

SHUSWAP NORTH OKANAGAN RAIL TRAIL INVASIVE PLANT MANAGEMENT PLAN



PREPARED BY

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PREPARED FOR

Splatsin te Secwépemc
Columbia Shuswap Regional District
Regional District of North Okanagan

Acknowledgements

This report was produced and submitted by Laura Gaster Field Operations Manager, Columbia Shuswap Invasive Species Society. Invasive alien plant assessment protocols follow the Province of British Columbia’s Invasive Alien Plant Program and InvasivesBC. The Columbia Shuswap Invasive Species Society is a non-profit organization dedicated to the prevention, management and reduction of invasive species in the Columbia Shuswap Regional District.

The Secwépemc people have never ceded or surrendered any part of Secwépemcúłecw and therefore remain the true title holders to their homelands. The information contained in this document does not represent or limit Splantsin’s Aboriginal rights, title or interests for the project area.

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Acronyms and Abbreviations

CSISS	Columbia Shuswap Invasive Species Society
CSR D	Columbia Shuswap Regional District
RDNO	Regional District of North Okanagan
ALR	Agricultural Land Reserve
IPM	Integrated Invasive Plant Management
EDRR	Early Detection Rapid Response
SNO	Shuswap North Okanagan Rail Trail

Table of Contents

1.0 Purpose.....	5
2.0 Background.....	5
3.0 Rail Trail Site Descriptions and Values	6
3.1 Shuswap North Okanagan Rail Trail	6
3.2 Splitsin Territory	7
3.3 Agricultural Land Commission.....	7
4.0 Invasive Plant Inventory and Treatments	7
4.1 Weed Control Act.....	7
4.2 Columbia Shuswap Regional District Invasive Plant Inventory and Treatment	10
4.3 Regional District of North Okanagan Invasive Plant Inventory	11
5.0 Shuswap North Okanagan Rail Trail Recommendations.....	14
5.1 Invasive Plant Treatment Recommendations	14
5.2 Invasive Species Coordination.....	16
5.2.1 Splitsin Coordination	16
5.2.2 Agricultural Land Reserve Coordination.....	16
5.2.3 Revegetation Plan Coordination	16
5.3 Invasive Plant Education and Outreach Recommendations	16
5.4 Best Management Practices.....	17
5.5 Other Species of Note	17
5.5 Annual Schedule and Budget Recommendations	18
6.0 Appendix A Provincial Priority Definitions	19
7.0 Appendix B CSISS- Salmon Arm IPMA Priority Invasive Plant List.....	20
8.0 Appendix C Priority Invasive Plant Fact Sheets	21
9.0 Appendix D Best Management Practices for Invasive Plants in Parks and Protected Areas of BC.....	22
10.0 References.....	23

1.0 Purpose

The Columbia Shuswap Invasive Species Society (CSISS), acting as a qualified contractor on behalf of Spltasin te Secwépemc (Spltasin), Columbia Shuswap Regional District (CSRD) and Regional District of North Okanagan (RDNO) will deliver an invasive plant management plan for the Shuswap North Okanagan Rail Trail Corridor between Sicamous and Armstrong. The management plan will establish a schedule of recommended activities to prevent, manage and monitor priority invasive plants which impact the site both ecologically and economically. The management plan will acknowledge agricultural values and the role of the Agricultural Land Commission (ALC) and the protection of sensitive environmental and cultural sites along the corridor with respect to the Spltasin.

2.0 Background

Invasive species are one of the greatest threats to the ecological and economic well-being of the planet (Pyšek *et al.* 2020). Invasive species are a significant threat to global biodiversity (Vilà *et al.* 2011; Bellard *et al.* 2016), and have the potential to impose substantial negative social, economic and environmental impacts on ecosystems and communities across British Columbia. In British Columbia, 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). Sensitive habitats, typically selected for protection and conservation, can be particularly vulnerable to the impacts of invasive species (MFLNRORD 2019). Within sensitive habitats, invasive species establish quickly and spread easily across landscapes, displacing native wildlife and plants, and contributing to habitat change and overall ecosystem alteration (MFLNRORD 2019). Mitigating the impacts of invasive species requires a coordinated and landscape-level approach involving multiple stakeholders (MFLNRORD 2019).

Invasive species can significantly impact Indigenous communities by affecting infrastructure, economies, health and cultural practices including traditional economies and harvesting. Indigenous peoples have an inherent relationship with the land and environment, stewardship of the land is fundamental and rooted in their cultures and histories. Many plants and animals have special meanings and important cultural, spiritual, and traditional significance, as well as being important food sources. It is important to prioritize Spltasin cultural values and all of the species that encompass a healthy, functioning ecosystem. The close and critical connections that Indigenous communities have with the land, plants and animals and the loss of biodiversity have made invasive species management a priority for many First Nations, and therefore, it is important to incorporate First Nations management perspectives into treatment plans. Priorities along the Shuswap North Okanagan Rail Trail Corridor include protection of sensitive habitat and natural environments and protection of archeological and culturally significant sites (Trail Development Plan, 2021).

Given limited resources for invasive species management, it is usually necessary to prioritize activities to achieve the best result. Invasive species can be prioritized for treatment based on the following factors:

- Risks from not managing the species;
- Phase of invasion (current and potential distribution);
- Effectiveness of available treatment strategies;
- Effectiveness and availability of biocontrol agents (for invasive plants); 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. 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 implementing other best management practices. During the *eradication phase*, the species has a very limited distribution and early detection, rapid response (EDRR) 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 small, high-priority sites (CSISS 2020).

Integrated Invasive Plant Management (IPM) provides land managers with information essential to making well informed management decisions. IPM assessments consider sensitive ecosystems, vectors of spread and disturbance factors. Treatment can be comprised of mechanical, biological agent, chemical or cultural management, utilizing both spot and broad applications, where appropriate. One or many treatments may be utilized. Monitoring is vital to evaluate management actions, and adjust if necessary, to reach IPM objectives efficiently and effectively. For more information on Integrated Invasive Plant Management, please consult the Invasive Plant Pest Management Plan for Provincial Crown Lands within the Southern Interior (MFLNRORD 2019).

