Columbia Shuswap
Operational Plan for Invasive Species
2026 - 2031




Prepared by: Columbia Shuswap Invasive Species Society

with input from land managers in the Columbia Shuswap region

CSISS
COLUMBIA SHUSWAP INVASIVE SPECIES SOCIETY

Updated 2026

Acronyms and Abbreviations

CSISS	Columbia Shuswap Invasive Species Society
BC	British Columbia
CSRD	Columbia Shuswap Regional District
IPMA	Invasive Plant Management Area
BMP	Best Management Practices
EDRR	Early Detection Rapid Response
ISCBC	Invasive Species Council of British Columbia

Acknowledgements

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We wish to thank the following organizations who participated in meetings to update this version of the Operational Plan:

- Ministry of Forests
- BC Hydro
- District of Sicamous
- Parks Canada
- Town of Golden
- Interested residents

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1.0 Introduction

This Operational Plan was prepared by the CSISS to provide a framework for invasive species management activities within the Columbia Shuswap region. Since invasive species cross multiple jurisdictions, a cooperative and collaborative approach is essential to ensure that invasive species management activities are not hindered by geographic, jurisdictional, and political boundaries. By adopting a cooperative approach, land managers can more efficiently utilize limited funds and personnel, and can collaboratively achieve mutual objectives.

This Operational Plan provides direction to resource managers, community groups, Indigenous Peoples, and private citizens on invasive species of highest management priority for prevention, inventory, treatment and monitoring in the Columbia Shuswap region. It has been developed through an ongoing collaborative process through which many organizations provided guidance and input during meetings in Salmon Arm, Revelstoke and Golden in the fall of 2013; and subsequently, helped develop a new 2026-2031 Operational Plan.

The scope of this Operation Plan takes an "all invasive species" approach to determining the terrestrial, riparian, and aquatic invasive species that have the potential to impact the ecological, economic and/or social well-being of the region; and to facilitate their prevention, reduction, and management. This Operational Plan reflects local priorities for invasive species management within a five-year time frame with the understanding that the Operational Plan will be revisited annually.

1.1 Impacts of Invasive Species

The spread of invasive alien species is now recognized as one of the greatest threats to the ecological and economic well-being of the planet (Pyšek *et al.* 2020). In British Columbia (BC), it is estimated that 25% of our endangered species, 31% of our threatened species, and 16% of our species of special concern are negatively impacted by invasive alien species (Voller and McNay 2007). Without efforts to contain their spread, invasive species will generally increase their distribution area exponentially, making the task of eventual control impossible and financially insurmountable.

Detrimental impacts of invasive species on the agriculture industries include harbouring insects and diseases of crops, reducing crop quality, yield and market opportunities, and decreasing farm income and grazing opportunities. An estimated combined damage for six important invasive plants in BC was estimated to be at least $65 million in 2008 and with further spread, impacts would more than double to $139 million by 2020 (ISCBC 2009). In forestry, invasive plants compete with seedlings for light, nutrients, and water which reduces forest yield. Some invasive plant species are extremely flammable and can exacerbate natural fire cycles by causing an increased fuel bed load and frequency of fire. In addition, invasive insects and fungi can weaken forest health by infecting and killing off entire stands.

When established in crops, working forests or natural areas, invasive plants, animals and pathogens can result in a myriad of impacts, such as: reduced water quality and quantity; increased erosion and sedimentation; reduced property values; damage to private property and

infrastructure; loss of traditional food and medicinal plants; reduced land and water recreational opportunities; increased control and management costs; and export and import trade restrictions imposed. Invasive plants also impact human health and safety by obstructing sightlines and road signs along transportation corridors, as well as causing skin burns and dermatitis, and increasing allergies.

Invasive species also threaten biodiversity. Many rare and endangered species are at risk of extinction from non-native invasions of invasive plants and other alien organisms (Bellard *et al.* 2016). Without prevention or intense and costly management, invasive species can disrupt the natural migrations of wildlife since their habitat can be damaged or destroyed, with impacts to the local ecosystem often irreversible.

Given these potential impacts of invasive species, the Columbia Shuswap region has significant ecological, economic and social values and assets at risk. Therefore, land managers must work together on common priorities for prevention, reduction and management of invasive species.

1.2 Columbia Shuswap Invasive Species Society

The CSISS is a non-profit charitable society founded in April 2013, by a group of individuals and organizational representatives who recognized the need for a coordinated regional approach to the growing threat of invasive species in the CSRD. The vision statement of the CSISS states:

> *The environment, economy and society of the Columbia Shuswap region are stewarded from the adverse impact of invasive species.*

The purpose of CSISS (as per CSISS Strategic Plan) are:

- To coordinate and engage public, private landowners, land and aquatic managers, Indigenous Peoples and network of partners about invasive species and their impacts.
- To establish and operate invasive species management programs.
- To do all other things as are incidental and ancillary to the attainment of the above purposes and to operate a sustainable organization.

CSISS is not a landowner and does not hold land management responsibilities. Rather, CSISS is non-profit charitable organization that facilitates the prevention, reduction and management of invasive species through collaboration, coordination, and engagement. It is the responsibility of each land owner or occupier to manage invasive species within their jurisdiction.

1.3 Key Organizations and Land Managers

Given the diverse land use and ownership in the region, a collaborative and coordinated approach to invasive species management is extremely beneficial. Key partners in the Columbia Shuswap region include: the CSRD (which has a noxious weed program under bylaw #5110), Indigenous Peoples and First Nations, federal and provincial government agencies,

municipalities, utility companies, agriculturalists, conservation and stewardship groups, regional invasive species committees, private landowners, forest licensees, and industry.

This Operational Plan provides a framework for this diverse range of organizations and individuals to develop work plans for their own land that are consistent with the goals and objectives of other land managers. *Each land owner or occupier is responsible for prevention, containment, and/or control of invasive species within their jurisdiction* and in accordance with their mandates, legal obligations and procedures (e.g. Pest Management Plans, Range Use Plans, Forest Stewardship Plans, BC Weed Control Act).

2.0 Columbia Shuswap Region

The CSISS encompasses the geographic area of the CSRD. For the purposes of planning, this region has been divided into three Invasive Plant Management Areas (IPMAs): Salmon Arm, Revelstoke and Golden (Figure 1). The label "IPMA" will continue to be used even though it is understood that management strategies will expand to include non-plant invasive species.

Figure 1: Map of the IPMAs in the Columbia Shuswap Region.

2.1 Salmon Arm IPMA

The Salmon Arm IPMA includes CSRD Electoral Areas "C", "D", "E", "F" and G including the City of Salmon Arm and District of Sicamous. There are a number of Indian Reserves in this IPMA including Switsemalph, Salmon River, North Bay and Quaaout. This IPMA borders the Thompson Nicola Regional District and the Thompson-Nicola Invasive Plant Management Committee as well as the Regional District of North Okanagan. Herald, Shuswap Lake, Yard Creek, Albas, Silver Beach, St. Ives, Anstey Hunakwa, Shuswap Lake Marine, White Lake, Tsútswecw and Cinnemousun Narrows Provincial Parks are within this IPMA. Major transportation corridors include CPKC Rail, Highway 1, Highway 97A and Highway 97B. This IPMA encompasses the dry Ponderosa Pine to the wetter Interior Cedar Hemlock biogeoclimatic zones[1] including: PPxh2, MSdm3, IDFxh1, IDFxh2, IDFmw2, ICHdw4, IDFdk2, ICHwk1, ICHvk1, ICHmw3, ICHmw5, ICHmk2, ESSFwc2, ESSFwc4, ESSFvc, ESSFmh, and ESSFdc3.

2.2 Revelstoke IPMA

The Revelstoke IPMA includes CSRD Electoral Area "B" including the City of Revelstoke. This IPMA borders the Central Kootenay Invasive Species Society area to the south and the Northwest Invasive Plant Council to the north. Shelter Bay, Blanket Creek and Martha Creek Provincial Parks are included in this IPMA along with Mount Revelstoke and Glacier National Parks. Major transportation corridors include CPKC Rail, Highway 1, Highway 23N and Highway 23S. This IPMA is the wettest of the region, encompassing the following biogeoclimatic zones: ICHdw4, ICHmw3, ICHvk1, ICHwk1, ESSFrep, ESSFvc, ESSFvcp, ESSFwh1, ESSFwc4, ESSFwcp, ESSFdkw, and IMAun.

2.3 Golden IPMA

The Golden IPMA includes CSRD Electoral Area "A" including the Town of Golden. This IPMA borders the East Kootenay Invasive Species Council area to the south, Northwest Invasive Plant Council to the north, and Alberta to the east. This IPMA includes Marl Creek, Burges James Gadsen, and Cummins Lake Provincial Parks, as well as Yoho National Park. Major transportation corridors include CPKC Rail, Highway 1, and Highway 95. The IPMA includes the dry northern portion of the East Kootenay trench including the following biogeoclimatic zones: IDFdk5, ICHmw1, ICHwk1, ICHmk5, ICHvk1, MSdk, ESSFdk2, ESSFwcp, ESSFwc2, ESSFwcw, ESSFmmp, ESSFmm1, and IMAun.

3.0 Priorities for Invasive Species Management

CSISS promotes partnerships, practices, policies, tools and operations that prevent the introduction and spread of invasive species and facilitate collaborative management. These activities include: collaboratively prioritizing invasive species, following prevention and best management practices (BMPs), ensuring early detection and rapid response of new invaders,

[1] Biogeoclimatic zones based on maps from MFR at http://www.for.gov.bc.ca/hre/becweb/resources/maps/index.html.

conducting inventories to acquire enough information to make sound management decisions, coordinating treatment activities, monitoring efficacy, and ensuring that data are easily available.

