

Operational Plan for Invasive Species Management in the Boundary

2021 to 2026



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1.0 Introduction

Invasive species present a growing economic, environmental, and social threat to the resources of not only the Boundary area, but of the entire Province. They are one of the most serious threats to ecosystem health facing us today. Invasive species are non-native plants and animals that have been introduced to British Columbia without the natural controls that kept them in check in their native habitats. For this reason, and because of their aggressive growth, these introduced species can be highly destructive, very competitive, and difficult to control. The *Invasive Species Strategy for BC*¹ was first developed for 2014-2018 and was updated again in 2021 and 2025. It provides a framework on how to effectively manage the growing problem of invasive species. The *Strategic Plan for Invasive Species Management in the Boundary*² (Strategic Plan) was updated for 2021-2026 and provides Boundary specific guidance focusing on prevention, education, and management of invasive species. The following *Operational Plan for Invasive Species Management in the Boundary* is designed to work in cooperation with the Strategic Plan to help guide operational surveys, treatments, and monitoring of invasive species in the Boundary region.

1.1 Impacts of Invasive Species

Invasive species can have a large economic, environmental, and social impacts. Invasive plants and noxious weeds negatively affect agricultural production, reduce crop yield and quality, reduce forage for livestock, can lead to increased erosion and sedimentation, and can harbour pests and diseases of agricultural crops. Invasive plants can reduce forage for wildlife and alter habitat for grassland dependant species. Invasive plants can impact human health since some cause allergies, reduce sightlines along highways, and even can cause skin burns. Knotweed infestations along creek systems not only block access for recreation and wildlife but also increase bank erosion. Introduced tree species moving into shrub dominated riparian areas can completely change the structure of the habitat. The full extent of impacts on species at risk are not known but information available suggests that these are far reaching impacts³. Dense patches of invasive aquatic plants like Eurasian watermilfoil are a safety hazard in addition to altering aquatic habitats in favour of introduced fish species. The potential introduction of zebra and quagga mussels would disrupt aquatic food chains, litter beaches with sharp shells, clog water intakes, and impact water-based recreation. Preventing new invasive species from being introduced into the Boundary is very important to the future health of our economic, environmental, and social resources. Invasive species affect us all, so we all need to work together limit their impact to the Boundary.

1.2 History of Invasive Species Management in the Boundary

Land development and the associated land disturbances continue to occur rapidly throughout the Boundary area resulting in increased soil disturbance, which, in combination with the mild climate and low rainfall, provides habitat conducive to the establishment and spread of many invasive plants.

Diffuse knapweed had been the species of primary concern in the Boundary for many years as it has significantly reduced forage production throughout the low elevation grasslands. However, large infestations of sulphur cinquefoil, hoary alyssum, and spotted knapweed have recently dwarfed the impacts of diffuse knapweed on many range areas. Isolated infestations of common bugloss, blueweed, plumeless thistle, field scabious, orange hawkweed, leafy spurge and other invasive plants occur within the area and have the potential to become serious problems if not controlled. Concern has been raised about potential introductions of invasive aquatic plants and animals and the

¹ *Invasive Species Strategy for BC* available at: [Invasive-Species-Strategy-for-British-Columbia-2024-2028-WEB.pdf](#)

² *Strategic Plan for Invasive Species Management in the Boundary* available at: [Strategic Plan for Boundary 2021-2026 PDF](#)

³ Voller, J. and R.S. McNay. 2007. Problem Analysis: Effects of Invasive Species on Species at Risk in British Columbia. FORREX Series 20. (46) https://www.academia.edu/113158249/Problem_Analysis_Effects_of_Invasive_Species_on_Species_at_Risk_in_British_Columbia

devastating impacts that could result from their spread, although little focus has been given to aquatic invasive species until recent years. It is imperative that invasive species are effectively managed by all land managers/owners to protect the remaining landscape from further degradation.

1.3 Key Organisations and Land Managers

A collaborative coordinated approach has proven to be very effective for management as invasive species do not respect arbitrary jurisdictional boundaries. The Boundary Invasive Species Society (BISS), a non-profit and registered charity, was founded in 1999 to undertake an education program and has taken on a key role in coordination of management activities and strategic planning for land managers in the Boundary. Key partners in the area include the Regional District of Kootenay Boundary (RDKB) who operate a weed management function under a bylaw that currently delivers all on ground herbicide treatments for partnering land managers. Land managers include provincial agencies, First Nations, municipalities, utility companies, forestry companies, agriculturalists, conservation and stewardship groups, private landowners, and industry including mining companies. A list of land jurisdiction types and applicable legislation is included in Appendix 3.

Each landowner or land manager has a legal obligation to manage invasive plants which could include prevention, containment and/or control depending on their mandate and legal obligations. This plan provides a framework for all land managers to develop priorities for invasive species management consistent with their specific land management objectives.

2.0 Boundary Region

2.1 Plan Area and Land Use Jurisdictions

The Boundary covers about 718,000 ha and is entirely within the Kettle River drainage. It is within the Regional District of Kootenay Boundary and includes all the area within Electoral Areas C, D, and E. It extends west of Anarchist Summit, east to the Paulson Summit, north to Big White, and south to the USA border. The area has a diverse economy including forestry, with one active sawmill that is the main economic driver in the area, and agriculture, tourism, and mining providing supplementary benefits. The agriculture industry consists mainly of hay, beef cattle, commercial nurseries, grains, vegetables, tree fruit, and dairy. Farms are spread through the main valleys of the Kettle and Granby rivers and in the Bridesville and Sidley areas. Adjacent crown land is used for livestock grazing. Tourism is prevalent throughout the area. Utility corridors traverse the southern part of the region including hydro and gas rights-of-way, and a short railroad. The main highways, secondary roads, forest service access roads, and recreation and rail trails, form a huge network of travel corridors that act as primary dispersal routes for invasive plant seeds.