Integrated Invasive Plant Management (IPM) is comprised of:

- Prevention;
- Identification;
- Surveys, Inventory and Data Management;
- Establishing Priorities and Management Strategies;
- Invasive Plant Treatment Options;
- Treatment Method Selection; and
- Monitoring and Evaluation (MFLNRORD 2019).

3.0 Rail Trail Site Descriptions and Values

3.1 Shuswap North Okanagan Rail Trail

The Shuswap North Okanagan Rail Trail provides a connection between communities, unfolding the true story within Secwépemc territory, protecting natural areas and habitat for wildlife, facilitating healthy outdoor recreational activities and travel options on foot and by bicycle, conserving heritage, cultural, & agricultural values, and encouraging recreational tourism in rural areas (<https://shuswapnorthokanaganrailtrail.ca/>).

At just over 50 kilometres long, the non-motorized greenway trail will connect the communities of Sicamous, Electoral Area E of the CSRD, Electoral Area F of the RDNO, Enderby, Grindrod, Splatins, Spallumcheen, and Armstrong through Splatins Territory (Trail Development Plan, 2021).

The rail trail corridor encompasses the biogeoclimatic zones of Interior Cedar Hemlock (ICHxm1, ICHdw4) to the north and Interior Douglas Fir (IDFxh1) to the south. The Rail Trail corridor borders the western shore of Mara Lake, connects with the Shuswap River on the east, crosses Rosemond Lake, Violet Creek, Gardom Creek, Fortune Creek, Leduc Creek, Harland Creek, Hussard Creek, Sneesby Creek, Lindsay Creek, Glanzier Creek, Kendry Creek, and Alderson Creek, each of which has been classified as a Sensitivity Rating as High and an Aquatic Habitat Index Rating as High or Very High (Trail Development Plan, Appendix C, Environmental, 2021).

3.2 Splatsin Territory

The Secwépemc people have occupied the south-central part of British Columbia for at least 10,000 years with the Secwépemulecw (territory) extending from the Columbia River Valley on the east slope of the Rocky Mountains to the Fraser River on the west and from the upper Fraser River in the north to the Arrow Lakes in the south.

Secwépemulecw covers a vast area; approximately 180,000 square km.

Splatsin is the southern-most community of the Secwépemc Nation. Splatsin's area of caretaker responsibility within Secwépemulecw extends east into the Columbia Basin, north to the Mica Creek area, south to Kettle Falls, Washington USA, and as far west as Monte Lake, BC.

Splatsin has been a leading partner in the Rail Trail initiative. The project has brought both government and non-government groups together to collaboratively develop the Shuswap North Okanagan Rail Trail Corridor. The common core values of the project are sustainability and ecological protection (Trail Development Plan 2021).

In 2014, Splatsin leadership successfully negotiated with CP Rail to purchase 11.7 hectares (29 acres) of the discontinued railway corridor between Sicamous and Armstrong. This includes a 1.5 kilometre section south of Sicamous along the shores of Mara Lake, and a 6 kilometre section south of Enderby. The agreement was an important acknowledgement of the Splatsin's role as primary caretaker of the land in the region and the title and rights of the Secwépemc Nation through which the abandoned rail corridor runs.

Splatsin Chief and Council recognized the long-term tourism and transportation potential for the corridor, as well as the opportunity to revitalize Splatsin culture and connections back to the land. In January 2015, they invited municipal and regional leadership to join them in developing an agreement to work together to acquire the remaining sections of the corridor from CP Rail and develop a plan for its future.

Splatsin, regional and municipal leadership confirmed their intention to work together cooperatively to acquire the Okanagan Shuswap Railway through a jointly signed Memorandum-of-Understanding (2019). An Inter-Jurisdictional Negotiating Team was appointed and Terms-of-Reference developed to jointly acquire the remainder of the rail corridor from the CPR.

<https://shuswapnorthokanagairailtrail.ca/history-and-background/>

3.3 Agricultural Land Commission

A large portion of the Shuswap North Okanagan Rail Trail, approximately 35 km of the 51 km trail, is classified as Agricultural Land Reserve (ALR), comprising of 105 ALR property titles adjacent to the rail trail and approximately 1,733 Ha of adjacent ALR land or land with the potential to be affected by the rail trail development. ALR properties owned by the CSRD and RDNO within the Shuswap North Okanagan rail trail corridor are not actively farmed. The farmed ALR properties are used for hay production, forage and corn (60% of properties, not area), dairy (9%), cattle (6%), and the remainder (25%) include hobby farms or vacant land (Trail Development Plan, Appendix D-Agricultural, 2020). As stated in a Memorandum of Understanding (2019), the vision of inter-jurisdictional collaboration is, among other goals, to protect the environmental, agricultural and cultural values.

4.0 Invasive Plant Inventory and Treatments

4.1 Weed Control Act

The BC Weed Control Act (R.S.B.C. 1996, c.487), states that a land owner must control noxious weeds growing or located on the land which it occurs. The purpose of the Act is to protect the province's economy, natural resources, and society from the negative impacts of invasive plants. The Act is administered by the Ministry of Forests.

It can be helpful for land managers to use prioritization and risk assessment tools when resources are limited in invasive species management. The Province of BC periodically updates a provincial priority invasive plant list to assist with invasive plant management decisions (Appendix A). Additionally, the Columbia Shuswap Invasive Species Society annually updates the Columbia Shuswap priority invasive plant lists to assist with invasive plant management decisions on a regional scale; this list is updated with the assistance of the Province of BC and other local land managers (Appendix B).

Note, the Regional District of North Okanagan maintains a priority list for invasive plants within their pest management plan through contractors Spectrum Resource Group, but for the purpose of this report, the Columbia Shuswap Priority List for invasive plants will be utilized within the RDNO portion of the rail trail for simplicity and due to the risk of invasive plants moving northwards along the trail. The priority list for the North Okanagan will be considered for annual treatment planning along with the CSISS list and is included in Table 1 for reference.

