW THEREFORE, the Board of the Regional District of Comox-Strathcona, in open meeting assembled, enacts as follows:

1. CITATION

This Bylaw may be cited for all purposes as the “REGIONAL DISTRICT WEED CONTROL REGULATION BYLAW 2001”

2. DEFINITIONS

In this Bylaw:

- | | |
|---------------------------|---|
| a) Administration Officer | means a person appointed under that title by the Board pursuant to its powers under the Local Government Act. |
| b) Board | means the Board of the Regional District of Comox-Strathcona |
| c) Bylaw Enforcement | means a person appointed by or contracted by the Board Officer to enforce this Bylaw. |
| d) Occupier | has the same meaning as in the Local Government Act. |
| e) Owner | has the same meaning as in the Local Government Act. |
| f) Real property | has the same meaning as in the Local Government Act. |
| g) Regional District | means the Regional District of Comox-Strathcona |

3. PROHIBITION

Every owner or occupier of real property in Electoral Areas ‘A’, ‘B’, ‘C’ and ‘K’ of the Regional District of Comox-Strathcona, or that person’s agent, shall ensure that his or

⁶ Available: http://www.rdc.bc.ca/uploadedFiles/Administration/Noxious_Weed_Bylaw.pdf (Jan 23, 2007)

her property be cleared of, and remain free from, all noxious weeds listed in Schedule 'A' to this Bylaw.

4. AUTHORIZED INSPECTION OFFICER

A Bylaw Enforcement Officer or the Administration Officer is authorized to enter upon any real property within the Regional District at all reasonable times, after having given notice to the owner or occupier, for the purpose of inspecting the same property in order to ascertain whether noxious weeds listed in Schedule 'A' to this Bylaw are present.

5. NOTIFICATION TO OWNERS AND OCCUPIERS

- 1) If the Administration Officer determines that there are noxious weeds present on any property within the Regional District, he or she shall notify the owner or occupier of such real property, by letter, to take steps to eradicate the weeds within fourteen (14) days of the date of the inspection.
- 2) If, after the expiry of 14 days from the date inspection, the noxious weeds have not been eradicated to the satisfaction of the Administration Officer and no appeal from the Administration Officer's order has been filed, it shall be lawful for the Regional District, by its employees, agents or contractors, to enter upon such real property to eradicate the noxious weeds by any means necessary, at the expense of the person defaulting.

6. COSTS OF ERADICATION

The charges incurred by the Regional District for eradicating the weeds, if unpaid on the 31st day of December in any year, shall be added to and form part of the taxes applicable in respect of such real property as taxes in arrears.

7. NOTICE

Where notice is to be given pursuant to this bylaw, such notice shall be given in writing. Notice shall be deemed sufficiently delivered if:

- a) personally service upon the owner or occupier of the property affected by such notice; or
- b) mailed by registered mail to the address of the real property or the last known address of the owner or occupier, and subsequently signed for by or on behalf of the owner or occupier.

8. PENALTY

Every person who contravenes a provision of this Bylaw commits an offence and is liable on summary conviction to the penalties prescribed by the Offence Act.

9. SEVERABILITY

If any provision of this Bylaw is found invalid by any court of competent jurisdiction, the offending portion shall be severed. Such decision shall not affect the validity of the remaining portions of this bylaw.

10. HEADINGS

The headings in this Bylaw are inserted for convenience and reference only and in no way define, limit or enlarge the scope of this bylaw or any portion thereof.

11. COMING INTO FORCE

This bylaw shall come into force and take effect on or after the date of its adoption.

READ A FIRST AND SECOND TIME THIS 26TH DAY OF MARCH 2001.

READ A THIRD TIME THIS 26TH DAY OF MARCH 2001.

ADOPTED THIS 26TH DAY OF MARCH 2001.