A species-specific approach is limited in that it does not necessarily consider the entire ecosystem as a whole. Often invasive species management is an element of restoration where other factors are considered (such as prescribed burning, re-vegetation, better land management practices, wildlife habitat, rare plants, etc.). As well, many invasive plant species ranked as "low priority" in this Operational Plan may have detrimental impacts to a specific sector/land area and, in such cases, potentially all invasive plant species pose a threat and may be targeted for treatment, regardless of their regional priority. Land owners and occupiers are encouraged to consider their own land management objectives when prioritizing invasive species activities, and to consider this regional prioritization a tool to facilitate a coordinated approach.

3.1 Criteria for Prioritizing Invasive Species and Management Activities

Given limited resources for invasive species management, it is usually necessary to prioritize activities to achieve the "biggest bang for the buck". Invasive species can be prioritized for treatment based on the following factors (Figure 2; Figure 3):

- Risks from not managing the species;
- Phase of invasion (current and potential distribution);
- Effectiveness of available treatment strategies;
- Effectiveness and availability of biocontrol agents; and
- Priorities in neighbouring jurisdictions.

The *phase of invasion* may be determined by the current and potential distribution of the species in the Columbia Shuswap (Figure 2). Before a species arrives, the *prevention phase* includes activities such as distributing a "prevention watchlist" of species of concern, preventing intentional plantings or releases, cleaning vehicles and watercraft, and implementing other BMPs. During the *eradication phase,* the species has a very limited distribution and early detection rapid response efforts are likely to eradicate the species. As the population expands during the *containment phase*, eradication is no longer likely and efforts are focused on containing and controlling the expanding population before it becomes naturalized. Once the population reaches the *asset-based protection phase*, species are often too widespread or costly to control and restoration activities are focused on limited, high-priority sites.

It can be helpful for land managers to use prioritization and risk assessment tools when resources are limited in invasive species management. Annually, resources permitting, the CSISS will host a Columbia Shuswap Land Manager meeting to review this Operational Plan, the Columbia Shuswap priority lists for invasive plants by IPMA (Appendix D, E and F), and the watchlist for non-plant invasive species (Appendix G).

The presence/absence watchlist for non-plant invasive species (vertebrates, invertebrates, fungi, and pathogens) (Appendix G) is useful for education, outreach and prevention work, including

reporting; however, the watchlist is not a thorough risk assessment meant for active control programs. Land managers are encouraged to discuss control of non-plant species with Provincial specialists.

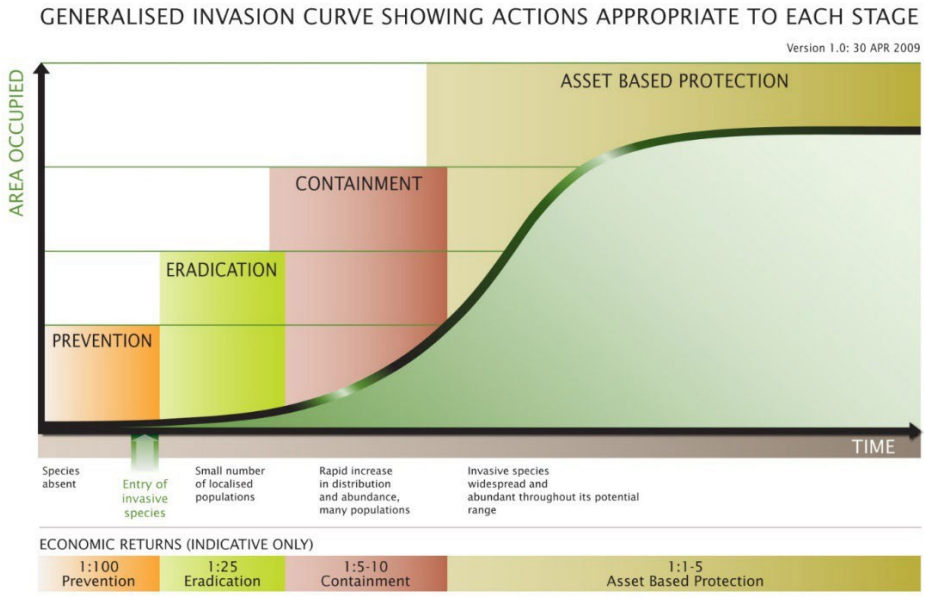

Figure 2: Diagram showing management strategies most useful during each phase of the invasion process[2]

3.2 Planning, Prevention and Best Management Practices

There are a number of factors to consider when planning invasive species management programs. When planning non-plant invasive species management programs, there are a number of resources available depending on the species, vectors of spread, and other factors. Some resources include Provincial and regional planning documents, such as *Invasive Species Strategy for BC 2024-2028*, which is a collaborative document developed with input from governments, partners, industry and others (ISCBC 2024). As well, the *Ministry of Forests Invasive Alien Species Framework for BC: Identifying and Addressing Threats to Biodiversity* (2004) and the *Canadian Columbia Basin Aquatic Invasive Species Framework* (2021) offer great resources and recommendations. There are also a number of best practice guidelines, available through Province of BC, Invasive Species Council of BC (ISCBC), and other jurisdictions. For example, there are resources and best practices available for preventing the introduction of aquatic invasive species (Province of BC) https://www2.gov.bc.ca/gov/content/environment/plants-animals-ecosystems/fish/aquatic-species/aquatic-invasives). It is important to note the distinction between Clean Drain and Dry

[2] Victoria State Government, Australia. http://www.depi.vic.gov.au/agriculture-and-food/pests-diseases-and-weeds/protecting-victoria-from-pest-animals-and-weeds

for preventing the spread of the majority of aquatic invasive species within BC, and Decontamination for preventing the spread of Zebra and Quagga mussels and Whirling Disease.

When planning invasive plant management programs, factors to consider include: the biology of the plant species, site-level considerations, proximity to species at risk and their habitats, proximity to water and wells, and goals of treatment (see Section 3.6).

Preventing the introduction and spread of invasive plants can be achieved through BMPs including:

- Minimizing soil disturbance
- Re-vegetating disturbed soil
- Using invasive plant free seed mixes
- Cleaning vehicles, clothing, equipment and machinery between sites
- Using clean (invasive plant-free) soil, gravel and fill
- Using invasive plant free hay for agriculture and restoration purposes
- Ensuring horticultural species that are planted, traded, sold and used are non-invasive
- Keeping equipment yards, storage areas and transportation corridors free of invasive plants
- Carefully disposing of invasive plant material

It is beyond the scope of this Operational Plan to outline all BMPs. Please see Appendix H for "Useful Resources" for more information.

Outreach plays a critical role in preventing the establishment and spread of invasive species and promoting best practices. For example, outreach activities can prevent invasive horticultural species from being planted or an invasive animal from being released or transported; provide the tools for a farmer to develop an invasive plant management plan; or promote invasive species reporting by a naturalist group. Although this Operational Plan does not include details of an outreach program, CSISS is aware of its importance and will continue to focus on outreach activities over the next five years ensuring that activities are consistent with the Communications Framework of the ISCBC.

3.3 Early Detection, Rapid Response (EDRR)Protocol

EDRR refers to the processes undertaken to find and eradicate a new incursion or infestation of an invasive species in the early stages of establishment when the eradication of the species is still feasible.

Provincial EDRR Process

The BC government's approach to invasive species is to find, identify, and systematically eradicate, contain or control new invasive species before they can reproduce and disperse beyond their point of entry (BC IMISWG 2014).

The BC government invasive species early detection and response activities are guided by the BC Invasive Species EDRR Plan. The EDRR plan provides detailed direction on the decisions and actions required to address new incursions anywhere in BC.

The full Invasive Species EDRR Plan for BC can be found here: https://www2.gov.bc.ca/gov/content/environment/plants-animals-ecosystems/invasive-species/edrr

The Provincial EDRR Priority Invasive Plant List can be found here: https://www2.gov.bc.ca/assets/gov/environment/plants-animals-and-ecosystems/invasive-species/guidance-resources/edrr_candidate_invasive_plants.pdf

Provincial EDRR species should be immediately reported to the province

Report to:

- Report Invasives App (Android devices)
- Report Invasives App (iPhone or iPad)
- Email: invasive.plants@gov.bc.ca

Invasive Mussel Reports should be reported directly to the BC Conservation Officer Services RAPP Hotline: 1-877-952-7277

Regional Prevent and Regional EDRR Process

Detection of regional prevent species or regional EDRR species should be reported to CSISS within 48 hours.

Regional Prevent or Regional EDRR steps include:

1. Spotter reports regional prevent or regional EDRR species sightings to CSISS within 48 hours. CSISS immediately reports sightings to the Provincial Invasive Plant/ Species Specialist and the land manager/owner/occupier, if applicable.
2. CSISS representative visits the site to confirm the identification of the species, records GPS coordinates, takes photos, and collects a voucher specimen, if possible. If the species cannot be identified, voucher specimens and photos will be submitted to Provincial identification specialists for confirmation, or a regional specialist may be contacted to visit the site (e.g. Provincial/Federal/Regional Habitat or Fisheries biologists). Information also will be shared with the Provincial Invasive Plant/Species Specialist. The affected land owner will be informed of this process immediately.
3. Once the species has been positively identified, information will be shared with the land owner, the spotter, and the Provincial Invasive Plant/Species Specialist.

4. CSISS will enter the site into InvasivesBC[3]/ appropriate invasive species database.
5. CSISS will contact the land owner to further inventory the area to determine the full extent of the species, and to develop a strategy for eradication. If possible, for invasive plant species, all root and seed material will be bagged immediately until further treatments can be conducted.
6. CSISS will issue an Alert on the species through the CSISS network (e.g., mailing lists, press releases etc.) and contact appropriate, adjacent land managers.

3.4 Inventory

Inventories and surveys[4] provide fundamental information for assessing and prioritizing invasive species management efforts. Information from inventories can be used to answer a number of questions including the full extent of a target species, whether treatments have been effective, and how quickly a species is spreading. Inventory methods for non-plant invasive species may vary depending on the species and should follow recommended provincial or scientific protocols.