Table 1. Invasive Species Recorded along the Shuswap North Okanagan Rail Trail (2018)

Provincial Priority definitions found in Appendix A

CSISS Priority definitions found in Appendix B

Species	Location	Provincial Status	Provincial Priority	CSISS Priority	RDNO Priority
Annual sow thistle (<i>Sonchus oleraceus</i>)	CSR	Provincially noxious		Unlisted- lowest priority	Established
Blackberry species	RDNO			Species unknown	Not listed
Bladder campion (<i>Silene cucubalus</i>)	CSR			Unlisted- lowest priority	Not listed
Bohemian knotweed (<i>Fallopia bohemica</i>)	CSR	Provincially noxious	Regional Containment/Control	Annual Control	High priority
Brown Knapweed (<i>Centaurea jacea</i>)	RDNO			Annual Control	Not listed
Bull thistle (<i>Cirsium vulgare</i>)	CSR/ RDNO			Management	Established
Burdock (<i>Arctium spp.</i>)	CSR/ RDNO	Regionally Noxious		Management	Established
Canada thistle (<i>Cirsium arvense</i>)	CSR/ RDNO	Provincially noxious		Management	Established
Chicory (<i>Cichorium intybus</i>)	CSR/ RDNO			Management	Established
Common tansy (<i>Tanacetum vulgare</i>)	CSR/ RDNO	Regionally Noxious	Regional Containment/Control	Containment	Low priority
Dalmatian toadflax (<i>Linaria genistifolia</i>)	CSR/ RDNO	Provincially noxious		Management	Established
Dame's rocket (<i>Hesperis matronalis</i>)	CSR			Insufficient Information	Not listed
Dyer's broom (<i>Genista tinctoria</i>)	RDNO			unlisted	Not listed

Flat pea vine (<i>Lathyrus sylvestris</i>)	CSRD			Insufficient Information	Not listed
Leafy spurge (<i>Euphorbia esula</i>)	CSRD	Provincially noxious	Regional Containment/Control	Annual Control	High priority
Heart-podded hoary cress (<i>Lepidium draba</i>)	RDNO			Prevent	Low priority
Hoary alyssum (<i>Berteroa incana</i>)	RDNO		Regional Containment/Control	Management	Low priority
Hounds tongue (<i>Cynoglossum officinale</i>)	RDNO	Provincially noxious		Management	Established
Meadow buttercup (<i>Ranunculus acris</i>)	CSRD			Management	Not listed
Meadow knapweed (<i>Centaurea pratensis</i>)	CSRD/ RDNO	Regionally Noxious		Management	Low priority
Mullein (<i>Verbascum thapsis</i>)	CSRD/ RDNO			Unlisted- Lowest priority	Not listed
Orange hawkweed (<i>Hieracium aurantiacum</i>)	CSRD/ RDNO	Regionally Noxious	Regional Containment/Control	Management	Low priority
Oxeye daisy (<i>Leucanthemum vulgare</i>)	CSRD/ RDNO			Management	Established
Perennial sow thistle (<i>Sonchus arvensis</i>)	RDNO	Provincially noxious		Unlisted- Lowest priority	Established
Plumeless thistle (<i>Carduus acanthoides</i>)	RDNO			Prevent	Low priority
Poison hemlock (<i>Conium maculatum</i>)	RDNO		Provincial containment	Annual Control	High priority
Queen Anne's Lace (<i>Daucus carota</i>)	CSRD			Management	Not listed
Rush skeletonweed (<i>Chondrilla juncea</i>)	RDNO	Provincially noxious	Provincial containment	Annual Control/Containment to North Okanagan pending inventory and discussion with land managers	High priority
Scentless chamomile (<i>Tripleurospermum inodorum</i>)	RDNO	Provincially noxious		Insufficient Information	Established
Spotted knapweed (<i>Centaurea stoebe</i>)	CSRD/ RDNO	Provincially noxious	Regional Containment/Control	Management	High priority
St John's wort (<i>Hypericum perforatum</i>)	CSRD/ RDNO			Management	Established

Sulphur cinquefoil (<i>Hieracium aurantiacum</i>)	CSR/ RDNO	Regionally Noxious	Management	Management	Low priority
Western goat's beard (<i>Tragopogon dublus</i>)	CSR/ RDNO			Management	Not listed
Wild chervil (<i>Anthriscus sylvestris</i>)	RDNO		Provincial containment	Regional EDRR	Low priority
Yellow hawkweed spp. (<i>Hieracium spp.</i>)	CSR		Management	Management	Established

Provincially noxious – noxious within all regions of British Columbia

Regionally noxious – noxious within the boundaries of the corresponding regional districts

Highlighted species are priority for treatment.

4.2 Columbia Shuswap Regional District Invasive Plant Inventory and Treatment

In 2018, CSISS staff inventoried the Columbia Shuswap Regional District (CSR) portion of the recently acquired rail trail, approximately 11 km in length. The trail is a mosaic of native, agronomic, and invasive plant species. In total, 23 invasive plant species were documented along the length of the rail trail (Table 1), only one priority invasive plant species, leafy spurge (*Euphorbia esula*), was found in the initial inventory (Table 2; Map 1). A total of 300 m² was found along the northern most section of the rail trail. Due to the priority of leafy spurge, annual inventory, treatment and monitoring was recommended. Bohemian knotweed (*Fallopia bohemica*), a priority invasive plant species, was found in 2021 during a follow up inventory of the leafy spurge site. A total of 4 m² was documented, due to the priority of the species, annual inventory, treatment and monitoring was recommended for the Bohemian knotweed (Table 2; Map 1). Priority invasive plant information can be found in Appendix C.