Three municipalities (Greenwood, Midway and Grand Forks) and five un-incorporated communities (Christina Lake, Rock Creek, Beaverdell, Big White, Westbridge, and Bridesville) are present in the region. A variety of land holdings including private land, local government land, small parks, trails, industrial areas and undeveloped land comprise the bulk of the lower elevation areas. These areas have relatively high concentrations of invasive plants that are easily spread to adjacent areas through a variety of methods including wind, vehicles, animals, and other vectors. The Grand Forks and Midway airports are the only lands under federal jurisdiction although there may be other airports under federal jurisdiction as well. Traditional territories of eight First Nations bands cover all the Boundary and overlap in many areas.

There are eleven provincial parks, recreation areas and ecological reserves covering approximately 11% of the land base. An estimated 85% of the Boundary is provincial public land under the jurisdiction of various agencies including the Ministry of Forests, Ministry of Water, Land and Resource Stewardship, BC Parks, Recreation Sites and Trails, , Ministry of Transportation and

Infrastructure, and Ministry of Energy, Mines and Petroleum Resources. This provincial public land is used by forestry, range and mining interests under tenures, licenses and permits in addition to recreational users.

2.2 Invasive Plant Management Areas

Three Invasive Plant Management Areas (IPMA) have been set up for the Boundary which roughly follow the RDKB Electoral Area Boundaries. West Boundary includes the area bounded by Electoral Area E with the addition of Hwy 3 west to Nine Mile Pit. East Boundary includes the area bounded by Electoral Area D. Christina Lake Area includes Area C and portion of Area B up to the Paulson Summit.

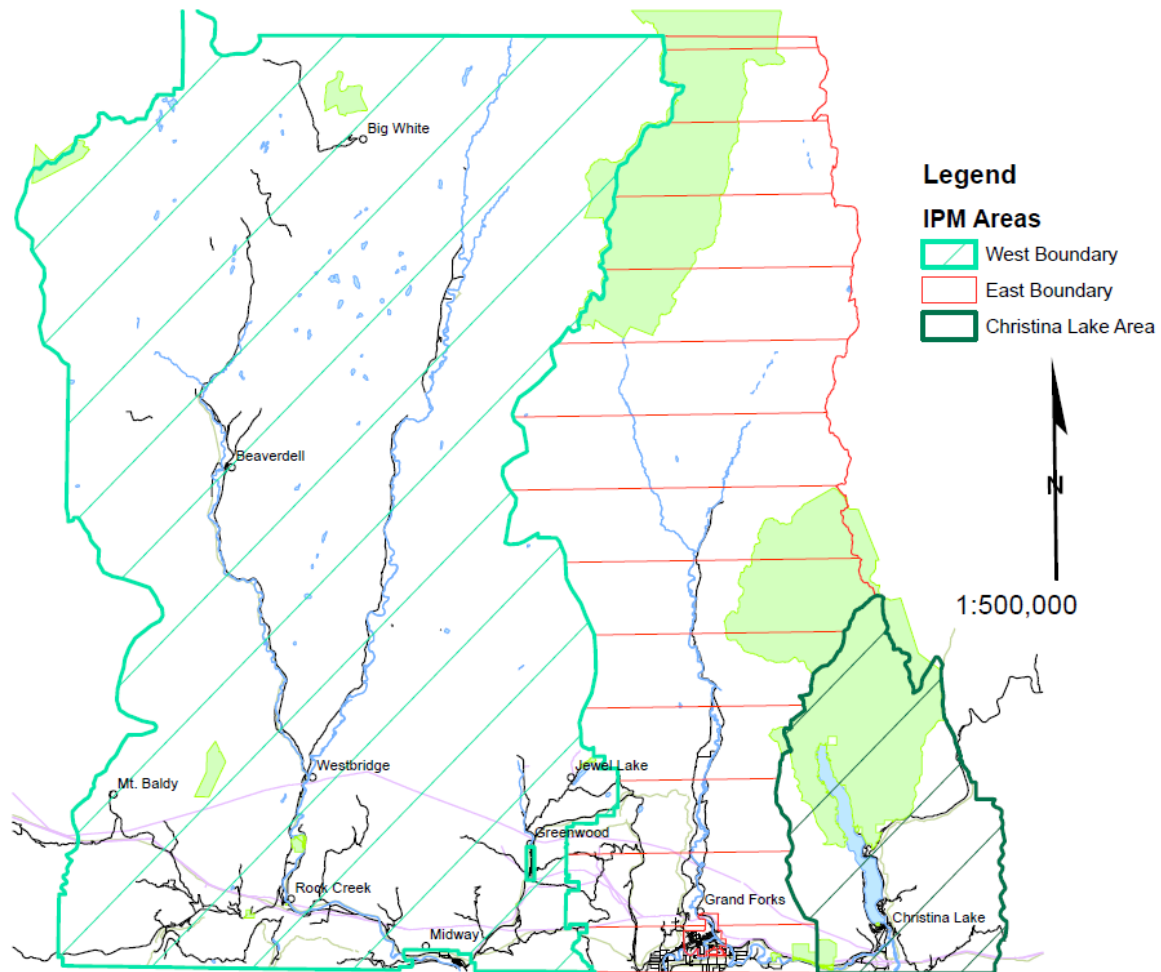


Figure 1. Map of the Boundary area with the management areas shown.

3.0 Priorities for Invasive Plant Management

Only a subset of the introduced species present in the Boundary are considered invasive with the potential to cause negative impacts economically, environmentally or socially. Given the limited resources available it is important to focus management decisions on species where the most impact will be achieved. Preventing new species is the most cost-effective strategy, followed by control of species with limited distributions to prevent spread. Setting priorities for each species should follow these principles:

Principal 1: Prevention and early intervention provide the most cost-effective means of control.

Principle 2: Eradication of widely established invasive plants on a regional scale is not a reasonable expectation.