CSISS promotes the use of standardized invasive plant inventory methodology and data forms based on the provincial InvasivesBC standards (MoF 2023). Further or continued inventory is required for some species to determine their full extent and to develop better management approaches. Regionally, priorities for invasive species inventory include:

- All species on Non-Plant Watchlist;
- All species under regional prevent, regional EDRR and annual control (including containment species outside containment lines); and
- All species with insufficient information.

Border areas between regional invasive species organizations/ regional district areas are high priority for annual invasive plant surveys to detect new invasive species. The following areas are a priority in the Columbia Shuswap:

Salmon Arm IPMA	• Hwy 1 between Chase and Sorrento • Hwy 97A south of Sicamous • Hwy 97B south of Salmon Arm
Revelstoke IPMA	• Hwy 23S south of Galena Bay
Golden IPMA	• Hwy 95 south of Parson • Hwy 1 east of Field

[3] InvasivesBC is British Columbia's modernized invasive species database, map and mobile data collection application that was made available in 2023.

[4] In this Plan, inventory and survey are used interchangeably. Technically, "Invasive plant surveys are observations made at a single point in time to determine the occurrence of one or many species within a defined landscape. The difference between a survey and an inventory is that 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." (MoF 2024)

Other priority sites for inventory are:

- Priority waterbodies as defined in the Provincial Invasive Mussel Field Protocol (MWLRS 2025)
- Gravel pits
- Rail lines, utility rights-of-way, and other corridors of spread
- Newly developed/disturbed areas e.g., forestry, mining, other industry areas
- Trailheads/Recreation sites/Parks with high traffic and potential source areas
- Other sites that are potential vectors of spread (e.g., area around Field Town-site adjacent to federal Parks jurisdiction)

3.5 Treatment Priorities for Invasive Plants

Treatment priority level is based on the category of the invasive species (see Appendix D, E and F) as well as the specific land management objectives. The goal of treatment is to reduce impacts and/or prevent spread.

Treatment Priority level 1: All species under regional prevent, regional EDRR and annual control: These plant species/sites should be treated or visited every year. New occurrences of annual control species should be reported to CSISS/ Report-Invasives application for entering into InvasivesBC database and contacting land owner/manager. New occurrences of regional prevent, regional EDRR and provincial EDRR species should follow EDRR reporting protocols (see section 3.3).

Treatment Priority level 2: Containment species *outside* containment lines: Isolated populations of invasive plants outside the containment lines will be treated as a higher priority than established populations within the containment lines. See invasive plant priority lists for descriptions/containment maps, if applicable.

Treatment Priority level 3: Management and/or containment species *inside* containment lines on or near sites of high value or with high potential to spread.

Invasive plant infestations of management species may also be a high priority if:

1) The infestation(s) of established invasive plants spreading onto, or adjacent to and threatening to spread onto, agricultural land or rangeland or conservation lands;
2) There are land managers in the same area as the infestation(s) who are controlling these invasive plants on their own land and are concerned about their future spread; and
3) The invasive plant is toxic to livestock/wildlife or otherwise detrimental to the agricultural or rangeland or conservation values

Treatment Methods

Treatment is recommended to follow an Integrated Pest Management approach; the six elements of Integrated Pest Management include (Ministry of Environment 2016):

1. Prevention: planning and managing systems to prevent invasive species

2. Identification: identifying invasive species, their natural enemies and damage
3. Monitoring: monitoring populations of invasive species and beneficial organisms, invasive species damage, and environmental conditions
4. Action threshold: Making control decisions based on potential damage, cost of control methods, value of production, beneficial organisms and the environment
5. Management options: Using strategies that may include a combination of behavioural, biological, chemical, cultural and mechanical methods to reduce invasive species populations
6. Evaluation: evaluating the effects and efficacy of management decisions

One or several control methods may be coordinated into an Integrated Pest Management approach to target a certain invasive species. Examples include:

- Mechanical control
- Cultural control
- Biological control
- Selective spot application of herbicides

Treatment methods are selected to ensure that an invasive plant species will receive the most effective treatment while minimizing the environmental impact, typically following the integrated pest management pyramid (Figure 3).

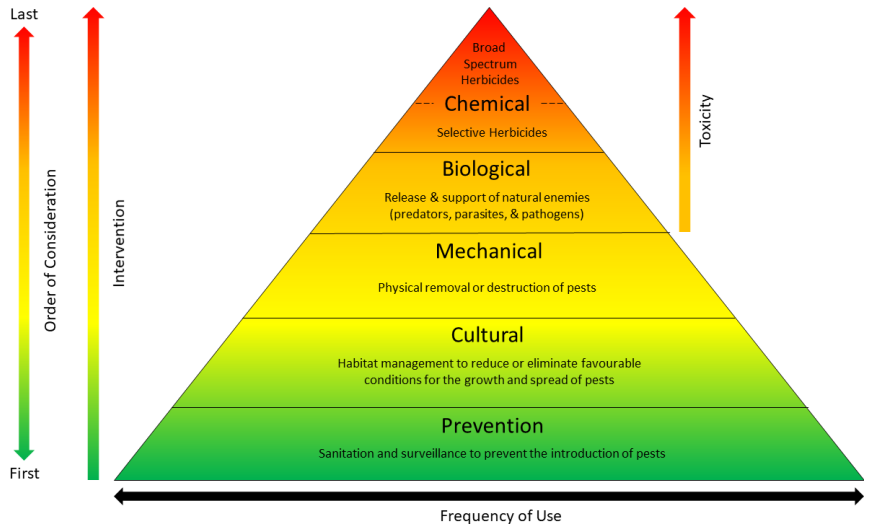

Figure 3: The integrated pest management pyramid, showing the hierarchy of treatment methods. From *Mount Revelstoke and Glacier National Parks Invasive Alien Plant Management* Plan (Parks Canada 2022).

The control method used at a particular site is determined by the land owner and/or qualified contractor, and depends on many factors:

- Location, including the remoteness of a site and proximity to riparian zones;
- Invasive plant species;
- Target species composition and percent cover;
- Stage of invasive plant life cycle (rosette vs. seed-set);
- Current and proposed land use;
- Proximity to primary biocontrol release sites[5];
- Availability of a Pest Management Plan or Pesticide Use Permit (where applicable);
- Archeological sites;
- Land status (First Nation reserves);
- Topography;
- Availability of biocontrol agents;
- Non-target vegetation impacts;
- Treatment objective (eradication, containment or control);
- Seasonality;
- Weather conditions;
- Financial and human resources;
- Species at risk in area[6]; and
- Wells and waterbodies in area.

NOTE: It is important to hire a qualified contractor and to conduct all treatments in compliance with applicable legislation.

Treatment Timing

The ideal treatment recommendation (when funding is sufficient and an integrated pest management approach is implemented) is a three or more-pass system as outlined below;

1. First Pass: Treatment occurs on known sites when plants are at the rosette stage.
2. Second Pass: Treatment occurs when plants have bolted and a few are about to bloom.
3. Third Pass: Treatment objective is to prevent any missed plants from treatments 1 and 2 from producing viable seed.

[5] Contact Invasive Plant Specialist (MoF)

[6] Contact Conservation Data Centre (CDC) and MoF

When resources are limited, the ideal minimal treatment approach is a two-pass system:

1. First Pass: Treatment has been delayed until most plants are at the bolt stage and a few are ready to bloom.
2. Second Pass: Treatment objective is to prevent any missed plants from producing viable seed.

MECHANICAL TREATMENT DISPOSAL METHODS:

The CSRD now offers FREE disposal of 'household amounts' of invasive plant material. Invasive plants will need to be bagged and brought to the landfill for disposal in the household waste section, not the yard waste section, speak to the landfill attendant for more information.

Large amounts of invasive plant material, to be disposed of at the landfill, will need to be pre-arranged. A controlled waste application must be filled out for approval and deep burial charges will apply. Contact the CSRD for more information.

3.6 ENFORCEMENT

Under the Wildlife Act, the Controlled Alien Species Regulation controls the possession, breeding, shipping and releasing of alien animals that pose a risk to the health or safety of people, property, wildlife or wildlife habitat. The B.C. government has the authority to designate certain animals as controlled alien species in order to regulate them. Provincial conservation officers and constables of the B.C. Conservation Officer Service have the authority to seize or destroy controlled alien species.

Any controlled alien species should be reported directly to the BC Conservation Officer Services RAPP Hotline: 1-877-952-7277.

Under bylaw 5110, the CSRD has the ability to enforce the *BC Weed Control Act,* including the management of species listed under the Act.

Noxious weed protocol steps include:

1. When a noxious weed species is suspected, a CSISS representative visits site to confirm the identification of the species, records GPS coordinates and takes photos. Under no circumstances shall CSISS staff trespass on private property. To verify a report, CSISS staff may approach the property in question from the highway or municipal right of way and document their findings.
2. CSISS will enter the site into InvasivesBC.
3. Once noxious weeds are confirmed, information will be shared with the CSRD and landowner contact information will be provided to CSISS.
4. CSISS will deliver (in-person or mail) a landowner extension letter stating noxious weed species found, growth stage, size of infestation, location on property and best management practices for treatment. CSISS will encourage the landowner to treat the

infestation within 30 days of receiving the notice and inform them that a follow-up survey will be conducted after the same 30-day period.

5. CSISS will conduct a post 30-day follow-up survey. If no action has been taken by the landowner, CSISS will work with the CSRD Noxious Weed Enforcement Officer to deliver, via registered mail, a formal noxious weed notification letter. The letter will state, a record will be kept of the infestation and the property will be re-inspected for compliance 30 days after the post date of the letter.
6. If no reasonable action is taken by the landowner, the CSRD Noxious Weed Enforcement Officer can enact Bylaw 5110 and enforce the BC Weed Control Act.