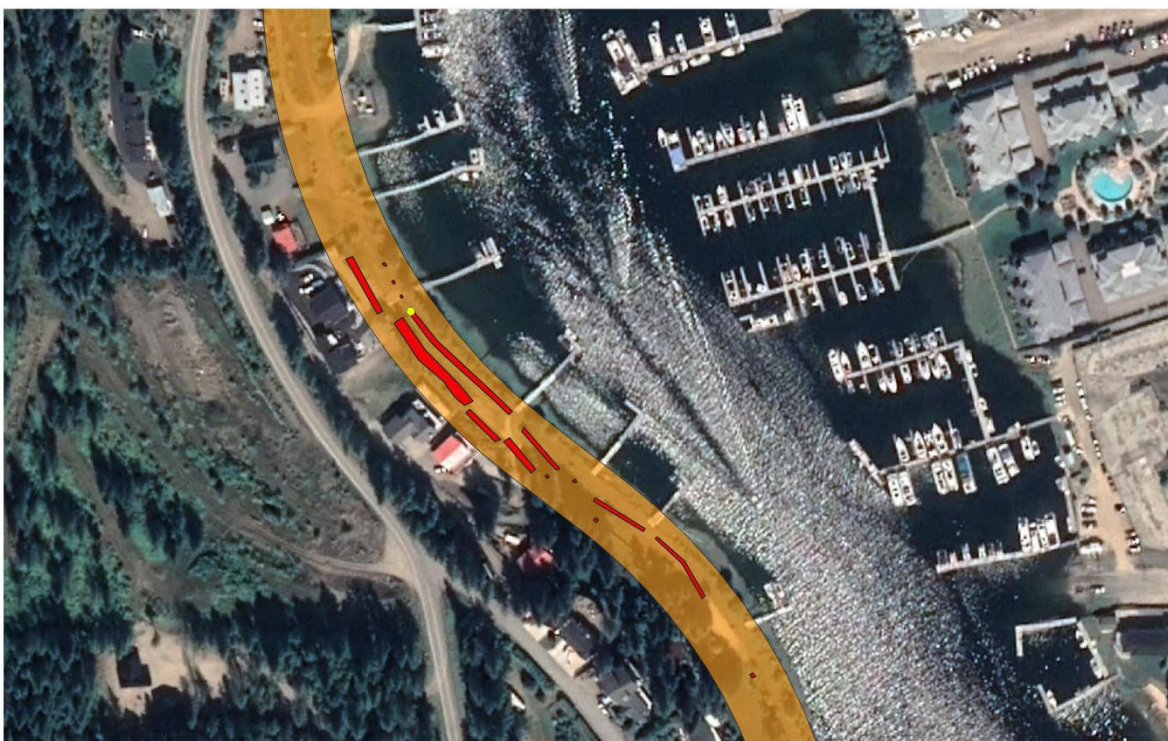
Table 2: Priority Invasive Plant Inventory and Treatment for the CSR

Priority Invasive Plant Inventory CSR				
Species	Date	Area (m ²)	Treatment	Notes
Leafy spurge (<i>Euphorbia esula</i>)	2018	300	None	Initial Inventory
	2019	300	None	
	2020	300	None	
	2021	300	Spot application of herbicide, mechanical treatment within Pesticide Free Zone (PFZ)	All plants treated
	2022	250	Spot application of herbicide, mechanical treatment within Pesticide Free Zone (PFZ)	All plants treated
	2023	124	Spot application of herbicide, mechanical treatment within Pesticide Free Zone (PFZ)	All plants treated
Bohemian Knotweed	2021	4	Spot application of herbicide	Initial inventory, All plants treated

<i>(Fallopia bohemica)</i>	2022	3	Spot application of herbicide	All plants treated
	2023	0	No weed found	No treatment. Continue monitoring.

As with all invasive plant species, eradication is a multi year effort. The Ministry of Forests monitoring years post no-weed-found (following treatment), suggests that Bohemian knotweed is monitored for 20 years post no-weed-found and leafy spurge is monitored for 18 years post no-weed-found (MoF 2017).

Map 1: Priority Species Located within the CSRD Portion of the Rail Trail



CSRD Portion of Rail Trail
 Leafy Spurge and Bohemian knotweed

- Bohemian Knotweed
- Leafy spurge
- Shuswap North Okanagan Rail trail

0 50 100 m



4.3 Regional District of North Okanagan Invasive Plant Inventory

In 2018, RDNO staff inventoried the Regional District of North Okanagan (RDNO) portion of the recently acquired rail trail, approximately 40 km in length. The trail is a mosaic of native, agronomic, and invasive plant species. In total, 25 invasive plant species were documented along the length of the rail trail (Table 1), and six priority invasive plant species were found in the initial inventory (Table 3; Map 2), Brown Knapweed (*Centaurea jacea*), plumeless thistle (*Cardus acanthoides*), wild chervil (*Anthriscus sylvestris*), poison hemlock (*Conium maculatum*), rush skeletonweed (*Chondrilla juncea*), and heart-podded hoary cress (*Lepidium draba*). The surveyors noted blackberry spp. and dyer’s broom (*Genista tinctoria*) within the site comments, but a full inventory and the blackberry species were not recorded (note: there are

native blackberry species in British Columbia). No treatment data is associated with the invasive plant sites.

Area (m²) of the species surveyed by RDNO staff is discretionary due to the potential for a different survey method as the area recorded is notably high. We believe this may be due to the surveyor recording the overall area inventoried as infested, not the physical area of plants on the ground. In September 2023, CSISS staff conducted preliminary surveys of priority invasive plants at the locations identified by RDNO staff in the 2018 inventory to confirm species presence and determine the approximate physical area of plants (Table 3). Approximate physical area of invasive plants gives contractors better estimates for treatment costs versus the prior larger infestation areas that may include gaps in coverage. Further inventory will be required to determine the full extent of invasive plants on the RDNO section of the Rail Trail and inform future treatment.