Principle 3: Prevention of spread of some invasive plant species is possible through a coordinated effort and establishment of containment lines.

Principle 4: Invasive plant treatments are most effective when they occur in the context of long-term management which includes post-treatment restoration or remediation activities.

Principle 5: Coordinated planning and implementation with key stakeholders provides the greatest likelihood of long-term success.

The species which could be considered for management under these guidelines include species already designated as invasive (or noxious) under current legislation in addition to species present on lists from adjacent jurisdictions that are not legislated in BC. The list generated for the Boundary has been limited to mainly plants (terrestrial and aquatic) and some aquatic animal species. Additional species groups may be added in the future if needed. Information from risk assessments was used, where available; however, this information is only available for a few of the species. Criteria considered when setting species priorities included:

- **Risk of spread** (based on a combination of available habitat, biological methods of reproduction and the dispersal potential of the plant itself or via anthropogenic vectors of spread);
- **Level of “invasiveness”** (e.g. competitive ability, mode of reproduction, behaviour in similar ecosystems in other jurisdictions, does it out-compete existing vegetation to form dense stands, etc.);
- **Potential to cause economic, environment, social harm;**
- **Legal designation for control** (e.g. BC Weed Control Act, BC Forest and Range Practices Act); and
- **Likelihood of success in management**, which depends on a combination of the control methods/tools available for the specific species, and its current range or distribution. New infestations and/or species with limited distribution are more likely to be successfully controlled than larger, well-established populations.

Table 1. Prioritization of invasive species based on management focus

Program Level	Status	Management Focus
Watch List (Prevention)	New Species, not present in BC or in the Plan Area, likely to establish if introduced.	Early Detection and Rapid Response; Assess new species not currently on list.
Eradication or Annual Control (Category 1)	Species that are new to the management area with limited distribution and low density on infested sites; and/or Species invading susceptible habitats, sensitive areas, or sites containing red- or blue-listed species.	Eradication or the permanent removal of 100% of an invasive species from a selected site or area. This is usually only attainable for small, isolated patches/clumps of an invasive plant or noxious weed species and may take many years of repeated treatments to be achieved.
Containment (Category 2)	New infestations of established species in the area outside of the main population. Can include established infestations along transportation corridors and areas of concentrated activities such as trails, campgrounds, parking lots, garbage dumps, maintenance yards, and gravel pits. For some species in this category, where agreement among agencies conducting invasive plant management programs in the area is reached, a containment line can be established and mapped online in the provincial database. (Regional EDRR)	Containment to the current location and/or distribution. Preventing or reducing access to areas with invasive species infestations is also a strategy employed in containment. Herbicide treatments or other removal method would generally only occur within the containment boundary if sensitive sites or unique resources were at risk;
Strategic Control (Category 3)	Established low-density or high-density infestations that are widely distributed and common throughout the Boundary area; and Eradication or Containment is no longer possible within the management area. Targeted treatment for specific values or management objectives.	Treatments will be focused on high value or sensitive areas only, either for economic, environmental, or social reasons.
Biological Control (Category 4)	Established low-density or high-density infestations where effective biological control agents are established.	To suppress plant populations through biological control insect releases and monitoring effectiveness.
Unclassified	Species which are present but are either not considered invasive or have not yet been assessed.	To assess species that have not been assessed.

Table 2. Category 1 invasive species with a management goal of eradication or annual control.

Common Name	Scientific Name	Legislation		Known Locations	Invasive Plant Management Area Current Category		
		FRPA	WCA		West Boundary	East Boundary	Christina Lake Area
Aquatic							
Fragrant waterlily	<i>Nymphaea odorata</i>			Christina Lake, Christina Creek	WL	WL	1
Terrestrial							
Common teasel	<i>Dipsacus fullonum</i>	X		Gibbs Creek	1	1	1
Cutleaf blackberry	<i>Rubus laciniatus</i>			Christina Lake	1	1	1
Field scabious	<i>Knautia arvensae</i>	X	REG	Boundary Creek	1	WL	WL
Greater knapweed	<i>Centaurea scabiosa</i>			North of Grand Forks on TCT	WL	1	WL
Himalayan blackberry	<i>Rubus armeniacus</i>			Christina Lake	1	WL	1
Knotweed - Bohemian	<i>Reynoutria x bohemica</i>	X	PROV	Escaping gradens and waste dumps	1	1	1
Knotweed - Giant	<i>Reynoutria sachalinensis</i>	X	PROV	Escaping gradens and waste dumps	1	1	1
Knotweed -Japanese	<i>Reynoutria japonica</i>	X	PROV	Escaping gradens and waste dumps	1	1	1
Longspine sandbur	<i>Cenchrus longispinus</i>			Christina Lake	1	WL	1
North Africa grass	<i>Ventenata dubia</i>		PROV	Zamora, Rock Creek, Spencer Hill, N Fork Rd, Gilpin, Hwy 395	1	1	1
Plumeless Thistle	<i>Carduus acanthoides</i>	X	REG	Dan O'Rae FSR, Fife FSR, Santa Rosa FSR	1	1	1
Policeman's helmet / Himalayan balsam	<i>Impatiens glandulifera</i>			McRae Creek, also suspected to be present in gardens	WL	WL	1
Puncturevine	<i>Tribulus terrestris</i>		REG	Midway	1	WL	WL
Queen Anne's lace	<i>Daucus carota</i>			Hwy 3 small patches	1	1	1
Rush skeletonweed	<i>Chondrilla juncea</i>	X	PROV	North Fork Rd, Overton Creek, Hwy 395	WL	1	1
Russian Knapweed	<i>Acroptilon repens</i>	X	REG	Rock Creek and Midway	1	1	1
Scotch broom	<i>Cytisus scoparius</i>	X		Christina Lake	1	WL	1
Scotch Thistle	<i>Onopordum acanthium</i>	X	REG	Johnstone, Bridesville, Grand Forks	1	1	WL
Tansy ragwort	<i>Senecio jacobaea</i>	X	PROV	Beaverdell - FSRs to the west	1	WL	WL
Tree of heaven	<i>Ailanthus altissima</i>			Rock Creek , Grand Forks, Christina Lake, Cascade	1	1	1
Yellow Flag iris	<i>Iris pseudacorus</i>	X	PROV	Idabel Lk, Saunier Lk, Eugene Ck, Johnstone Ck, Ingram, Jewel Lk, Moody Pond, Christina Lk, Christina Ck.	1	1	1

Table 3. Category 2 invasive species with a management goal of control and contain.