"D.M. Andrews" (Chair) "B. Randall" (Manager of Corporate Administration)

I hereby certify the foregoing to be a true and correct copy of Bylaw 2347 being "Regional District Weed Control Regulation Bylaw 2001" as adopted by the Board of the Regional District of Comox-Strathocna on the 26th day of March, 2001.

"B. Randall"

Manager of Corporate Administration

SCHEDULE 'A'
REGIONAL DISTRICT OF COMOX-STRATHCONA

BYLAW NO. 2774 (AMENDMENT)

"REGIONAL DISTRICT WEED CONTROL REGULATION BYLAW 2001, AMENDMENT BYLAW NO. 3"

SCHEDULE 'A'

Purple Loosestrife	(Lythrum Salicaria)
Japanese Knotweed	(Polygonum cuspidatum)
Yellow Flag Iris	(Iris pseudacorus)
Spotted Knapweed	(Centaurea biersteinii)
English Ivy	(Hedera helix)
Giant Cow Parsnip (Hogweed)	(Heracleum mantegazzianum)
Scotch Broom	(Cytisus scoparius)
Gorse	(Ulex europaeus)
Dalmatian Toadflax	(Linaria dalmatica)
Himalayan Blackberry	(Rubus discolor)

Appendix B: Legally Listed Invasive Species in BC

*Invasive Plants Regulation (2004), of the BC Forest and Range Practices Act*²⁹

Section 2 For the purposes of section 47 of the Forest and Range Practices Act, the prescribed species of invasive plants are as follows:

Weed Species	Scientific name
Anchusa	<i>Anchusa officinalis</i>
Baby's breath	<i>Gypsophila paniculata</i>
Black knapweed	<i>Centaurea nigra</i>
Blueweed	<i>Echium vulgare</i>
Brown knapweed	<i>Centaurea jacea</i>
Bull thistle	<i>Cirsium vulgare</i>
Canada thistle	<i>Cirsium arvense</i>
Common burdock	<i>Arctium minus</i>
Common tansy	<i>Tanacetum vulgare</i>
Dalmatian toadflax	<i>Linaria dalmatica</i>
Diffuse knapweed	<i>Centaurea diffusa</i>
Field scabious	<i>Knautia arvensis</i>
Giant knotweed	<i>Polygonum sachalinense</i>
Gorse	<i>Ulex europaeus</i>
Hoary alyssum	<i>Berteroa incana</i>
Hoary cress	<i>Cardaria draba</i>
Hound's-tongue	<i>Cynoglossum officinale</i>
Japanese knotweed	<i>Polygonum cuspidatum</i>
Leafy spurge	<i>Euphorbia esula</i>
Marsh thistle	<i>Cirsium palustre</i>
Meadow hawkweed	<i>Hieracium pilosella.</i>
Meadow knapweed	<i>Centaurea pratensis</i>
Nodding thistle	<i>Carduus nutans</i>
Orange hawkweed	<i>Hieracium aurantiacum</i>
Oxeye daisy	<i>Chrysanthemum leucanthemem</i>

²⁹ Available: http://www.qp.gov.bc.ca/statreg/reg/F/ForRangPrac/18_2004.htm (Jan 31, 2007)

Perennial pepperweed	<i>Lepidium latifolium</i>
Plumeless thistle	<i>Carduus acanthoides</i>
Puncture vine	<i>Tribulus terrestris</i>
Purple loosestrife	<i>Lythrum salicaria</i>
Rush skeletonweed	<i>Chondrilla juncea</i>
Russian knapweed	<i>Acroptilon repens</i>
Scentless chamomile	<i>Matricaria maritima</i>
Scotch broom	<i>Cytisus scoparius</i>
Scotch thistle	<i>Onopordum acanthium</i>
Spotted knapweed	<i>Centaurea maculosa</i>
St. John's wort	<i>Hypericum perforatum</i>
Sulphur cinquefoil	<i>Potentilla recta</i>
Tansy ragwort	<i>Senecio jacobaea</i>
Teasel	<i>Dipsacus fullonum</i>
Yellow Iris	<i>Iris pseudacorus</i>
Yellow starthistle	<i>Centaurea solstitialis</i>
Yellow toadflax	<i>Linaria vulgaris</i>

Weed Control Regulation (2001) (of the 1996 BC Weed Control Act) ³⁰

A total of 21 plant species are listed as “Provincial Weeds”, with 27 others listed as “Regional Weeds”. Of these regional weeds, only wild chervil is listed for the Fraser Valley Regional District.