3.7 Efficacy Monitoring Recommendations

The effectiveness of treatment depends on many factors including time of year, type of treatment, climate conditions, geographic location, and number of passes. Monitoring treatment efficacy contributes to a better understanding of which treatments are most effective and allows for adaptive management within and between seasons. In association with InvasivesBC, there are standardized forms for monitoring chemical, mechanical and biocontrol treatment efficacy[7]. Entering this data into InvasivesBC allows land managers to easily share this information and assists with long term planning and management. Monitoring methods for non-plant invasive species may vary depending on the species and should follow recommended provincial or scientific protocols and guidance from Provincial specialists.

The Ministry of Forests requires that a minimum of 10% of treatment sites be monitored for efficacy and contractor diligence (MoF 2024) and this target has generally become the standard for BC. Sites may either be chosen at random or selected based on treatment priority. Mechanically or chemically treated sites are monitored during the same field season while biological treatment sites are monitored the following year to determine establishment success of bioagents.

Where possible, land owners and occupiers are encouraged to:

- Monitor 10% of all treated sites, 2-6 weeks after treatment as appropriate and/or the following spring as appropriate;
- Use InvasivesBC Monitoring Forms;
- Enter monitoring data into InvasivesBC;
- Take monitoring photographs from the same location, aspect and viewpoint as in previous years;
- Monitor for at least 3 more years (depending on species longevity in the seed bank), following a season where 0 m^2 of the plant is observed; and
- See Provincial monitoring guidelines for species specific monitoring guidelines

[7] InvasivesBC Application and standardized forms: https://www2.gov.bc.ca/gov/content/environment/plants-animals-ecosystems/invasive-species/invasivesbc/invasivesbc-resources#field-forms

3.8 Record-keeping and Data Management

Sharing invasive plant inventory, treatment and monitoring data facilitates a collaborative and long-term approach to management. Entry of this information into the InvasivesBC database allows land managers to determine which species are on or near their jurisdiction, what activities have occurred, and the efficacy of completed treatments. Where possible, *all* data will be entered into the InvasivesBC database. Where this is not feasible, agencies are strongly encouraged to enter the following minimum critical data, in order of priority:

1. Immediately report and then enter regional prevent and regional EDRR species;
2. Enter annual control species and containment species *outside* containment lines;
3. Enter insufficient information species; then
4. Enter containment species *inside* containment lines and management species.

Provincial government, in partnership with regional organizations, can provide courses on InvasivesBC data entry. The invasive animal database housed within InvasivesBC is currently in development.

4.0 Evaluating Success

Tracking progress is a key element of the success of this framework and of invasive species management activities in general. Recommendations for monitoring progress include:

1. Assess species priorities annually and update the priority plant and non-plant lists (Appendix B, C, D, E, F and G).
2. Measure success of eradication and containment of integrated pest management efforts annually (e.g., before and after photos and/or plot counts).
3. Evaluate education and outreach activities (as preventative measures) annually.
4. Review inventory requirements and gaps every five years.
5. Summarize data management activities and requirements annually.
6. Measure the degree of engagement of land managers, community groups, and the public annually and identify gaps.
7. Solicit input annually from all stakeholders to share successes, publish results, update priorities and coordinate activities.

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APPENDIX A: DEFINITION OF PRIORITY RANKING FOR REGIONAL INVASIVE PLANTS

REGIONAL DEFINITIONS	
Prevent 0	High priority species not currently known in the IPMA and/ or within the region. Management objective is to prevent the introduction and establishment.
Regional EDRR 1	High priority species extremely limited in extent (less than 10 very small sites) within the Columbia Shuswap Regional District boundary. Management objective is eradication.
Annual Control 2	Species with limited extent and/ or significant potential to spread. Management objective is to prevent further expansion into new areas with the ultimate goal of reducing the overall extent.
Containment 3	Species is established or with high potential for spread. Management objective is to prevent further expansion into new areas within the region through establishment of containment lines and identification of occurrences outside the line to control.
Management 4	Species is more widespread but may be of concern in specific situations with certain high values - e.g., conservation lands, specific agriculture crops. Management objective is to reduce the invasive species impacts locally or regionally, where resources are available.
Insufficient information 5	Species have insufficient information on their distribution, impacts, potential for spread and/or feasibility of control. Further information is required.

APPENDIX B: REGIONAL PRIORITY INVASIVE PLANTS IN THE COLUMBIA SHUSWAP BY IPMA

Species	Bio-control?	Relevant legislation[1]	Salmon Arm IPMA	Revelstoke IPMA	Golden IPMA
Baby's breath (*Gypsophila paniculata*)		CCSCJ, FRPA	2	2	2
Bachelor's button (*Centaurea cyanus*)			5	5	5
Black henbane (*Hyoscyamus niger*)			0	0	1
Bighead knapweed (*Centaurea macrocephala*)			0	0	0
Black knapweed (*Centaurea nigra*)	Y	FRPA	2	2	0
Black locust (*Robinia pseudoacacia*)			5	5	5
Blueweed (*Echium vulgare*)		WCA, CCSCJ, FRPA	2	2	2
Bohemian knotweed (Reynoutria / Fallopia x bohemica)		WCA	2	2	2
Brown Knapweed (*Centaurea jacea*)		FRPA	2	2	0
Buffalobur (*Solanum rostratum*)			0	0	0
Bull thistle (*Cirsium vulgare*)	Y	CCSCJ, FRPA	4	4	4
Bur chervil (*Anthriscus caucalis*)		WCA	0	0	0
Burdock (*Arctium spp.*)		WCA, CCSCJ, FRPA	4	4	4
Canada thistle (*Cirsium arvense*)	Y	WCA, CCSCJ, FRPA	4	4	4
Caraway (*Carum carvi*)			4	4	4
Carpet burweed (*Soliva sessilis*)		CCSCJ	5	5	5
Cheatgrass / downy brome (*Bromus tectorum*)		CCSCJ	4	4	4
Chicory (*Cichorium intybus*)			4	4	4
Coltsfoot (*Tussilago farfara*)			5	0	0
Common bugloss (*Anchusa officinalis*)			1	0	1
Common comfrey (*Symphytum officinale*)			4	4	4
Common tansy (*Tanacetum vulgare*)		WCA, CCSCJ, FRPA	3	3	2
Contain to gardens: - Butterfly bush (*Buddleja davidii*) - Common periwinkle (*Vinca minor*) - English holly (*Ilex aquifolium*) - English ivy (*Hedera helix*) - Garden yellow loosestrife (*Lysimachia vulgaris*)		CCSCJ (English ivy, Salt cedar)	3	3	3

- Goutweed (*Aegopodium podagraria*) - Mountain bluet (*Aegopodium podagraria*) - Myrtle spurge (*Euphorbia myrsinites*) - Russian olive (*Elaeagnus angustifolia*) - Salt cedar/ Tamarisk (*Tamarix ramosissima*) - Siberian elm (*Ulmus pumila*)					
Creeping buttercup (*Ranunculus repens*)			5	5	5
Curly leaf pondweed (*Potamogeton crispus*)		CCSCJ	5	5	5
Cypress spurge (*Euphorbia cyparissias*)			1	1	1
Dalmatian toadflax (*Linaria genistifolia spp. dalmatica*)	Y	WCA, CCSCJ, FRPA	4	4	4
Dame's rocket (*Hesperis matronalis*)			5	5	5
Diffuse knapweed (*Centaurea diffusa*)	Y	WCA, CCSCJ, FRPA	4	4	2
Eurasian Water Milfoil (*Myriophyllum spicatum*)		CCSCJ	3	3	5
Eyebright (*Euphrasia nemorosa*)			5	5	5
Field bindweed (*Convolvulus arvensis*)			5	5	5
Field scabious (*Knautia arvensis*)		FRPA	1	0	0
Flat Peavine (*Lathyrus sylvestris*)			5	5	5
Fragrant water lily (*Nymphaea odorata subsp. odorata*)			3	5	5
Garlic mustard (*Alliaria petiolata*)		WCA, CCSCJ	0	1	0
Giant hogweed (*Heracleum mantegazzianum*)		WCA, CCSCJ	1	0	0
Giant knotweed (*Reynoutria / Fallopia sachalinensis*)		WCA,CCSCJ, FRPA	0	1	0
Gorse (*Ulex europaeus*)		WCA, CCSCJ, FRPA	0	0	0
Greater celandine (*Chelidonium majus*)			5	5	5
Greater knapweed (*Centaurea scabiosa*)			0	0	0
Green foxtail / green bristlegrass (*Setaria viridis*)			5	5	5
Himalayan blackberry (*Rubus armeniacus*)		CCSCJ	2	2	0
Himalayan knotweed (*Persicaria wallichii / Polygonum polystachyum*)		WCA	0	0	0
Hoary alyssum (*Berteroa incana*)		FRPA	4	2	2
Hoary cress (*Lepidium / Cardaria draba*)		WCA, CCSCJ, FRPA	1	0	1