Common Name	Scientific Name	Legislation		Known Locations	Invasive Plant Management Area Current Category		
		FRPA	WCA		West Boundary	East Boundary	Christina Lake Area
Aquatic							
Curly leaf pondweed	<i>Potamogeton crispus</i>			Christina Lake	1	1	2
Eurasian Watermilfoil	<i>Myriophyllum spicatum</i>			Idabel Lake, Christina Lake, Christina Creek	2	2	2
Terrestrial							
Baby's breath	<i>Gypsophila paniculata</i>	X		Rock Creek, Midway, small patches elsewhere throughout Boundary	2	1	1
Blueweed	<i>Echium vulgare</i>	X	REG	Christina Lake area	1	1	2
Common bugloss	<i>Anchusa officinalis</i>	X	REG	Rock Creek, Nicholson, Kettle Valley, Ingram, Midway, small patches elsewhere throughout Boundary	2	1	WL
Common tansy	<i>Tanacetum vulgare</i>	X	REG	Mainly Sidley with isolated patches throughout Boundary	2	2	2
Cypress spurge	<i>Euphorbia cyparissias</i>			Escaping gardens in several places	2	2	2
Himalayan knotweed	<i>Polygonum polystachyum</i>		PROV	Escaping gardens in several places	2	2	2
Hoary alyssum	<i>Berteroa incana</i>	X	REG	Most widespread in Grand Forks and Christina Lake areas, spread elsewhere throughout communities	2	2	2
Hoary cress	<i>Cardaria draba</i>	X	REG	Beaverdell, Sidley, Bridesville, Rock Creek, Midway, Grand Forks	2	1	1
Leafy spurge	<i>Euphorbia esula</i>	X	PROV	Johnstone, Zamora, Rock Creek, Nicholson, Spencer Hill, Paulson	2	2	1
Myrtle spurge	<i>Euphorbia myrsinites</i>			Grand Forks, also suspected to be present in gardens	WL	2	WL
Russian olive	<i>Elaeagnus angustifolia</i>			Private land and escaping	2	2	2
Tamarisk/Saltcedar	<i>Tamarix spp.</i>			Contained to private land	2	2	2
Yellow Archangel	<i>Lamium galeobdolon</i>			Christina Lake, escaping gradens and waste dumps	2	2	2

Table 4. Category 3 invasive species with a management goal of strategic control.

Common Name	Scientific Name	Legislation		Known Locations / Management Notes	Invasive Plant Management Area Current Category		
		FRPA	WCA		West Boundary	East Boundary	Christina Lake Area
Terrestrial							
Absinth wormwood	<i>Artemisia absinthium</i>			Contain Greenwood / Kerr Creek area	3	3	3
Bachelor's button	<i>Centaurea cyanus</i>			Ingram, gardens, waste dumps	3	WL	WL
Black locust	<i>Robinia pseudoacacia</i>			Found on private land and escaping onto public roads	3	3	3
Burdock	<i>Arctium species</i>	X	REG	Present along creeks, rivers, wetlands throughout Boundary	3	3	3
Bromes - introduced annual	<i>Bromus tectorum</i> <i>Bromus japonicus</i> <i>Bromus hordeaceus</i>			Widespread throughout Boundary, manage in sensitive grasslands if funding available	3	3	3
Chicory	<i>Chicorium intybus</i>			Private land and roadside throughout Boundary	3	3	3
Curlycup gumweed	<i>Grindelia squarrosa var serrulata</i>			Spreading along roads throughout Boundary, manage to reduce expansion into sensitive grasslands	3	3	3
Kochia	<i>Kochia scoparia</i>		REG	Rock Creek area	3	3	3
Nodding Thistle	<i>Carduus nutans</i>	X		Widespread in West Boundary, spreading into rural Grand Forks, manage in East Boundary IPMA, Christina Lake Area IPMA, and where adjacent to USA border in West Boundary IPMA	3/4	3	3
Norway maple	<i>Acer platanoides</i>			Common in yards throughout Boundary and escaping into creeks / rivers, manage when funding available	3	3	3
Orange hawkweed	<i>Hieracium aurantiacum</i>	X	REG	Widespread in northern Boundary areas and spreading along FSRs southward, elevate management if resources available	3	3	3
Oxeye daisy	<i>Leucanthemum vulgare</i>	X	REG	Widespread throughout Boundary, move to biological control when agents available	3	3	3
Russian thistle	<i>Salsola kali</i>		REG	Several places throughout Boundary	3	3	3
Scentless chamomile	<i>Matricaria perforata</i>	X	PROV	Several places throughout Boundary	3	3	3
Siberian elm	<i>Ulmus pumilla</i>			Private land and roadside throughout Boundary, manage along roadsides	3	3	3
Spotted Knapweed	<i>Centaurea stoebe</i>	X	PROV	Found across Boundary contain to containment area, strategic control within containment area	3	3	3
Sulfur cinquefoil	<i>Potentilla recta</i>	X	REG	Widespread throughout Boundary, manage where managing other species	3	3	3
Yellow-flowered non-native hawkweeds	<i>Hieracium spp.</i>	X		Widespread in northern Boundary areas and spreading along FSRs southward, elevate management if resources available	3	3	3

Table 5. Category 4 invasive species with a management goal of biological control.

