

Kinǰuǰanki Columbia Lake East Area Invasive Plant Management

Final Report 2024



Ministry of
Water, Land and
Resource Stewardship



NATURE TRUST
BRITISH COLUMBIA



Prepared for: The Nature Trust of British Columbia
500-888 Dunsmuir St., Vancouver BC
V6C 3K4

Prepared by: East Kootenay Invasive Species Council
1902 Theatre Road, Cranbrook, BC
V1C 7G1

Contract No.: 2024-103-KR
March 26, 2024



Contents

Introduction	3
Project Area	3
Deliverables	5
Invasive Plant Inventory.....	5
Treatment Summary	9
Grass seeding.....	12
Long-term Monitoring Plots.....	12
Monitoring Summary.....	12
Invasive BC Database	13
Appendix A: Deliverables completed by EKISC in the Kin̓qu̓q̓anki East Side Columbia Lake Conservation Area in 2024.....	14
Appendix B. Invasive Plant Inventory Methods	16



List of Figures

Figure 1. Kin̓uq̓anki East Side Columbia Lake Conservation Area, including Ministry of Water, Land, and Resource Stewardship’s East Side Columbia Lake Wildlife Management Area, BC Park’s Columbia Lake Provincial Park, Nature Conservancy of Canada’s Lot 48 Conservation Area, Nature Trust of BC’s Columbia Lake Eastside Conservation Complex, BC Park’s Columbia Lake Ecological Reserve and Mount Sabine Ecological Reserve, as well as Village of Canal Flats municipal boundary. 4

Figure 2. Invasive plant distributions across the Kin̓uq̓anki East Side Columbia Lake Conservation Area, collected in 2024..... 7

Figure 3. Invasive plant treatments in the Kin̓uq̓anki East Side Columbia Lake Conservation Area completed in 2024. 10

List of Tables

Table 1. Overview of all invasive species detected in the Kin̓uq̓anki East Side Columbia Lake Conservation Area, and the corresponding area covered by each species. 8

Table 2. Invasive species treatment overview for each conservation area within the Kin̓uq̓anki East Side of Columbia Lake Conservation Area. 11



Introduction

The East Kootenay Invasive Species Council (EKISC) is a regional non-profit organization that strives to mitigate the negative environmental, social, and economic impacts of invasive species within the East Kootenay Region. Part of this work includes coordinating the inventory and treatment of invasive species on different land jurisdictions and fostering increased support for invasive species management. As such, EKISC worked with the Nature Trust of British Columbia (NTBC), the Ministry of Water, Land, and Resource Stewardship (WLRS), the Nature Conservancy of Canada (NCC), and the Ktunaxa Nation Council (KNC) to conduct invasive plant management in the Kin̓qu̓q̓anki East Side Columbia Lake, with a specific focus of the conserved and protected areas located there. The following report will detail all invasive plant management activities undertaken in 2024.

Project Area

Kin̓qu̓q̓anki East Side Columbia Lake (“Kin̓qu̓q̓anki”) is situated on the traditional lands of the Ktunaxa Peoples and, extends across the entire east side of Columbia Lake. It encompasses over 7,000 ha of land on the east side of Columbia Lake, beginning in the Village of Canal Flats and spanning north to the southern outskirts of the unincorporated community of Fairmont Hot Springs. The western boundary starts at the lake surface, at approximately 808 m elevation, and extends east to the height of land, at approximately 2613 m elevation.

Kin̓qu̓q̓anki encompasses a variety of conserved and protected lands managed by multiple partners (Figure 1). The East Side Columbia Lake Wildlife Management Area (WMA), which falls under the jurisdiction of WLRS and managed in collaboration with KNC, forms most of the conservation area. Some areas of NTBC’s Columbia Lake East Side Conservation Complex are located within the WMA, while others are adjacent to it. The WMA also includes the Columbia Lake Ecological Reserve and Mount Sabine Ecological Reserve, both managed by BC Parks. On the northern border of the WMA, are the NCC’s Lot 48 Conservation Area and Columbia Lake Provincial Park, as well as NTBC’s Columbia Lake North Wetlands Conservation Area. All individual conserved and protected areas, managed by different partners, comprise Kin̓qu̓q̓anki.