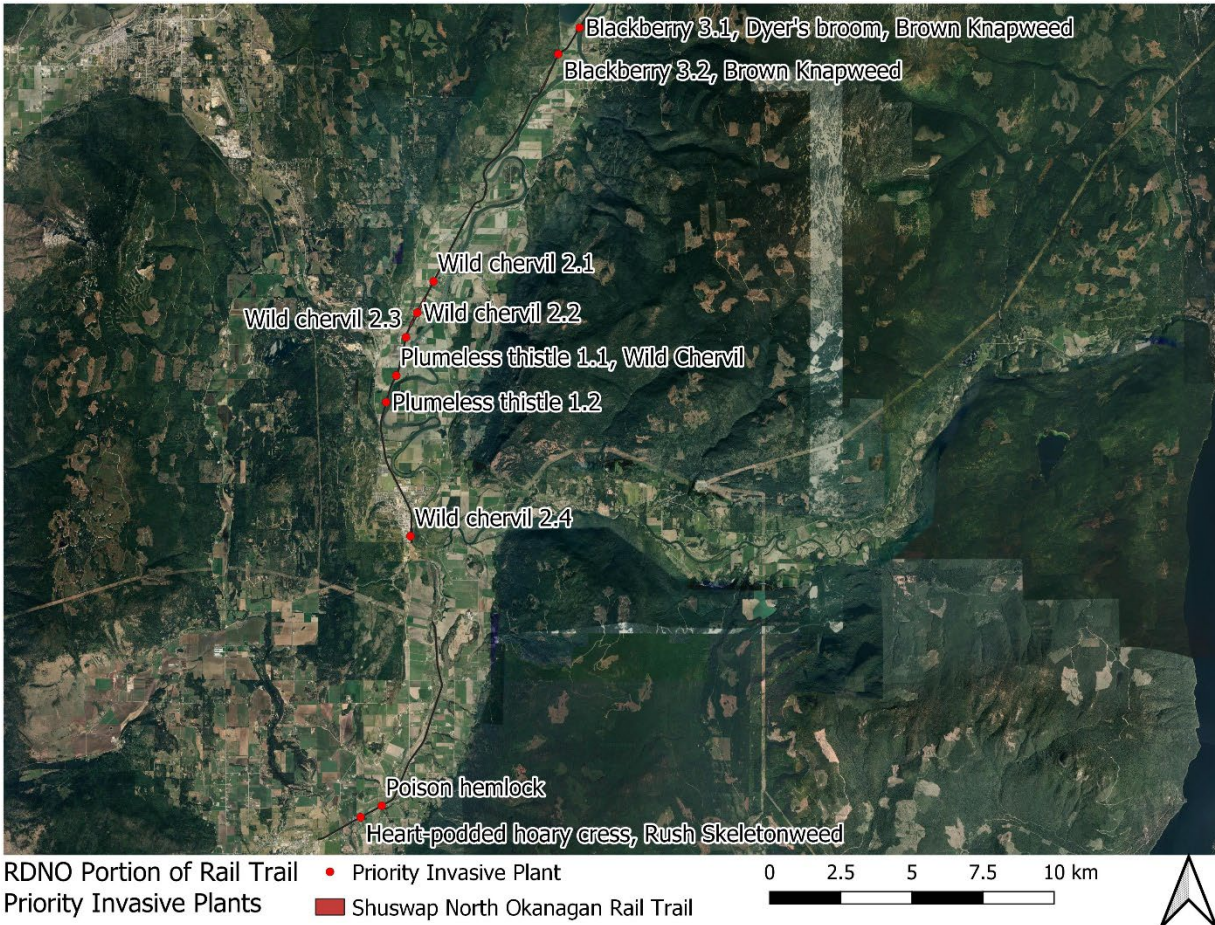
For the purpose of this report, the Columbia Shuswap Priority List for invasive plants will be utilized within the RDNO portion of the rail trail. Priority invasive plant information can be found in Appendix C.

Table 3: Priority Invasive Plant Inventory for the RDNO

Priority Invasive Plant Inventory RDNO				
Species	2018 Area (m ²)	2023 Area (m ²)	Treatment Recommendations	Notes
Plumeless thistle (<i>Carduus acanthoides</i>)	1,000	57	Spot application of herbicide	Location 1.1
Plumeless thistle (<i>Carduus acanthoides</i>)	3,000	N/A	Spot application of herbicide, if found.	Location 1.2, unable to access site in 2023
Wild chervil (<i>Anthriscus sylvestris</i>)	10,000	9	Spot application of herbicide	Location 2.1
Wild chervil (<i>Anthriscus sylvestris</i>)	500	62	Spot application of herbicide	Location 2.2
Wild chervil (<i>Anthriscus sylvestris</i>)	100	320	Spot application of herbicide	Location 2.3
Wild chervil (<i>Anthriscus sylvestris</i>)	10,000	No weed found	Spot application of herbicide, if found.	Location 2.4
Wild chervil (<i>Anthriscus sylvestris</i>)	N/A	107	Spot application of herbicide	Location 1.1
Poison hemlock (<i>Conium maculatum</i>)	7,000	75	Spot application of herbicide	
Rush skeletonweed (<i>Chondrilla juncea</i>)	200	N/A	Spot application of herbicide	Not surveyed in 2023
Heart-podded hoary cress (<i>Lepidium draba</i>)	100	No weed found	Spot application of herbicide, if found.	Surveyed conducted in late season,

				possible that plants had senesced
Dyer's broom (<i>Genista tinctoria</i>)	700	660	None	Not listed in InvasivesBC, unsure of Provincial status
Blackberry (spp unknown)	Unknown	No weed found	Spot application of herbicide, if found and invasive species	Location 3.1
Blackberry (spp unknown)	Unknown	No weed found	Spot application of herbicide, if found and invasive species	Location 3.2
Brown knapweed (<i>Centaurea jacea</i>)	N/A	2	Mechanical treatment or spot application of herbicide if/ when treating blackberry	Location 3.1
Brown knapweed (<i>Centaurea jacea</i>)	N/A	1	Mechanical treatment or spot application of herbicide if/ when treating blackberry	Location 3.2

Map 2: Priority Invasive Species Located within the RDNO Portion of the Rail Trail



5.0 Shuswap North Okanagan Rail Trail Recommendations

5.1 Invasive Plant Treatment Recommendations

Annual inventory of known, high priority invasive plants is recommended. Every year, there will be updates to specific species, so below we have included high priority invasive plants currently known. Annually, the species list will be updated in the appendix with total area infested.