Common Name	Scientific Name	Legislation		Known Locations / Management Notes	Invasive Plant Management Area Current Category		
		FRPA	WCA		West Boundary	East Boundary	Christina Lake Area
Terrestrial							
Bull Thistle	<i>Cirsium vulgare</i>	X		present throughout boundary	4	4	4
Canada Thistle	<i>Cirsium arvense</i>	X	RPOV	Rely on biological control	4	4	4
Common / yellow toadflax	<i>Linaria vulgaris</i>	X	PROV	Rely on biological control	4	4	4
Dalmatian toadflax	<i>Linaria dalmatica</i>	X	PROV	Rely on biological control	4	4	4
Diffuse Knapweed	<i>Centaurea diffusa</i>	X	PROV	Rely on biological control	4	4	4
Field bindweed	<i>Convolvulus arvensis</i>			Rely on biological control	4	4	4
Hounds tongue	<i>Cynoglossum officinalis</i>	X	PROV	Rely on biological control	4	4	4
St. John's wort	<i>Hypericum perforatum</i>	X		Rely on biological control	4	4	4

4.0 Prevention and Best Practices

Preventing introduction is the most cost-effective way to manage invasive species. Many species follow similar pathways of introduction, so it is important to target and address common pathways of introduction rather than individual species prevention. Most aquatic invasive species are not yet present in our area making prevention a high priority. Initiatives that should be promoted include Don't Let it Loose for properly disposing of aquarium contents, Clean-Drain-Dry of watercrafts, and the PlantWise program. The BISS has an annual work plan focused on prevention and identification and will be developing a communications plan for the Boundary. Until the plan is in place messaging with nearby regions will continue to be used.

Preventing the spread of invasive species already present in the Boundary requires diligence. A series of best practices should be followed to reduce spread while conducting various activities on the land. Best practices include minimizing soil disturbance, re-vegetating exposed soil, using invasive-free seed, cleaning vehicles and equipment, using weed-free gravel, and careful disposal of invasive plant material. With respect to invasive plant species, best practices are available for road maintenance and construction, forestry activities, and for residential land development.

5.0 Early Detection and Rapid Response (EDRR)

Early detection of new invasive plant species enables treatment before they are allowed to spread and cause serious impacts. This approach is both cost effective and reduces the risk to the environment. A provincial EDRR strategy for invasive species that are new to BC is in place ⁴. Species new to the province fall under this process and the province will perform a risk assessment and lead in the management response. Species that are expected to eventually arrive in the province have undergone risk assessments prior to their arrival. A new species is typically present for twenty years before it is found (per comm R. Olds). The success of an early detection program will depend on establishing a network of people trained to identify new species to enable reporting of infestations at early stages of infestation. BISS and other agencies should promote the provincial *Report Invasives BC* app for reporting.

A regional EDRR protocol has been developed to provide guidance on dealing with new species to the Boundary that are already present in the province and not being controlled under the Province of BC EDRR program. Climate and site conditions can limit suitability for new species, so it is important to assess the potential of a new species to be invasive within the Boundary area. Habitat suitability modelling has been completed for seven species that are already present. There is very little information available on the potential range of most invasive plants so the known distribution and impacts in similar areas is used as a guide for whether a plant will become a problem in a new area. Where information is not available for a species a precautionary approach will be used based on professional judgement. Table 5 contains a Watch List of species near our jurisdictional boundaries that would be considered regional EDRR species if they were to be found in the Boundary. For provincial EDRR species inventory is done by province but they do not do inventory for regional EDRR species. Some local staff training is needed on recognising watch list species to increase likelihood of detection at an early stage. This could be done for many species by doing a field trip down into Okanogan and Ferry Counties to see locations the plants are growing.

5.1 EDRR Protocol

The following protocol outlines the steps to follow to deal with new species found in the Boundary.

⁴ Province of BC Invasive species early detection and rapid response (EDRR) website available at: [Province of BC EDRR program](#)

1. Spotter reports the sighting to the BISS and the BISS immediately reports sightings of provincial EDRR species to the provincial Invasive Plant Specialist (for terrestrial and aquatic plants), the Terrestrial Invasive Fauna Specialist (for terrestrial animals), or the Aquatic Invasive Fauna Specialist (for aquatic animals).
2. A BISS representative visits the site to confirm the identification of the species, record GPS coordinates, take photos, and collect a voucher. If the species cannot be identified, voucher specimens and photos will be submitted to the appropriate provincial specialist for confirmation. Information will also be shared with the regional Invasive Plant Specialist and the spotter. The affected landowner will be kept involved.
3. If the species is new to BC, the provincial Invasive Plant Specialist will trigger the Provincial EDRR Response Plan ⁵. If a species is not provincial EDRR it is referred to BISS to determine its risk. BISS will seek information on risk from other regions, provincial staff, or neighbouring jurisdictions. If unsure of whether to deal with the species, then control should be undertaken to at least stop seed or vegetative spread until further information is available. If there is any question of whether it is a native species, then treatment should be delayed until identification is confirmed.
4. If the species is considered Regional EDRR for the Boundary but not for BC, the BISS will contact the landowner to further inventory the area to determine the full extent of the species, and to develop a strategy for eradication. If possible, all root and seed material will be bagged immediately until further treatments can be conducted. For aquatic species BISS will work with provincial staff to develop a management plan.
5. The BISS will issue an alert on presence of the new species through the BISS contact network during the field season.
6. The BISS will enter the site into the provincial InvasivesBC database during the calendar year.

Table 5. Aquatic invasive plant watch list (species not present in the Boundary).