Hound's tongue (*Cynoglossum officinale*)	Y	WCA, CCSCJ, FRPA	4	4	4
Japanese butterbur (*Petasites japonicus*)			1	0	0
Japanese knotweed (*Reynoutria / Fallopia japonica*)		WCA, CCSCJ, FRPA	2	2	2
Jewelweed (*Impatiens capensis)*			5	5	5
Jimsonweed (*Datura stramonium)*			5	5	5
Kochia (*Bassia / Kochia scoparia*)			5	5	5
Lady's thumb (*Persicaria maculosa / Polygonum persicaria*)			5	5	5
Leafy spurge (*Euphorbia esula*)	Y	WCA, CCSCJ, FRPA	2	2	2
Longspine sandbur (*Cenchrus longispinus*)			0	0	0
Marsh plume thistle (*Cirsium palustre*)		FRPA	3	2	0
Meadow buttercup (*Ranunculus acris*)			4	4	4
Meadow goat's beard (*Tragopogon pratensis*)			4	4	5
Meadow knapweed (*Centaurea x moncktonii / debeauxii*)	Y	WCA, CCSCJ, FRPA	4	4	2
Nightshade (*Solanum dulcamara*)			4	5	5
Nodding thistle (*Carduus nutans*)	Y	CCSCJ, FRPA	0	0	0
North Africa grass (*Ventenata dubia*)			0	0	0
Orange hawkweed (*Pilosella aurantiaca)*		WCA, CCSCJ, FRPA	4	4	4
Oxeye daisy (*Leucanthemum vulgare*)		FRPA	4	4	4
Plumeless thistle (*Carduus acanthoides*)	Y	FRPA	0	0	0
Poison hemlock (*Conium maculatum*)		CCSCJ	2	2	2
Policeman's helmet (*Impatiens glandulifera*)		CCSCJ	2	2	2
Puncturevine (*Tribulus terrestris*)		FRPA	0	0	0
Purple loosestrife (*Lythrum salicaria*)	Y	WCA, CCSCJ, FRPA	4	4	4
Queen anne's lace / wild carrot (*Daucus carota*)			4	5	5
Rush skeletonweed (*Chondrilla juncea*)	Y	WCA, CCSCJ, FRPA	2	0	0
Russian knapweed (*Rhaponticum / Acroptilon repens*)		FRPA	1	0	0
Russian thistle (*Salsola tragus / kali*)			5	5	5

Scentless chamomile (*Tripleurospermum inodorum / Matricaria perforata*)	Y	WCA, CCSCJ, FRPA	5	5	2
Scotch broom (*Cytisus scoparius*)		CCSCJ, FRPA	2	2	0
Scotch thistle (*Onopordum acanthium*)		FRPA	2	0	0
Short-fringed knapweed (*Centaurea nigrescens*)	Y		1	0	1
Spotted knapweed (*Centaurea stoebe / biebersteinii*)	Y	WCA, CCSCJ, FRPA	4	4	3
Spurge laurel (*Daphne laureola*)		CCSCJ	0	0	0
St. John's wort (*Hypericum perforatum*)	Y	CCSCJ, FRPA	4	4	4
Sulphur cinquefoil (*Potentilla recta*)		WCA, CCSCJ, FRPA	4	4	5
Sweet fennel (*Foeniculum vulgare*)			5	5	5
Tansy ragwort (*Jacobaea vulgaris / Senecio jacobaea*)	Y	WCA, CCSCJ, FRPA	0	0	0
Teasel (*Dipsacus fullonum*)		FRPA	2	2	0
Tree of heaven (*Ailanthus altissima*)			1	0	0
Western Goat's Beard (*Tragopogon dubius*)			4	4	4
Wild chervil (*Anthriscus sylvestris*)			1	1	0
Wild four o'clock (*Mirabilis nyctaginea*)			5	5	5
Wild parsnip (*Pastinaca sativa*)			1	1	1
Woolly vetch (*Vicia villosa*)			5	5	5
Wood sage (*Salvia nemorosa*)			0	0	0
Wormwood (*Artemisia absinthium*)			4	4	4
Yellow archangel (*Lamiastrum galeobdolon*)			2	2	0
Yellow flag iris (*Iris pseudacorus*)		WCA, CCSCJ, FRPA	2	0	0
Yellow hawkweed spp. (*Pilosella spp.*) (including: king devil, meadow, polar, queen devil, spotted, tall, whiplash, yellow devil)		FRPA (meadow)	4	4	4
Yellow toadflax (*Linaria vulgaris*)	Y	WCA, CCSCJ, FRPA	4	4	4

[1] WCA= Weed Control Act; CCSCJ= Community Charter- Spheres of Concurrent Jurisdiction, Environment and Wildlife Regulation; FRPA=Forest and Range Practices Act- Invasive Plants Regulation

APPENDIX C: UNLISTED LOWER PRIORITY SPECIES FOR COLUMBIA SHUSWAP

UNLISTED Lowest Priority in all IPMAs (therefore not included in ranking, some jurisdictions may choose to control - consider as priority 4)		
Species Name	Rank	IPMA
Annual hawksbeard (CREP TEC)	6	All
Annual sow thistle (SONC OLE)	6	All
Bladder campion (SILE VUL)	6	All
Cudweed (GNAP ULI)	6	All
Curled dock (RUME CRI)	6	All
Groundsel (SENE VUL)	6	All
Hairy cat's ear (HYPO RAD)	6	All
Hedge false bindweed (CALY SEP)	6	All
Mullein (VERB THA)	6	All
Night-flowering catchfly (SILE NOC)	6	All
Perennial sow thistle (SONC ARV)	6	All
Sheep sorrel (RUME ACE)	6	All
Shepherd's purse (CAPS BUR)	6	All
Watercress (NAST OFF)	6	All
White cockle (LYCH ALB)	6	All
Wild buckwheat (POLY CON)	6	All

APPENDIX D: SALMON ARM PRIORITY PLANT LIST

PREVENT – High priority species not currently known in the IPMA and/ or within the region. Management objective is to prevent the introduction and establishment. **Bolded species indicate Provincial EDRR**		
- Bighead knapweed - Black henbane - Buffalobur - Bur chervil - Garlic mustard - Giant knotweed	- Gorse - Greater knapweed - Himalayan knotweed - Longspine sandbur - Nodding thistle - North Africa grass	- Plumeless thistle - Puncturevine - Spurge laurel - Tansy ragwort - Wood sage
REGIONAL EDRR – High priority species extremely limited in extent (less than 10 very small sites) within the Columbia Shuswap Regional District boundary. Management objective is eradication.		
- Common bugloss - Cypress spurge - Field scabious - Giant hogweed	- Hoary cress - Japanese butterbur - Russian knapweed - Short-fringed knapweed	- Tree of heaven - Wild chervil - Wild parsnip
ANNUAL CONTROL – Species with limited extent and/ or significant potential to spread. Management objective is to prevent further expansion into new areas with the ultimate goal of reducing the overall extent.		
- Baby's breath - Black knapweed (BC) - Blueweed - Bohemian knotweed - Brown knapweed - Himalayan blackberry	- Japanese knotweed - Leafy spurge (BC) - Poison hemlock - Policeman's helmet - Rush skeletonweed (BC)	- Scotch broom - Scotch thistle - Teasel - Yellow archangel - Yellow flag iris
CONTAINMENT – Species is established or with high potential for spread. Management objective is to prevent further expansion into new areas within the region through establishment of containment lines and identification of occurrences outside the line to control.		
Contain to gardens: - Butterfly bush - Common periwinkle - English holly - English ivy - Garden yellow loosestrife - Goutweed - Mountain bluet - Myrtle spurge	**Contain to gardens Cont'd:** - Russian olive - Salt cedar/ Tamarisk - Siberian elm **Contain to White Lake:** - Fragrant water lily **Contain to Crazy Creek RR:** - Marsh plume thistle	**Contain to west portion of IPMA (treat Seymour Arm and east portion of IPMA):** - Common tansy **Contain to Shuswap/ Mara/White Lake:** - Eurasian water milfoil
MANAGEMENT – Species is more widespread but may be of concern in specific situations with certain high values - e.g., conservation lands, specific agriculture crops. Management objective is to reduce the invasive species impacts locally or regionally, where resources are available.		
- Bull thistle (BC) - Burdock - Canada thistle (BC) - Caraway - Cheatgrass/downy brome - Chicory - Common comfrey - Dalmatian toadflax (BC) - Diffuse knapweed (BC)	- Hoary alyssum - Hound's tongue (BC) - Meadow buttercup - Meadow goat's beard - Meadow knapweed (BC) - Nightshade - Orange hawkweed - Oxeye daisy - Purple loosestrife (BC)	- Queen Anne's Lace - Spotted knapweed (BC) - St. John's Wort (BC) - Sulphur cinquefoil - Western goat's beard - Wormwood - Yellow hawkweed spp. - Yellow toadflax (BC)
INSUFFICIENT INFORMATION – Species have insufficient information on their distribution, impacts, potential for spread and/or feasibility of control. Further information is required.		
- Bachelor's button - Black locust - Carpet burweed - Coltsfoot - Creeping buttercup - Curly leaf pondweed - Dame's rocket	- Eyebright - Field bindweed - Flat peavine - Greater celandine - Green foxtail - Kochia	- Lady's thumb - Russian thistle - Scentless chamomile (BC) - Sweet fennel - Wild four o'clock - Woolly vetch