Schedule A

[en. B.C. Reg. 156/93, s. 2; am. B.C. Regs. 209/96, s. 1; 51/99.; 189/2001]

Part I — Provincial Weeds

Weeds classed as noxious within all regions of the province:

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

Part II — Regional Weeds

³⁰ Available: http://www.qp.gov.bc.ca/statreg/reg/W/66_85.htm (Jan 31, 2007)

The following additional weeds listed are designated as noxious weeds within the boundaries of the corresponding regional districts:

Blueweed (<i>Echium vulgare</i>)	Cariboo, Central Kootenay, Columbia-Shuswap, East Kootenay, Okanagan-Similkameen, Thompson-Nicola
Burdock (<i>Arctium</i> spp.)	Bulkley-Nechako, Cariboo, Columbia-Shuswap, Fraser-Fort George, Kitimat-Stikine, North Okanagan, Okanagan-Similkameen, Peace River, Thompson-Nicola
Cleavers (<i>Galium aparine</i>)	Peace River
Common Bugloss (<i>Anchusa officinalis</i>)	Kootenay-Boundary
Common Tansy (<i>Tanacetum vulgare</i>)	Bulkley-Nechako, Central Kootenay, Columbia-Shuswap, East Kootenay, North Okanagan
Field Scabious (<i>Knautia arvensis</i>)	Bulkley-Nechako, Kootenay-Boundary, Thompson-Nicola
Green Foxtail (<i>Setaria viridis</i>)	Peace River
Hoary Alyssum (<i>Berteroa incana</i>)	Kootenay-Boundary
Hoary Cress (<i>Cardaria</i> spp.)	Columbia-Shuswap, North Okanagan, Thompson-Nicola
Kochia (<i>Kochia scoparia</i>)	Peace River
Marsh Plume Thistle (<i>Cirsium palustre</i>)	Bulkley-Nechako, Fraser-Fort George
Meadow Knapweed (<i>Centaurea pratensis</i>)	Columbia-Shuswap
Night-flowering catchfly (<i>Silene noctiflora</i>)	Peace River
Orange Hawkweed (<i>Hieracium aurantiacum</i>)	Bulkley-Nechako, Cariboo, Central Kootenay, Columbia-Shuswap, East Kootenay, Thompson-Nicola
Oxeye Daisy (<i>Chrysanthemum leucanthemum</i>)	Cariboo, North Okanagan, Peace River, Thompson-Nicola
Perennial Pepperweed (<i>Lepidium latifolium</i>)	East Kootenay, Thompson-Nicola
Plumeless Thistle (<i>Carduus acanthoides</i>)	Central Kootenay
Puncturevine (<i>Tribulus terrestris</i>)	Okanagan-Similkameen
Quackgrass (<i>Agropyron repens</i>)	Peace River
Russian Knapweed (<i>Acroptilon repens</i>)	North Okanagan
Russian Thistle (<i>Salsola kali</i>)	Peace River

Scotch Thistle (<i>Onopordum acanthium</i>)	North Okanagan
Sulphur Cinquefoil (<i>Potentilla recta</i>)	Colombia-Shuswap, North Okanagan, Okanagan-Similkameen, Thompson-Nicola
Tartary Buckwheat (<i>Fagopyrum tataricum</i>)	Peace River
White Cockle (<i>Lychnis alba</i>)	Peace River
Wild Chervil (<i>Anthriscus sylvestris</i>)	Fraser Valley
Wild Mustard (<i>Sinapsis arvensis</i>)	Peace River