Common Name	Scientific Name	FRPA	WCA	Closest Location Known
Aquatic Plants				
Common/European frogbit	<i>Hydrocharis morsus-ranget</i>			Present in Washington
Giant salvinia	<i>Salvinia molesta</i>			Present in Texas
Parrotfeather	<i>Myriophyllum aquaticum</i>			Vancouver, BC; Washington; Boise ID.
Water chestnut	<i>Trapa natans</i>			present in eastern US
Water Hyacinth	<i>Eichhornia crassipes</i>		PP	Hagerman, ID. Snake River
Yellow Floating Heart	<i>Nymphoides peltata</i>			Stevens County and Clark County (coast) WA
Fanwort	<i>Cabomba caroliniana</i>			King county WA (on coast)
Hydrilla	<i>Hydrilla verticillata</i>		PP	King county WA (on coast)
Variable-Leaf-Milfoil	<i>Myriophyllum heterophyllum</i>			Fraser Valley, BC

⁵ Invasive Species Early Detection and Rapid Response Plan for British Columbia available at: [EDRR Plan BC](#)

Brazilian Elodea/ Waterweed	<i>Egeria densa</i>	PP	Vancouver Island and several counties on the coast of Washington; Moscow, ID.
European Common Reed	<i>Phragmites australis</i>	PP	Osoyoos, BC
Flowering Rush	<i>Butomus umbellatus</i>	pn	Pend Oreille River, ID
Garden Yellow Loosestrife	<i>Lysimachia vulgaris</i>	PP	Vancouver and Vancouver Island
Giant Mannagrass / Sweetgrass Reed	<i>Glyceria maxima</i>	PP	Fraser Valley, BC

Table 6. Terrestrial invasive plant watch list (species not present in the Boundary).

Common Name	Scientific Name	FRPA	WCA	Closest Location Known
Terrestrial Plants				
African-rue	<i>Peganum harmala</i>		PP	Grant County, WA (south of Okanogan)
Bighead Knapweed	<i>Centaurea macrocephala</i>		PP	Okanogan and Pend Oreille Counties
Black Henbane	<i>Hyoscyamus niger</i>		PP	Ferry County north of Curlew Lake, WA.
Black Knapweed	<i>Centaurea nigra</i>	x		Ferry Count, WA
Blackgrass, Foxtail, Slender/Meadow	<i>Alopecurus myosuroides</i>		PP	Lincoln and Spokane County, WA
Brown Knapweed	<i>Centaurea jacea</i>			Okanagan valley; Nakusp?; Pend Oreille County, WA
Camel Thorn	<i>Alhagi maurorum</i>		PP	Grant County, WA (south of Okanogan)
Clary Sage	<i>Salvia sclarea</i>		PP	Stevens County, WA
Common Crupina	<i>Crupina vulgaris</i>		PP	Okanogan County, WA
Dyer's Woad	<i>Isatis tinctoria</i>		PP	Eholt
Eggleaf Spurge	<i>Euphorbia oblongata</i>		PP	coastal washington
Garlic Mustard	<i>Alliaria petiolata</i>		PP	Vernon, BC
Giant hogweed	<i>Heracleum mantegazzianum</i>			Slocan Valley and Kaslo
Giant Reed	<i>Arundo donax</i>		PP	California, may be in BC
Goatsrue	<i>Galega officinalis</i>		PP	Whatcom County, WA (coast)
Halogeton/Saltover	<i>Halogeton glomeratus</i>		PP	southern WA and ID
Iberian Starthistle	<i>Centaurea iberica</i>		PP	Kittitas County, WA (south of chelan county)
Italian Thistle	<i>Carduus pycnocephalus</i>		PP	Whitman County (south of Spokane County)
Johnsongrass	<i>Sorghum halepense</i>		PP	Chelan and Douglas County, WA

Jointed goatgrass	<i>Aegilops cylindrica</i>		PP	Ferry and Stevens County, WA
Kudzu	<i>Pueraria montana</i> var. <i>lobata</i>		PP	Washington
Meadow Clary	<i>Salvia pratensis</i>		PP	Stevens County, WA
Meadow Knapweed	<i>Centaurea nigrescens</i>	x	RO	Vernon, BC; Pend Oreille County, WA; Rossland.
Meadow Salsify	<i>Tragopogon pratensis</i>			old record in Christina Lake, BC
Mediterranean Sage	<i>Salvia aethiopis</i>		PP	southern WA and Central ID
Medusahead	<i>Taeniatherum caput-medusae</i>		PP	
Milk Thistle	<i>Silybum marianum</i>			confirm if in local gardens
Mountain Bluet	<i>Centaurea montana</i>			contain to gardens
Mouse-ear hawkweed	<i>Hieracium pilosella</i>			Christina Lake
Perennial Pepperweed	<i>Lepidium latifolium</i>	x	PP	
Purple Nutsedge	<i>Cyperus rotundus</i>		PP	Oregon
Purple Starthistle	<i>Centaurea calcitrapa</i>		PP	Adams County, WA (central)
Purple loosestrife	<i>Lythrum salicaria</i>	x		Osoyoos, BC and Arrow Lakes
Red Bartsia	<i>Odontites serotinus</i>		PP	Alberta
Ricefield/ Bog Bulrush	<i>Schoenoplectus mucronatus</i>		PP	Oregon
Rush skeletonweed	<i>Chondrilla juncea</i>	x	PN	Vernon, BC and slocan valley
Shiny Geranium	<i>Geranium lucidum</i>		PP	Washington (coast)
Silverleaf Nightshade	<i>Solanum elaeagnifolium</i>		PP	southeast Washington
Slender False-brome	<i>Brachypodium sylvaticum</i>		PP	
Slenderflower Thistle	<i>Carduus tenuiflorus</i>		PP	Washington (coast)
Spanish Broom	<i>Spartium junceum</i>			
Spring Milletgrass	<i>Milium vernale</i>		PP	
Spurge Flax	<i>Thymelaea passerina</i>		PP	Okanogan WA
Squarrose Knapweed	<i>Centaurea virgata</i>		PP	
Syrian bean-caper	<i>Zygophyllum fabago</i>		PP	
Texas blueweed	<i>Helianthus ciliaris</i>		PP	
Velvetleaf	<i>Abutilon theophrasti</i>		PP	
Wild four-o'clock	<i>Mirabilis nyctaginea</i>			Okanogan WA
Yellow Nutsedge	<i>Cyperus esculentus</i>		PP	
Yellow Starthistle	<i>Centaurea solstitialis</i>	x	PP	Kettle Falls, WA

Table 7. Aquatic invasive animal watch list (species not present in the Boundary).