Within the CSRD portion of the rail trail, it is recommended to continue invasive plant inventory for the high priority species of leafy spurge and Bohemian knotweed. Spot application of herbicide is recommended for both leafy spurge and Bohemian knotweed outside of the pesticide free zone (PFZ) and where the leafy spurge infestation falls within the PFZ, mechanical treatment is recommended, as in past years. Herbicide monitoring is recommended to ensure the PFZ is followed and to determine efficacy of the treatment (monitoring 2-6 weeks after treatment as appropriate and/or the following spring as appropriate).

Within the RDNO portion of the rail trail, it is recommended to inventory the locations where priority invasive plants were found (brown knapweed, plumeless thistle, wild chervil, poison hemlock, rush skeletonweed, heart-podded hoary cress, blackberry spp., dyer's broom). Complete inventories with detailed polygons of infestations and physical area of the plant species found on the landscape, in m², will assist with treatment planning (e.g. treatment type: mechanical/ chemical/ other, treatment cost, treatment timeline). Following further inventory of rush skeletonweed, blackberry species and dyer's broom, as well as conversations with land managers and provincial specialists, these species will be considered for treatment pending priority and feasibility for treatment.

Mechanical treatment of any reasonable/ small priority invasive plant infestations where the plant phenology is agreeable to treatment (e.g. plant has not yet set seed), perennial regrowth, culturally sensitive areas or within PFZ/ organic farm boundaries is also recommended to limit the spread of invasive plants.

It is recommended to chemically treat priority invasive plant infestations with spot applications of herbicide at sites where it is inadvisable to mechanically treat. Herbicide monitoring is recommended to ensure the PFZ is followed and to determine efficacy of the treatment (monitoring 2-6 weeks after treatment as appropriate and/or the following spring as appropriate).

A full length Shuswap North Okanagan Rail Trail inventory is recommended every 5 years. The first full inventory was completed in 2018. The next date for full invasive plant inventory is recommended for 2024 and should continue in perpetuity every 5 years to ensure new priority invasive plants are found and treated early to prevent their establishment and spread. In addition to the full invasive plant inventory, a simultaneous invasive species (non-plant) inventory should be conducted assessing non-native birds, amphibians, diseases, fish, fungi, insects, invertebrates, mammals, and reptiles, focusing on the species of highest concern.

The CSISS will deliver the following objectives to the Shuswap North Okanagan Rail Trail as part of the site-specific mitigation measures for each approved site:

1. Conduct invasive plant inventory (including non-plant species), map invasive plant and provide recommendations for site management;
2. Develop and implement a noxious and invasive weed control treatment schedule;
3. Conduct mechanical treatment of high priority invasive plants, where possible;
4. Administer herbicide treatment contract to a certified pesticide applicator;
5. Complete biological control agent monitoring, where applicable;
6. Monitor effectiveness of weed control treatment for at least 10% of sites and provide recommendations for future management plans;
7. Complete data entry and management using InvasivesBC database;
8. Complete a summary of the effectiveness of treatment.

5.2 Invasive Species Coordination

5.2.1 Splatsin Coordination

Along with treatment and management, coordination is required with land managers and neighbouring properties. Coordination with Splatsin values, interests, and direction is recommended annually at a spring meeting. Treatment plan review, options for subcontracting Splatsin staff for invasive plant work/ staff training, and discussion of cultural and medicinal plants to identify prior to any treatment to limit disturbance is recommended.

5.2.2 Agricultural Land Reserve Coordination

A large portion of the Shuswap North Okanagan Rail Trail, approximately 35 km of the 51 km trail, is classified as Agricultural Land Reserve (ALR), comprising of 105 ALR property titles adjacent to the rail trail and approximately 1,733 Ha of adjacent ALR land or land with the potential to be affected by the rail trail development (Trail Development Plan, Appendix D- Agricultural, 2020).

To mitigate the impacts of the invasive plant infestations it is important to notify landowners in the ALR about priority invasive plants found on the rail trail and to inform them of the proposed treatment plan. CSISS will request landowner contact information from the RDNO and notifications will be mailed to ALR properties directly adjacent to priority invasive plant infestations detailing the invasive plant and proposed treatment plan. Landowners, including organic farms, will need to reply to the letter within the specified time frame detailing organic farm status and/ or concern over any herbicide application to alter the treatment plan, which can include pesticide free zones and buffer zones.

It is the responsibility of the farmer/ landowner to disclose their farming status to CSISS, farm status will be taken into account prior to any herbicide application, ensuring organic farming status regulations are met, as long as notification is received within the specified timeframe. Landowners are responsible to treat infestations found on their private property.

5.2.3 Revegetation Plan Coordination

It is recommended to incorporate a revegetation plan into the treatment plan to mitigate or reduce the need for mechanical or chemical treatments in the future. A revegetation plan can identify priority locations for seeding or planting which can have lasting effects on the success of the initial treatment and overall health of the ecosystem. Annual planning will include a review of both the invasive plant management priorities and revegetation priorities with the rail trail technical operational committee to guide and identify annual revegetation efforts within the rail trail corridor.

The revegetation plan is currently under development at the time of this report.

5.3 Invasive Plant Education and Outreach Recommendations

Play Clean Go is an education and outreach campaign for outdoor recreationalists that encourages outdoor recreation while protecting our valuable natural resources. The objective is to slow or stop the

spread of terrestrial invasive species through changes in our behaviour. Play Clean Go is designed to foster actions that interrupt recreational pathways of spread for invasive species.

It is recommended to install permanent Play Clean Go stations (e.g. signage, 'boot brushes' and cleaning stations for bike/horse/other users), along the trail at appropriate locations encouraging trail users to follow simple steps to slow or stop the spread of invasive plants:

- REMOVE plants, animals and mud from boots, gear, pets and vehicles.
- CLEAN your gear before entering and leaving a recreation site.
- STAY on designated roads and trails.

The [SNO Rail Trail Amenities & Sign Standards \(November 08, 2022\)](#) adopted by the Rail Trail owners this year includes installation of the Play, Clean, Go education signage as part of the Welcome/Etiquette, Warning, & Agricultural Code of Conduct sign placement at all major access points to the rail trail corridor (see: Section 8.14 Play, Clean, Go - Invasive Management Signs on page 33).