BC – biocontrol

APPENDIX E: REVELSTOKE IPMA PRIORITY PLANT LIST

PREVENT – High priority species not currently known in the IPMA and/ or within the region. Management objective is to prevent the introduction and establishment. **Bolded species indicate Provincial EDRR**		
- Bighead knapweed - Black henbane - Buffalobur - Bur chervil - Coltsfoot - Common bugloss - Field scabious - Giant hogweed - Gorse	- Greater knapweed - Himalayan knotweed - Hoary cress - Japanese butterbur - Longspine sandbur - Nodding thistle - North Africa grass - Plumeless thistle - Puncturevine	- Rush skeletonweed (BC) - Russian knapweed - Scotch thistle - Short-fringed knapweed - Spurge laurel - Tansy ragwort - Tree of heaven - Wood sage - Yellow flag iris
REGIONAL EDRR – High priority species extremely limited in extent (less than 10 very small sites) within the Columbia Shuswap Regional District boundary. Management objective is eradication.		
- Cypress spurge - Garlic mustard	- Giant knotweed - Wild chervil	- Wild parsnip
ANNUAL CONTROL – Species with limited extent and/ or significant potential to spread. Management objective is to prevent further expansion into new areas with the ultimate goal of reducing the overall extent.		
- Baby's breath - Black knapweed (BC) - Blueweed - Bohemian knotweed - Brown knapweed	- Himalayan blackberry - Hoary alyssum - Japanese knotweed - Leafy spurge (BC) - Marsh plume thistle	- Poison hemlock - Policeman's helmet - Scotch broom - Teasel - Yellow archangel
CONTAINMENT – Species is established or with high potential for spread. Management objective is to prevent further expansion into new areas within the region through establishment of containment lines and identification of occurrences outside the line to control.		
Contain to gardens: - Butterfly bush - Common periwinkle - English holly - English ivy - Garden yellow loosestrife	- Goutweed - Mountain bluet - Myrtle spurge - Russian olive - Salt cedar/ Tamarisk - Siberian elm	**Contain to southern portion of IPMA:** - Common tansy **Contain to Revelstoke and Arrow Reservoirs:** - Eurasian water milfoil
MANAGEMENT – Species is more widespread but may be of concern in specific situations with certain high values - e.g., conservation lands, specific agriculture crops. Management objective is to reduce the invasive species impacts locally or regionally, where resources are available.		
- Bull thistle (BC) - Burdock - Canada thistle (BC) - Caraway - Cheatgrass/downy brome - Chicory - Common comfrey - Dalmatian toadflax (BC)	- Diffuse knapweed (BC) - Hound's tongue (BC) - Meadow buttercup - Meadow goat's beard - Meadow knapweed (BC) - Orange hawkweed - Oxeye daisy - Purple loosestrife (BC)	- Spotted knapweed (BC) - St. John's Wort (BC) - Sulphur cinquefoil - Western goat's beard - Wormwood - Yellow hawkweed spp. - Yellow toadflax (BC)
INSUFFICIENT INFORMATION – Species have insufficient information on their distribution, impacts, potential for spread and/or feasibility of control. Further information is required.		
- Bachelor's button - Black locust - Carpet burweed - Creeping buttercup - Curly leaf pondweed - Dame's rocket - Eyebright - Field bindweed	- Flat peavine - Fragrant water lily - Greater celandine - Green foxtail - Jewelweed - Jimsonweed - Kochia - Lady's thumb	- Nightshade - Queen Anne's Lace - Russian thistle - Scentless chamomile (BC) - Sweet fennel - Wild four o'clock - Woolly vetch

BC – biocontrol

APPENDIX F: GOLDEN IPMA PRIORITY PLANT LIST

PREVENT – High priority species not currently known in the IPMA and/ or within the region. Management objective is to prevent the introduction and establishment. **Bolded species indicate Provincial EDRR**		
- Bighead knapweed - Black knapweed (BC) - Brown knapweed - Buffalobur - Bur chervil - Coltsfoot - Field scabious - Garlic mustard - Giant hogweed - Giant knotweed - Gorse	- Greater knapweed - Himalayan blackberry - Himalayan knotweed - Japanese butterbur - Longspine sandbur - Marsh plume thistle - Nodding thistle - North Africa grass - Plumeless thistle - Puncturevine - Rush skeletonweed (BC)	- Russian knapweed - Scotch broom - Scotch thistle - Spurge laurel - Tansy ragwort - Teasel - Tree of heaven - Wild chervil - Wood sage - Yellow archangel - Yellow flag iris
REGIONAL EDRR – High priority species extremely limited in extent (less than 10 very small sites) within the Columbia Shuswap Regional District boundary. Management objective is eradication.		
- Black henbane - Common bugloss	- Cypress spurge - Hoary cress	- Short-fringed knapweed - Wild parsnip
ANNUAL CONTROL – Species with limited extent and/ or significant potential to spread. Management objective is to prevent further expansion into new areas with the ultimate goal of reducing the overall extent.		
- Baby's breath - Blueweed - Bohemian knotweed - Common Tansy	- Diffuse knapweed (BC) - Hoary alyssum - Japanese knotweed - Leafy spurge (BC)	- Meadow knapweed (BC) - Poison hemlock - Policeman's helmet - Scentless chamomile (BC)
CONTAINMENT – Species is established or with high potential for spread. Management objective is to prevent further expansion into new areas within the region through establishment of containment lines and identification of occurrences outside the line to control.		
Contain to gardens: - Butterfly bush - Common periwinkle - English holly - English ivy - Garden yellow loosestrife	- Goutweed - Mountain bluet - Myrtle spurge - Russian olive - Salt cedar/ Tamarisk - Siberian elm	**Contain to northern portion of IPMA - treat south of containment line:** - Spotted knapweed (BC)
MANAGEMENT – Species is more widespread but may be of concern in specific situations with certain high values - e.g., conservation lands, specific agriculture crops. Management objective is to reduce the invasive species impacts locally or regionally, where resources are available.		
- Bull thistle (BC) - Burdock - Canada thistle (BC) - Caraway - Cheatgrass/downy brome - Chicory	- Common comfrey - Dalmatian toadflax (BC) - Hound's tongue (BC) - Meadow buttercup - Orange Hawkweed - Oxeye daisy	- Purple loosestrife (BC) - St. John's Wort (BC) - Western goat's beard - Wormwood - Yellow hawkweed spp. - Yellow toadflax (BC)
INSUFFICIENT INFORMATION – Species have insufficient information on their distribution, impacts, potential for spread and/or feasibility of control. Further information is required.		
- Bachelor's button - Black locust - Carpet burweed - Creeping buttercup - Curly leaf pondweed - Dame's rocket - Eurasian water milfoil - Eyebright - Field bindweed	- Flat peavine - Fragrant water lily - Greater celandine - Green foxtail - Jewelweed - Jimsonweed - Kochia - Lady's thumb	- Meadow goat's beard - Nightshade - Queen Anne's Lace - Russian thistle - Sulphur cinquefoil - Sweet fennel - Wild four o'clock - Woolly vetch

BC – biocontrol

APPENDIX G: COLUMBIA SHUSWAP REGIONAL INVASIVE SPECIES WATCHLIST

PROVINCIAL DEFINITIONS *Updated: January 2026*		
Prevent	1	Species determined to be high risk to BC and not yet established. **Management objective** is to prevent the introduction and establishment.
Provincial EDRR	2	Species is high risk to BC and is new to the Province. **Management objective** is eradication.
Provincial Containment	3	Species is high risk with limited extent in BC but significant potential to spread. **Management objective** is to prevent further expansion into new areas with the ultimate goal of reducing the overall extent.
Regional Containment/Control	4	Species is high risk and well established, or medium risk with high potential for spread. **Management objective** is to prevent further expansion into new areas within the region through establishment of containment lines and identification of occurrences outside the line to control.
Management	5	Species is more widespread but may be of concern in specific situations with certain high values - e.g., conservation lands, specific agriculture crops**. Management objective** is to reduce the invasive species impacts locally or regionally, where resources are available.
Not listed	6	Species not listed by the Province, but presence/absence data collected for Columbia Shuswap region.

Note: the purpose of this watch-list is to improve awareness and reporting in the Columbia Shuswap region. For priority ranking, risk assessments and management tools for invasive species, the Province of BC is the authority. To report invasive species, go to: www.reportinvasives.ca

Amphibians	**Priority**	***Genus***	***Species***	**Present in CSRD?**	**Known Location(s)**
African Clawed Frog	1	*Xenopus*	*laevis*	No	US: Washington
American bullfrog	4	*Lithobates*	*catesbeianus*	Absent	BC: Creston Valley, Nelway, Lower Mainland to Sunshine Coast, Vancouver Island and some Gulf Islands USA: Washington and Idaho
Green frog	4	*Lithobates*	*clamitans*	Absent	BC: Lower Mainland, Southern Vancouver Island
Birds	**Priority**	***Genus***	***Species***	**Present in CSRD?**	**Known Location(s)**
American black duck	5	*Anas*	*rubripes*	Unknown	BC: Southern Vancouver Island
Eurasian collared dove	5	*Streptopelia*	*decaocto*	Present	CSRD
European house sparrow	5	*Passer*	*domesticus*	Present	CSRD
European starling	5	*Sturnus*	*vulgaris*	Present	CSRD
Mute swan	5	*Cygnus*	*olor*	Unknown	BC: Southern Vancouver Island, Vancouver
Rock pigeon	5	*Columba*	*livia*	Present	CSRD: Salmon Arm (iNaturalist observation)
Wild turkey	5	*Meleagris*	*gallopavo*	Unknown	BC: Grindrod (iNaturalist observation)
California Quail	6	*Callipepla*	*californica*	Present	CSRD: Shuswap region
Chukar partridge	6	*Alectoris*	*chukar*	Unknown	BC: South Okanagan, Kamloops