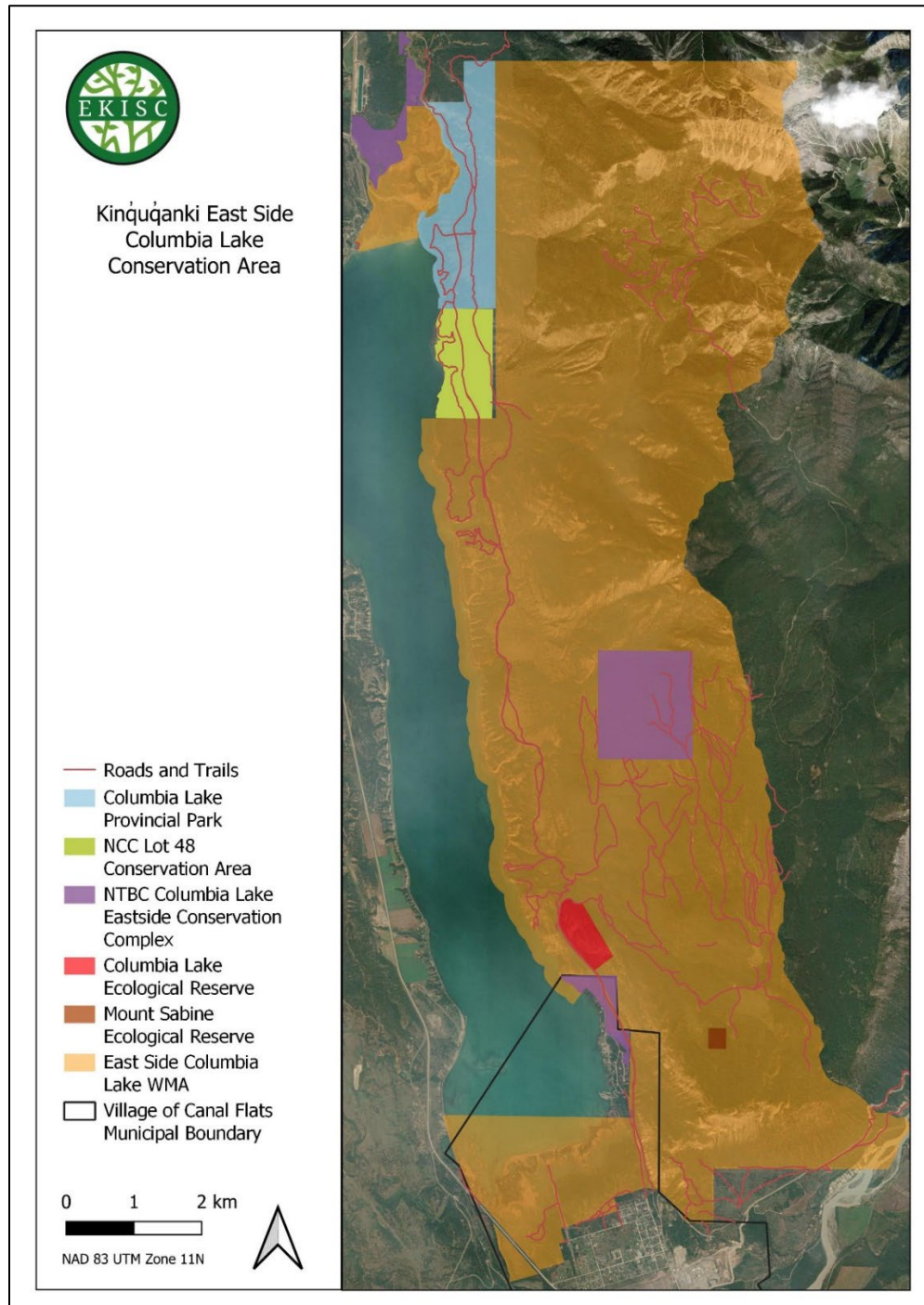


Figure 1. Kin̓q̓q̓anki East Side Columbia Lake Conservation Area, including Ministry of Water, Land, and Resource Stewardship’s East Side Columbia Lake Wildlife Management Area, BC Park’s Columbia Lake Provincial Park, Nature Conservancy of Canada’s Lot 48 Conservation Area, Nature Trust of BC’s Columbia Lake Eastside Conservation Complex, Nature Trust of BC’s Columbia Lake North Conservation Area, BC Park’s Columbia Lake Ecological Reserve and Mount Sabine Ecological Reserve, as well as Village of Canal Flats municipal boundary.