Incorporating community through restoration events and weed pulls along the rail trail fosters a connection with nature, community and a sense of pride and accomplishment in oneself. It is recommended to host community weed pulls annually to tackle invasive plants which respond well to mechanical treatment in a safe and encouraging environment.

Training and workshop opportunities for CSRD, RDNO, Splatsin staff, community members, adjacent ALR landowners, and trail users on invasive plant identification and best management practices can educate, engage and inspire on the ground action and promote proper trail use and Play Clean Go practices. It is recommended to host annual training and workshops to deliver this important messaging through tailored sessions to focus on the specific interests and needs of the group.

5.4 Best Management Practices

Best Management Practices should be incorporated into all plans and management activities for the Shuswap North Okanagan rail trail targeting prevention and control that will result in disturbance to native vegetation and soils. Applying best management practices can help mitigate adverse effects of invasive species on our natural environment.

It is recommended to follow best management practices outlined by the Province of BC for Invasive Plants in Parks and Protected Areas of British Columbia. The complete document can be found here: <https://bcinvasives.ca/wp-content/uploads/2021/01/ISCBC-BC-Parks-BMP-180412-WEB.pdf>. An extract of the most relevant best management practices can be found in Appendix D.

5.5 Other Species of Note

Poison ivy, *Toxicodendron radicans*, can be found along the length of the rail trail. This is a native species in British Columbia and plays an important role in healthy ecosystems, therefore is not part of this invasive plant management plan. Poison ivy creates a social concern for trail users as contact with this plant can cause a red, itchy rash called allergic contact dermatitis. Caution should be noted for all users of

the rail trail. For more information visit: <https://www.healthlinkbc.ca/health-topics/poison-ivy-oak-or-sumac>

5.5 Annual Schedule and Budget Recommendations

It is recommended to annually review “Table 3: Annual Schedule and Budget Recommendations” and make adjustments based on capacity, budget, and updated invasive plant inventory data. The estimates provided in Table 3 are ideal estimates based on 2023 rates and data, but we understand less funding may be available and cost estimates may change annually based on inventory and day rates. CSISS intends to work with the Rail Trail owners to adapt Table 3 based on annual availability of funding, capacity, and any day/cost estimate adjustments.

Table 3: Annual Schedule and Budget Recommendations

Shuswap North Okanagan Rail Trail					
Management Recommendation	Timeline	Personnel	Day estimate	Cost Estimate*	Funder
Coordination and treatment planning (including with Splatsin and private landowners)	Annually Winter/ Spring	CSISS	6	\$3,210	SNO Rail Trail
Inventory priority invasive plants (including non-plant invasive species)	Annually May – Aug (<i>on years with no ‘full rail trail inventory’</i>)	CSISS	4	\$3,424	SNO Rail Trail
Mechanical treatment of priority invasive plants (if small infestation)	Annually May - Aug	CSISS	2	\$1,712	SNO Rail Trail
Spot application of herbicide for priority invasive plants, adhering to PFZs, two rounds of treatment.	Annually June - Oct	Herbicide Applicator	4	\$6,505	SNO Rail Trail
Herbicide monitoring of priority invasive plants	Annually June - Oct	CSISS	1	\$856	SNO Rail Trail
Full Rail Trail inventory	Every 5 years May - Aug (2024, 2029, 2034)	CSISS	6	\$5,136	SNO Rail Trail
Data entry, reporting and recommendations	Annually Fall/ Winter	CSISS	4	\$2,140	SNO Rail Trail
Outreach coordination – signage, workshops, training, social media	Annually Year round	CSISS	4	\$2,140	SNO Rail Trail
Total Personnel Costs – Annually				\$19,988	
Total Personnel Costs – Every 5 years				\$21,700	

* CSISS rates: Manager Level \$535/day; x2 Field Technicians \$856/day; Herbicide Contractor: \$202.30/hour including product

Equipment and Travel				
Item	Rate	Total	Description	Funder
Travel	\$0.61/km	\$1,982	250km/ round trip x 13 field days	SNO Rail Trail
Garbage bags, shovels, iPad (% of new iPad)	n/a	\$1,000	n/a	SNO Rail Trail
Sub Total		\$2,982		

Project Totals				
Item	Rate	Total	Description	Funder
Administration-Annually	12%	\$2,756	Includes bookkeeping, payroll, office, storage, insurance, bank fees, ED Admin Time	SNO Rail Trail
Administration-Every 5 years	12%	\$2,961	Includes bookkeeping, payroll, office, storage, insurance, bank fees, ED Admin Time	SNO Rail Trail
Grand Total				
Annual		\$25,726		
Every 5 years		\$27,643		

6.0 Appendix A Provincial Priority Definitions

PROVINCIAL PRIORITY DEFINITIONS (as per February 2020 list: https://www2.gov.bc.ca/assets/gov/environment/plants-animals-and-ecosystems/invasive-species/guidance-resources/provincial_priority_is_list_final2019_march2_2020_posted_online.pdf)		
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.

7.0 Appendix B CSISS- Salmon Arm IPMA Priority Invasive 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.		
<ul style="list-style-type: none"> - Bighead knapweed - Buffalobur - Bur chervil - Colt’s foot - Common bugloss - Garlic mustard - Giant knotweed 	<ul style="list-style-type: none"> - Gorse - Greater knapweed - Himalayan knotweed - Hoary cress - Japanese butterbur - Longspine sandbur - Nodding thistle 	<ul style="list-style-type: none"> - North Africa grass - Plumeless thistle - Puncturevine - Spurge laurel - Tansy ragwort - Tree of heaven - 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.		
<ul style="list-style-type: none"> - Cypress spurge - Field scabious - Giant hogweed 	<ul style="list-style-type: none"> - Russian knapweed - Short-fringed knapweed 	<ul style="list-style-type: none"> - 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.		
<ul style="list-style-type: none"> - Baby’s breath - Black knapweed (BC) - Blueweed - Bohemian knotweed - Brown knapweed - Himalayan blackberry 	<ul style="list-style-type: none"> - Japanese knotweed - Leafy spurge (BC) - Poison hemlock - Policeman’s helmet - Rush skeletonweed (BC) 	<ul style="list-style-type: none"> - 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: <ul style="list-style-type: none"> - Butterfly bush - Common periwinkle - English holly - English ivy - Garden yellow loosestrife 	Contain to gardens Cont’d: <ul style="list-style-type: none"> - Russian olive - Salt cedar/ Tamarisk - Siberian elm Contain to White Lake:	Contain to west portion of IPMA (treat Seymour Arm and east portion of IPMA): <ul style="list-style-type: none"> - Common tansy