Common Name	Latin Name	Type	Controlled Alien Species Regulation
<u>Zebra Mussel</u>	<u>Dreissena polymorpha</u>	Aquatic Invertebrates	Prohibited
<u>Quagga Mussel</u>	<u>Dreissena rostriformis bugensis</u>	Aquatic Invertebrates	Prohibited
<u>New Zealand Mud Snail</u>	<u>Potamopyrgus antipodarum</u>	Aquatic Invertebrates	Prohibited
<u>Asian Clam</u>	<u>Corbicula fluminea</u>	Aquatic Invertebrates	
<u>American Bullfrog</u>	<u>Lithobates catesbeianus</u> / <u>Rana catesbeiana</u>	Amphibians	
<u>Red-eared Slider</u>	<u>Trachemys scripta elegans</u>	Reptiles	
<u>Snapping Turtle</u>	<u>Chelydra serpentina</u>	Reptiles	Prohibited
<u>Red Claw Crayfish</u>	<u>Cherax quadricarinatus</u>	Aquatic Invertebrates	Prohibited
<u>Yabby Crayfish</u>	<u>Cherax albidus</u> , <u>Cherax destructor</u>	Aquatic Invertebrates	Prohibited
<u>Rusty Crayfish</u>	<u>Orconectes rusticus</u>	Aquatic Invertebrates	Prohibited
<u>Red swamp crawfish</u>	<u>Procambarus clarkii</u>	Aquatic Invertebrates	Prohibited
<u>Spiny Waterflea</u>	<u>Bythotrephes cederstroemi</u>	Aquatic Invertebrates	Prohibited
<u>Fishhook Waterflea</u>	<u>Cercopagis pengoi</u>	Aquatic Invertebrates	Prohibited

6.0 Inventory and Monitoring

Inventories and surveys ⁶ provide the basic information necessary to prioritize locations for management action. Accurate distribution information is essential to planning an effective management program. Location information on invasive species occurrences is housed in the online InvasivesBC database and the program has standards for data collection. Habitat susceptibility models have been developed for seven species in our region but this has not been completed for other species since there was not enough life history information to complete the analysis.

Inventory efforts will focus on new species to the Boundary in high-risk areas for introduction based on likely pathways. The use of digital data collection is efficient, enabling real time sharing of maps, treatment progress, and site pictures.

Sites with species designated for Eradication or Annual Control (regional Cat. 1) will be monitored at least once per season to ensure effective control and that the sites have not expanded beyond known boundaries.

Efficacy monitoring will be done on all sites and species designated for Eradication or Annual Control (regional Cat. 1) in addition to other sites for a combined minimum of 10% of all sites treated with herbicide. Additional monitoring will be done on hard to kill species (ex. blueweed, common bugloss) to ensure herbicide treatments are achieving desired levels of control. Where deficiencies are found herbicide experts will be consulted to review herbicide efficacy, timing, and equipment to determine if more effective control can be achieved. This is currently being done for common bugloss and blueweed.

⁶ In this plan the terms inventory and survey are used interchangeably. Technically, " ... an inventory is a cataloguing of all invasive plants of concern within a management area, whereas a survey is an individual observation or a sampling of a representative portion of a larger landscape" such as a road survey. (BC Ministry of Forests and Range 2010)

7.0 Coordination and Partnerships

Coordination between provincial agencies, regional districts, municipalities, utility companies, and private landowners reduces duplication of effort, increases availability of invasive species related information, and increases the effectiveness of the invasive species program. BISS has been successful in getting many organizations involved in the program and currently acts as the main coordinating body for stakeholder management programs. The Regional District of Kootenay Boundary (RDKB) plays a key role in administration and coordination of operational herbicide treatment programs through a partnership delivery model where the RDKB administers funding from other stakeholders and hires contractors to deliver treatment for all participating stakeholders. Partnerships have been formed with adjacent invasive plant management groups. Work will continue to explore opportunities to support invasive species related work of other local organizations.

8.0 Planning and Management

Planning management strategies and designing site-specific treatments is critical to the delivery of an effective program. The focus will remain on invasive plants, primarily terrestrial plants until there is sufficient resources to implement management for non-plant invasive species. Integrated pest management principals will be used in designing management programs using effective management options for each species. The overall long-term goal is to maintain a robust local agricultural economy and maintain healthy ecosystems that are relatively invasive species free and resistant to invasion. Management options available include prevention, biological control, mechanical control, and herbicide control. Containment areas may be established for widespread species and if they are established within some areas and limited in others. The partnership delivery of the biological control program will shift to focus more on monitoring and less on collection and release until new biological control agents are provided by the province.

An annual work plan will be developed each year for the planning areas based on species priorities and will be updated through the season based on inventory and monitoring findings. The presence of species at risk will be considered when planning management activities. Information on current know locations of species and habitats at risk are available from the *Province of BC Species & Ecosystems Explorer*⁷.

9.0 Education

The ability to recognize and be aware of the impacts of invasive species is a key component towards effectively addressing the invasive species problem. The activities of the BISS education program over the past couple decades has achieved a general awareness by residents that invasive species are impacting our resources. Most Boundary residents can now identify multiple invasive species, but more work is needed to inform the public on how to recognize and manage all species present in the region. The education program has shifted focus to include aquatic species and to prevent spread through common pathways rather than focusing on specific species. With this approach, people do not need to know how to recognize all species but rather need to know what activities to do to prevent introduction or spread of any species. For more details on specific activities refer to the *Boundary Invasive Species Outreach and Education Plan*.