Disease	Priority	*Genus*	*Species*	Present in CSRD?	Known Location(s)
Chytrid fungus	1	*Batrachochytrium*	*dendrobatidis*	Present	Found widespread across BC
Ranavirus	1	*Ranavirus*	*spp.*	Absent	Confirmed in northern BC in 2022
Snake fungal disease	1	*Ophidiomyces*	*ophidicola*	Absent	
White-nose syndrome	2	*Pseudogymnoascus*	*destructans*	Unknown	BC: P.D. (fungus that causes WNS) found in guano in Grand Forks in 2022. No detections in 2023 or 2024. No WNS positive bats to date. Canada: Alberta US: Washington
Dutch Elm Disease	2	*Ophiostoma*	*ulmi and novo-ulmi*	Unknown	BC: Rossland, Trail and Warfield
Whirling disease	4	*Myxobolus*	*cerebralis*	Present	BC: Kootenay Lake, Emerald Lake, Emerald River, Kicking Horse River, Wapta Lake, Finn Creek, Monarch Creek. AB: Lake Louise, BNP, Southern Alberta including Bow, Old Man, Spray, Red Deer, North Saskatchewan and Crowsnest Rivers
Bovine tuberculosis	6	*Mycobacterium*	*bovis*	Unknown	AB: Wood Buffalo National Park MB: Riding Mountain National Park
Chronic wasting disease	6	Abnormal protein called a Prion		Absent	BC: Kootenay Region as of 2024. Concern in the Peace region but not confirmed.
Fish	**Priority**	***Genus***	***Species***	**Present in CSRD?**	**Known Location(s)**
American Shad	1	*Alosa*	*sapidissima*	Present	CSRD: Williamson Lake
Amur goby	1	*Rhinogobius*	*brunneus*	Absent	
Bighead carp (Asian)	1	*Hypophthalmichthys*	*nobilis*	Absent	
Bitterling	1	*Rhodeus*	*species*	Absent	
Black carp (Asian)	1	*Mylopharyngodon*	*piceus*	Absent	
Channel catfish	1	*Ictalurus*	*punctatus*	Absent	
Grass carp (Asian)	1	*Ctenopharyngodon*	*idella*	Absent	
Monkey goby	1	*Neogobius*	*fluviatilis*	Absent	
Muskellunge	1	*Esox*	*masquinongy*	Absent	
Prussian carp	1	*Carassius*	*carassius*	Absent	AB and SK.
Rock bass	1	*Ambloplites*	*rupestris*	Absent	
Round goby	1	*Neogobius*	*melanostomus*	Absent	
Silver carp (Asian)	1	*Hypophthalmichthys*	*molitrix*	Absent	
Snakehead (Northern, Blotched, Rainbow, Giant and Chevron)	1	*Channa*	*argus, bleheri, maculata, micropeltes and striata*	Absent	BC: Northern snakehead eradicated from Burnaby Lake (2012)
Spottail shiner	1	*Notropis*	*hudsonius*	Absent	Note: Native to Peace River region
Tubenose goby	1	*Proterorhinus*	*semilunaris*	Absent	
Tui chub	1	*Gila*	*bicolor*	Absent	

Warmouth	1	*Lepomis*	*gulosus*	Absent	
White cloud mountain minnow	1	*Tanichthys*	*albonubes*	Absent	BC: Lower Mainland 2023. Found being sold in pet stores, CO's responded.
White crappie	1	*Pomoxis*	*annularis*	Absent	BC: Lower Mainland
Green sunfish	2	*Lepomis*	*cyanellus*	Absent	BC: Confirmed 2025 Skaha Pond
Rosy red minnow (Fathead minnow)	2	*Pimephales*	*promelas*	Absent	BC: Northeast (Two Island Lake near Tupper, south of Dawson Creek), near Quesnel and Prince George, Kelowna, Fraser valley, Metro Vancouver and on Vancouver Island (near Duncan).
Western mosquitofish	2	*Gambusia*	*affinis*	Absent	BC: Fishtrap Creek (Abbotsford, 2023), Grafton Lake (Bowen Island, 2023), and Sardis Park (Chiliwack -iNaturalist, 2024). AB: Banff National Park (Banff Hot Springs)
Goldfish	4	*Carassius*	*auratus*	Present	CSRD: White Lake, Shuswap Lake, Canoe Pond (70th Ave Canoe), McGuire Lake (Salmon Arm)
Northern Pike	4	*Esox*	*lucius*	Absent	iMap BC shows at Pearson Crossing Columbia Wetlands: this is an incorrect GPS location. Northern pike have also been confirmed a few times in Koocanusa Reservoir during Montana State gill net assessments and I have confirmed northern pike caught on two occasions in the mainstem upper Kootenay River near Canal Flats and again in the lower St. Mary River (upper Kootenay River tributary) near the St. Eugene Mission. Those are the only confirmed catch records. (Source: Fish Biologist Kootenay region via Khaylish Fraser)
Oriental weather loach	4	*Misgurnus*	*anguillicaudatus*	Absent	BC: Lower Fraser valley and Lower Mainland
Yellow perch	4	*Perca*	*flavescens*	Present	CSRD: Upper Arrow Lake, Williamson Lake, Pinaus Lake, Little Pinaus Lake, Square Lake, Cedar Creek; Reported in Forest lake which drains into Adams Lake (Brennan Lund, ALIB).
Black crappie	5	*Pomoxis*	*nigromaculatus*	Absent	BC: Lower Fraser valley, South Okanagan valley, Trail
Bluegill sunfish	5	*Lepomis*	*macrochirus*	Absent	BC: South Okanagan
Largemouth bass	5	*Micropterus*	*salmoides*	Absent	BC: Lower Fraser valley, South Okanagan, Creston, Lower Kootenay River. CSRD: Reported from Horse Crk/Mulligans Slough South of Golden
Bullhead (Yellow, Black, Brown)	5	*Ameiurus*	*natalis, melas, nebulosus*	Absent	*melas* - BC: Okanagan, Kootenay River near Creston
Common carp	5	*Cyprinus*	*carpio*	Present	CSRD: Shuswap Lake, Upper Arrow Lake, Canoe Pond (70th Ave Canoe), Larch Hills Lake RDNO: Shuswap River (Enderby)
Pumpkinseed sunfish	5	*Lepomis*	*gibbosus*	Absent	CSRD: rotenone treatment in Skimikin Lake
Largemouth bass	5	Micropterus	salmoides	Absent	BC: Lower Fraser valley, South Okanagan, Creston, Lower Kootenay River
Smallmouth bass	5	*Micropterus*	*dolomieu*	Absent	CSRD: rotenone treatment in Gardom Lake
Trench	5	*Tinca*	*tinca*	Absent	BC: Okanagan, Kootenay River (near Creston)
Walleye (southern BC)	5	*Sander*	*vitreus*	Absent	BC: Castlegar, Lower Arrow Lake
Atlantic salmon	6	*Salmo*	*salar*	Absent	BC: Lower Fraser Valley
Brown Trout	6	*Salmo*	*trutta*	Present	CSRD: Trout Lake
Eastern Brook Trout	6	*Salvelinus*	*fontinalis*	Present	CSRD: Gardom Lake, Columbia River System (iMapBC). Local rod and gun club has seen population increase (anecdotal), want to ask for regulation changes to increase harvest.
Fathead minnow	6	*Pimephales*	*promelas*	Absent	BC: Lower Fraser valley, Two Island Lake (near Tupper)
Rainbow trout	6	*Oncorhynchus*	*mykiss*	Present	CSRD: all IPMAs
Red bellied pacu	6	*Piaractus*	*brachypomus*	Absent	BC: One caught in Nanaimo and one caught in Williams Lake but neither have established

Red shiner	6	*Cyprinells*	*lutrensis*	Absent	

Fungi	**Priority**	***Genus***	***Species***	**Present in CSRD?**	**Known Location(s)**
Death cap	3	*Amanita*	*phalloides*	Absent	BC: Vancouver, Victoria, Lower Fraser valley
White pine blister rust	6	*Cronartium*	*ribicola*	Present	CSRD: all IPMAs. Columbia mtns and Seymour arm have a surveillance gap
Insects	**Priority**	***Genus***	***Species***	**Present in CSRD?**	**Known Location(s)**
Spotted lantern fly	1	*Lycorma*	*delicatula*	Absent	
Argentine ant	2	*Linepithema*	*humile*	Absent	BC: Victoria
Asian needle ant	2	*Pachycondyla*	*chinensis*	Absent	
Asian longhorned beetle	2	*Anoplophora*	*glabripennis*	Absent	
Emerald ash borer	2	*Agrilus*	*planipennis*	Absent	BC: Vancouver 2024
Japanese beetle	2	*Popillia*	*japonica*	Absent	BC: Vancouver, Burnaby, and Port Coquitlam. Kamloops 2024.
Northern giant hornet	2	*Vespa*	*mandarinia*	Absent	BC: Eradicated from Nanaimo in 2019, confirmed in the Fraser Valley in 2020. No new detections in BC or Washington since 2021 (as of 2024).
Spongy moths (Asian & European)	2	*Lymantria*	*spp.*	Unknown	BC: Lower Mainland, Vancouver Island, Salt Spring Island, Kamloops, Kelowna, and Cranbrook. US: Washington
Apple maggot	3	*Rhagoletis*	*pomonella*	Absent	BC: Vancouver and surrounding area, Fraser Valley, Vancouver Island, Gulf Islands, and Prince George.
European fire ant	4	*Myrmica*	*rubra*	Absent	BC: Naramata/Okanagan Valley, Lower Mainland, Fraser Valley, Southern Vancouver Island
Little fire ant	4	*Wasmannia*	*auropunctata*	Absent	
Tropical stinging ant	4	*Hypoponera*	*punctatissima*	Unknown	
Impressive fire ant	4	*Myrmica*	*specioides*	Unknown	
Balsam woolly adelgid	5	*Adelges*	*piceae*	Present	BC: Interior, as far north as Horsefly and to the east as far as Nelson. Parks Canada: monitoring at MRG
Brown marmorated stink bug	5	*Halyomorpha*	*halys*	Present	CSRD: north of Salmon Arm (confirmed iNaturalist observation) BC: Southwestern BC, including Vancouver, Fraser Valley, Vancouver Island, and Kelowna
Drumming katydid	5	*Meconema*	*thalassinum*	Absent	BC: Lower Mainland
European chafer beetle	5	*Amphimallon*	*majale*	Present	BC: CSRD (Revelstoke), Vancouver
European paper wasp	5	*Polistes*	*dominula*	Present	CSRD: All IPMAs
Large yellow underwing moth	5	*Noctua*	*pronuba*	Absent	BC: Vancouver, Vancouver Island, Grand Forks and south of Penticton
Praying mantis (European)	5	*Mantis*	*religiosa*	Present	BC: Vancouver, Okanagan and Shuswap
Spotted wing drosophila	5	*Drosophila*	*suzukii*	Present	CSRD: Columbia Basin
Winter moth	5	*Operophtera*	*brumata*	Absent	BC: Vancouver, Southern Vancouver Island
Woodlouse spider	5	*Dysdera*	*crocata*	Absent	BC: Victoria
Codling moth	6	*Cydia*	*pomonella*	Present	CSRD: orchards in Salmon Arm
Garden soldier fly	6	*Exaireta*	*spinigera*	Unknown	