<ul style="list-style-type: none"> - Goutweed - Mountain bluet - Myrtle spurge 	<ul style="list-style-type: none"> - Fragrant water lily <p>Contain to Crazy Creek RR:</p> <ul style="list-style-type: none"> - Marsh plume thistle 	<p>Contain to Shuswap/ Mara/White Lake:</p> <ul style="list-style-type: none"> - Eurasian water milfoil
<p>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.</p>		
<ul style="list-style-type: none"> - Bull thistle (BC) - Burdock - Canada thistle (BC) - Caraway - Chicory - Common comfrey - Dalmatian toadflax (BC) - Diffuse knapweed (BC) - Hoary alyssum 	<ul style="list-style-type: none"> - Hound’s tongue (BC) - Knapweed spp. (BC) - Meadow buttercup - Meadow goat’s beard - Meadow knapweed (BC) - Nightshade - Orange hawkweed - Oxeye daisy - Purple loosestrife (BC) 	<ul style="list-style-type: none"> - 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)
<p>INSUFFICIENT INFORMATION – Species have insufficient information on their distribution, impacts, potential for spread and/or feasibility of control. Further information is required.</p>		
<ul style="list-style-type: none"> - Bachelor’s button - Black locust - Carpet burweed - Creeping buttercup - Curly leaf pondweed - Dame’s rocket 	<ul style="list-style-type: none"> - Eyebright - Field bindweed - Flat peavine - Greater celandine - Green foxtail - Kochia 	<ul style="list-style-type: none"> - Lady’s thumb - Russian thistle - Scentless chamomile (BC) - Sweet fennel - Wild four o’clock - Woolly vetch

BC – biocontrol

8.0 Appendix C Priority Invasive Plant Fact Sheets

[Bohemian knotweed](#)

[Brown Knapweed](#)

[Heart podded hoary cress](#)

[Leafy spurge](#)

[Plumeless thistle](#)

[Poison hemlock](#)

[Rush skeletonweed](#)

[Wild chervil](#)

9.0 Appendix D Best Management Practices for Invasive Plants in Parks and Protected Areas of BC

Planning and Coordination

- Learn to identify invasive species and how to report them. Also, know how to identify native plants.
- Consult and collaborate with the regional invasive species organization to determine threats that could arise from areas adjacent to parks and protected areas.

Site Disturbance from Construction of Recreation Facilities

- Survey for invasive plants in all areas where planning site-disturbing activities. Conduct an impact assessment to record anticipated impacts. Treat all invasive plants in the project area before work begins
- Thoroughly clean equipment and machinery to remove seeds and vegetative plant material before moving to a new site.
- Carefully clean clothes, boots, hand tools, and other equipment used for treating invasive plants before leaving a site
- Ensure road, trail or campsite pad material (e.g. sand, gravel, fill, topsoil), originates from invasive plant-free pits or locations
- Maintain invasive plant-free buffer zones along roads, trails, campsites, day use areas, and other high-traffic sites
- Reseed bare soil immediately after disturbance, and when soil surface, soil moisture, and weather conditions are suitable for germination and establishment.
- Avoid using straw or hay for erosion control unless the product can be certified invasive plant-free. Monitor sites where mulches, hay or straw applications protect the soil, and eradicate emerging invasive plants immediately
- For disturbed areas, plan the composition of seed mixes to best suit each site. Composition may be entirely made up of native species if seed is available. Alternatively, non-invasive/ non-persistent agronomic species can be used where their introduction does not interfere with management objectives. Use only Canada Certified Number 1 Grade seed where possible.
- Minimize further disturbance on restoration sites as new seedlings establish.
- Conduct invasive plant surveys for one and three years after completion of all projects that create disturbance or implement restoration treatments

Ecosystem Restoration and/or Vegetation Management

- Prior to any work, conduct an impact assessment that includes invasive plant mitigation
- Inspect all sites for invasive plant presence before implementation of prescribed treatments.
- Eradicate invasive plant species before carrying out vegetation management treatments. Consider not applying treatments on areas where invasive plants are established and where plant density may increase as a result of the proposed management activity.
- Retain natural regeneration and understory vegetation in areas where management activities could affect the cover, density, and species composition of the native plant community
- Include provisions for invasive plant prevention and ecosystem restoration in contracts and management plans that will result in soil and vegetation disturbance
- Continue to monitor disturbed sites for 5-10 years following major restoration projects.

Wildlife and Domestic Animals

- Encourage ranchers to inspect livestock for invasive plant seeds and plant parts before livestock enter protected lands where grazing is permitted.
- Avoid grazing invasive-plant-infested pastures during the period when plants are setting seed
- Regularly inspect habitats where wildlife congregates, such as winter and spring ranges, for invasive plants

Recreation and Wilderness Areas

- Monitor trails within parks and protected areas to ensure horseback riding, mountain biking, and hiking are confined to trails. Inspect disturbed areas adjacent to trails for invasive plants and encourage native vegetation recovery on disturbed sites
- Inspect and clean all boots, bikes, gear, camping equipment and motorized vehicles for invasive plant seeds and parts before leaving a recreational area.
- Provide invasive plant identification information at trailheads, campsites and parks and protected areas entrances. Encourage users to report sightings of invasive plants
- Inspect and monitor all areas where people and animals congregate, such as trailheads, parking lots, campsites, day use areas, boat launches, beaches, and maintenance compounds.

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