10.0 Enforcement

The Village of Midway is the only authority in the Boundary enforcing control of invasive plants under its unsightly premise bylaw. The RDKB does not currently enforce control of invasive plants. Discussion by electoral directors in recent years indicated an interest in possibly pursuing enforcement for Eradication

⁷ Online Province of BC Species & Ecosystems Explorer webpage available at: [BC Species & Ecosystems Explorer](#)

or Annual Control (regional Cat. 1) species only; however, this discussion will need to continue. Any work to establish enforcement should encompass all invasive species rather than just terrestrial plants.

11.0 Program Evaluation

In order to have a fully effective invasive species program, an evaluation process is required to track the progress towards achieving management objectives. The completion of short-term (1- to 3-year) objectives and longer-term (5-year) objectives will be assessed each year at the fall stakeholders meeting with a summary presented including recommended changes to improve the program. Boundary area species lists will be developed and sent out each year with guidance from the spring planning meeting which brings together land managers and residents from across the Boundary region. Program activities will be summarized in an annual report each year and provided at the spring planning meeting.

APPENDIX 1: Information Sources

Species Identification:

- [E-flora BC](#) - a comprehensive online searchable database with info on plant species present in BC.
- [Field Guide to Noxious and Other Selected Invasive Plants of BC](#) - has all the provincial and regional noxious weeds in BC.
- [New Invaders of the Northwest](#) - has potential new invasive plants from the Pacific Northwest.
- [USDA Plant Database](#) - has information on whether a species has been listed as noxious or invasive.
- [Okanagan Invasive Species Online](#) - contains aquatic and terrestrial invasive plants and animals of concern in the Okanagan region with relevance to the Boundary area

Invasive Plant Management:

- BC Ministry of Forests website has information on integrated pest management for invasive species - [Integrated Pest Management for Invasive Species - Province of British Columbia](#)
- [Biological Control Agents in BC](#) – information on biological control insects being used in BC and their status.
- Backpack calibration video by ISCBC - <http://www.youtube.com/watch?v=qBbv9Ouag7Q>

Reporting Invasive Plants Locations:

- [InvasivesBC](#) - is an online database with invasive plant locations in BC.
- [Report Invasives](#) - is an online reporting system for invasive plants with an app available for smartphones.
- To report invasive mussels, contact the RAPP line at: **1-877-952-7277**

Invasive Plant Legislation:

- [Weed Control Act of BC](#)
- [Weed Control Regulation](#)
- [Forest and Range Practices Act](#)
- [Invasive Plants Regulation](#)
- [Community Charter Act Environment and Wildlife Regulation](#)

General Information and Best Practices:

- [Invasive Species Council of BC \(ISCBC\)](#) - has information on programs across BC including TIPS factsheets on invasive plants, some best practices guidebooks and other resource materials.
- [Protect Your Waters](#) - has information on preventative measures to prevent spread of aquatic invasive species.

Species and Habitats at Risk:

- [BC Conservation Data Centre](#) - searchable online database with information on occurrence of Species at Risk in BC.
- [BC Species and Ecosystem Explorer](#) - searchable database that lists species at risk in BC.
- Important Bird Areas - online database of important bird areas.
- Wildlife Tree Stewardship Initiative - info on the Wildlife Tree Stewardship Program in BC.

APPENDIX 2: Boundary Invasive Species Society Contact Information

General Inquiries:

info@boundaryinvasives.com
250-446-2232

Physical Address:

Suite 4 - 3990 Hwy 3
Rock Creek BC, V0H 1Y0

APPENDIX 3: Land Jurisdictions with Responsibility for Management of Invasive Species

Jurisdiction	Type	Occupier	Responsibility and/or Legislation	Tenure
Federal	Airport Lands	Transport Canada	Local governments - Village of Midway and City of Grand Forks manage the airports	?
	Traditional Territories	Bands		Add list of current bands with claims
Provincial	Provincial public range and forest lands, Woodlots	FLNRO	Forest Act, Range Act, Forest and Range Practices Act	Forest and Range Practices Act Agreements
	Grazing Leases	FLNRO	Land Act	Grazing Leases
	Grazing Leases	BC Parks	Park Act	Recreational permits; Grazing; Utilities; Park use permits; Park facility operators
	Parks, Class A and C	BC Parks	Park Act	Recreational permits; Grazing; Utilities; Park use permits; Park facility operators
	Ecological Reserve	BC Parks	Park Act, Environmental and Land Use Act	Recreational permits; Grazing; Utilities; Park use permits; Park facility operators
	Conservancies	BC Parks and Partners	Ecological Reserve Act	Park Use Permits
	Conservation Lands (owned by conservation organization)	FLNRO	Wildlife Act, or private land	?
	Public highways and secondary roads	MOTI		maintenance contractors
	Utilities	FLNRO		Utility Companies (Fortis BC, BC Hydro)
	Crown leases (commercial, residential, recreational, gravel pits)	FLNRO		Various (individuals, businesses, NGOs, etc.)

	Recreation Sites and Trails	FLNRO		FLNRO and some community groups (GFAA)
	Waterbodies	MOE	?	Permits required to do any work below the high watermark on all waterbodies.
	Waterbodies	DFO	Fisheries Act	Notification or permit required to do any work below the high watermark on all waterbodies.
Private	Located within a regional district		Local Bylaws; Weed Control Act; Controlled Alien Species Regulation	all landowners
	Located within a municipality		Local Bylaws; Weed Control Act; Controlled Alien Species Regulation	all landowners
	Gravel pit		Mines Act?	
Regional District Lands			Weed Control Act; Controlled Alien Species Regulation	
Municipal Lands			Weed Control Act; Controlled Alien Species Regulation	