Seven-spotted ladybug	6	*Coccinella*	*septempunctata*	Present	CSRD: All IPMAs
Western yellow striped armyworm	6	*Spodoptera*	*praefica*	Unknown	BC: Reported for the first time in the North Okanagan Valley (Enderby, Armstrong and Spallumcheen) in July 2018
Invertebrates	**Priority**	***Genus***	***Species***	**Present in CSRD?**	**Known Location(s)**
Apple snail	1	*Ampullariidae*	spp.	Absent	
Conrad's false mussel	1	*Mytilopsis*	*leucophaeata*	Absent	
Golden Mussel	1	*Limnoperna*	fortunei	Absent	US: California
Marbled crayfish	1	*Procambarus*	*fallax f. virginalis*	Absent	
Ringed crayfish	1	*Orconectes*	*neglectus*	Absent	
Rusty crayfish	1	*Orconectes*	*rusticus*	Absent	
Spiny waterflea	1	*Bythotrephes*	*longimanus*	Absent	
Zebra and Quagga mussel	1	*Dreissena*	*polymorpha & bugensis*	Absent	Canada: Manitoba USA: Idaho, Snake River, Twin Falls. Flows into Columbia River (US section)
European Brown garden snail	2	*Cornu*	*aspersum*	Absent	BC: Vancouver Island and the Lower Mainland
Red swamp crayfish	2	*Procambarus*	*clarkii*	Absent	BC: Lower Mainland
Virile crayfish	2	*Faxonius*	*virilis*	Absent	BC: Confirmed in the Kootenay's (Lillian Lake and Moyie Lake 2023). Risk assessment in prep. AB: Single individual confirmed in Bow Lake in 2022
Corbicula clam (Freshwater/Asian)	3	*Corbicula*	*fluminea*	Present	CSRD: Shuswap Lake (Salmon Arm, Sicamous Narrows). Pit, Coquitmand and Lower Fraser Rivers too. Washington: Pend d'Oreille
Cherry shrimp	3	*Neocaridina*	*davidi*	Absent	
Chinese, Japanese and other mystery snails	3	*Cipangopaludina spp./Bellamya*	*chinensis*	Absent	BC: Lower Fraser Valley (up to Hope), Southern Vancouver Island Idaho: Priest Lake
New Zealand mudsnail	3	*Potamopyrgus*	*antipodarum*	Absent	BC: Vancouver Island (Port Alberni) Washington: Spokane
Grove snail/ brown-lipped snail	5	*Cepaea*	*nemoralis*	Present	CSRD: Golden, Revelstoke
Peach blossom jellyfish	5	*Craspedacusta*	*sowerbyi*	Unknown	BC: Okanagan Lake, Kamloops, Lower Mainland, Sunshine Coast, Vancouver Island
Land slugs	5	*Arion*	*rufus* and *vulgaris*	Present	*rufus* - CSRD
European black slug	6	*Arion*	*ater*	Unknown	CSRD: potentially MRG
Giant garden slug/ leopard slug/ great grey slug	6	*Limax*	*maximus*	Present	CSRD: Revelstoke
Japanese mussel / Asian date mussel	6	*Musculista*	*senhousia*	Absent	
New Zealand green-lipped mussel	6	*Perna spp.*		Absent	
Northern quahog clam	6	*Mercenaria*	*mercenaria*	Absent	
Spanish slug	6	*Arion*	*vulgaris*	Absent	
Varnish clam	6	*Nuttalia*	*obscurata*	Absent	

Mammals	Priority	*Genus*	*Species*	Present in CSRD?	Known Location(s)
Nutria	1	*Myocastor*	*coypus*	Absent	BC: No confirmed occurrences. Historically found in the Lower Fraser River valley and Salt Spring Island. US: Washington, Oregon, California
Feral pig	2	*Sus*	*scrofa*	Present	CSRD: Few reports of uncontained domestic pigs BC: reported in low numbers in the Lower Mainland, Vancouver Island, Thompson-Okanagan, Peace, Chilcotin and Kootenay Regions.
Fallow deer	3	*Dama*	*dama*	Absent	BC: Mayne and Sidney Islands
Virginia opossum	3	*Didelphis*	*virginiana*	Absent	BC: Lower mainland, Fraser Valley, Hornby island
Eastern fox squirrel	4	*Sciurus*	*niger*	Absent	BC: Southern Okanagan valley
Eastern grey squirrel	4	*Sciurus*	*carolinensis*	Absent	BC: Vancouver and surrounding area, Fraser Valley, Okanagan, Vancouver Island, 100 Mile House, Quesnel, Kamloops, Vernon, and Falkland
European rabbit	4	*Oryctolagus*	*cuniculus*	Present	BC: Vancouver Island, Triangle Island, the Southern Coast, and the Okanagan CSRD: unconfirmed in Revelstoke (Big Eddy)
Norway/Brown rat	4	*Ratus*	*norvegicus*	Present	BC: Lower Mainland and coastal islands, Okanagan Valley (Vernon, Kelowna, Penticton, Osoyoos), Kamloops, the Shuswap area, Revelstoke, and the Kootenay region (Nelson, Castlegar, New Denver, Creston) CSRD: Revelstoke, Sicamous, Shuswap
Roof/Black rat	4	*Ratus*	*ratus*	Present	BC: Lower Mainland and coastal islands, Okanagan Valley (Vernon, Kelowna, Penticton, Osoyoos), Kamloops, the Shuswap area, Revelstoke, and the Kootenay region (Nelson, Castlegar, New Denver, Creston) CSRD: Revelstoke, Sicamous, Shuswap
Eastern cottontail rabbit	5	*Sylvilagus*	*floridanus*	Absent	BC: Lower Mainland, Vancouver Island
House mouse	6	*Mus*	*musculus*	Present	CSRD
Reptiles	**Priority**	***Genus***	***Species***	**Present in CSRD?**	**Known Location(s)**
Italian wall lizard	1	*Podarcis*	*siculus*	Absent	BC: Single occurrence in Vancouver in 2019 US: Orcas Island Washington
Softshell turtle	1	*Apalone*	spp.	Absent	BC: One lone turtle in 2011 in Stanley Park, none since
European wall lizard	4	*Podarcis*	*muralis*	Unknown	BC: Vancouver Island and Lower Mainland CSRD: Reported at Little River Bridge (unconfirmed)
Red-eared slider	4	*Trachemys*	*scripta*	Absent	BC: Vancouver Island, Gulf Islands, the Lower Mainland, and Southern Interior CSRD: Justin DeMerchant (ISCBC) did comprehensive turtle surveys in 2022 and found none in the shuswap
Snapping turtle	3	*Chelydra*	*serpentina*	Absent	BC: Vancouver Island and Clearwater
Western fence lizard	6	*Sceloporus*	*occidentalis*	Absent	BC: Kamloops US: Washington

APPENDIX H: USEFUL RESOURCES

Columbia Shuswap Invasive Species Society

- www.columbiashuswapinvasives.org

Province of BC

- Main invasive species landing webpage: https://www2.gov.bc.ca/gov/content/environment/plants-animals-ecosystems/invasive-species
- BC Ministry of Forests. 2024. *Invasive Plant Pest Management Plan for Provincial Public Lands in Southern and Coastal British Columbia (FOR-SBC-PMP-2024-2029)*. Range Branch, Ministry of Forests
- BC Inter-Ministry Invasive Species Working Group. 2021. *Provincial Priority Invasive Species*. https://www2.gov.bc.ca/assets/gov/environment/plants-animals-and-ecosystems/invasive-species/publications/provincial_priority_is_list.pdf

Invasive Species Council of BC

- https://bcinvasives.ca/

InvasivesBC Application

- Database that includes invasive plant inventory, treatment and monitoring information, map display, and training modules for standardized operations https://invasivesbc.gov.bc.ca/Landing

Invasive Species Legislation

- BC Laws. 2009 (updated 2017). Controlled Alien Species Regulation. https://www.bclaws.gov.bc.ca/civix/document/id/complete/statreg/94_2009
- BC Weed Control Act: http://www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/00_96487_01
- Forest and Range Practices Act Invasive Plant Regulation: http://www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/18_18_2004
- Community Charter Act Environment and Wildlife Regulation: http://www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/41_144_2004

Invasive Species Frameworks/Strategies

- Columbia Basin Aquatic Invasive Species Steering Committee. 2015 (Updated 2021). Canadian Columbia Basin Aquatic Invasive Species Framework https://columbiashuswapinvasives.org/about-csiss/columbia-basin-aquatic-invasive-species-team/
- Ministry of Forests. 2004. Invasive Alien Species Framework for BC: Identifying and Addressing Threats to Biodiversity https://www2.gov.bc.ca/assets/gov/environment/plants-animals-and-ecosystems/invasive-species/imiswg/moe_alien_species_framework_bc_2004.pdf

- Invasive Species Council of BC. 2024. *Invasive Species Strategy for BC 2024-2028.* https://bcinvasives.ca/wp-content/uploads/2024/07/Invasive-Species-Strategy-for-British-Columbia-2024-2028-WEB.pdf

Regional Organizations/Partners

- Columbia Shuswap Regional District https://www.csrd.bc.ca/188/Noxious-Weed-Control
- Central Kootenay Invasive Species Society https://ckiss.ca/resources/publications/
- East Kootenay Invasive Species Council https://www.ekisc.com/ekisc-publications
- North West Invasive Plant Council https://nwipc.org/
- North Okanagan Regional District https://www.rdno.ca/rdno-services/noxious-weeds-invasive-plants
- Thompson-Nicola Invasive Plant Management Committee https://www.tnrd.ca/services/invasive-plant-management/