Deliverables

This section outlines the key deliverables as specified in the contract. The following sections will detail each invasive plant management activity undertaken in the project area. Additionally, an overview of each deliverable and how it was completed is included in Appendix A. EKISC committed to the following deliverables:

- 1) Target area of interest is approximately 7,000 ha with an inventory expected for 25km of linear corridors and a treatment footprint of 0.19 ha (estimate).
- 2) Priority areas within the complex will be inventoried for invasive plants using EKISC protocol for assessing large landscapes focussing on linear corridors.
- 3) Chemical and/or mechanical treatments will be completed for priority invasive plants as funding allows.
- 4) Seeding (from a seed blend approved by the WLRS) may happen in areas of disturbed or bare ground, or areas that have received invasive plant management activities, if required.
- 5) Priority invasive species for inventory and treatment may include but are not limited to: Blueweed, Spotted, Knapweed, Leafy Spurge, Dalmatian Toadflax, Scentless Chamomile, yellow Hawkweed, orange Hawkweed, Hounds Tongue, Burdock, Common Tansey, Teasel, Black Hen Bane, perennial pepper weed, Chicory, Sulfur cinquefoil, Downy brome, and other priority species include those found within EKISC priority species lists for Invasive Plant Management Area (IPMA) 04.
- 6) Within the confines of the budget and timing windows, establish 2-4 long-term monitoring plots across the area to measure effectiveness of treatments in the future. This will be accomplished using an established protocol previously used by MWLRS and EKISC.
- 7) Monitor at random, a minimum of 10% of invasive plant treatments for efficacy and site completion using EKISC established protocol. Monitoring will also observe adherence to the relevant provincial Pest Management Plan and relevant legislation and regulations.
- 8) Input all inventory and treatment data into the BC Provincial Government's Invasive BC database and provide an extract of this information along with the final report.
- 9) Delivery of final report summarizing invasive plant planning and implementation efforts. Reporting will include the spatial data, maps, treatment extracts, monitoring results and related photos and/or video.
- 10) Research, compilation, writing and completion of an Invasive Species Management Plan (ISMP) that will provide strategic direction for management across the area of interest for the short-medium term.

Invasive Plant Inventory

In 2024, an invasive plant inventory was conducted in conservation areas on Kin̓úq̓anki to collect invasive plant data to inform the development of the ISMP and to provide a baseline for monitoring the impacts of invasive species management (Figure 2). The inventory focused on vectors of spread, specifically roads, trails, and disturbed areas. Additionally, the shoreline and wetland habitats were surveyed for invasive species. Approximately, 50 km of linear corridors were inventoried in the conservation area, not including the area travelled by kayak during the shoreline surveys. All conservation areas were surveyed except for NTBC's Columbia Lake North area and BC Parks Mount Sabine Ecological Reserve. Methods and additional information about the invasive plant inventory can be found in Appendix B. The following noxious invasive species were documented during the 2024 inventory:



- Baby's breath (*Gypsophila paniculata*)
- Bull thistle (*Cirsium vulgare*)
- Canada thistle (*Cirsium arvense*)
- Cheatgrass / downy brome (*Bromus tectorum*)
- Common tansy (*Tanacetum vulgare*)
- Diffuse knapweed (*Centaurea diffusa*)
- Russian thistle (*Salsola tragus*)
- Mullein (*Verbascum thapsus*)
- Oxeye daisy (*Leucanthemum vulgare*)
- Spotted knapweed (*Centaurea stoebe / biebersteinii*)
- St. John's-wort (*Hypericum perforatum*)
- Yellow hawkweed species (*Hieracium / Pilosella* spp.)
- Yellow/common toadflax (*Linaria vulgaris*)

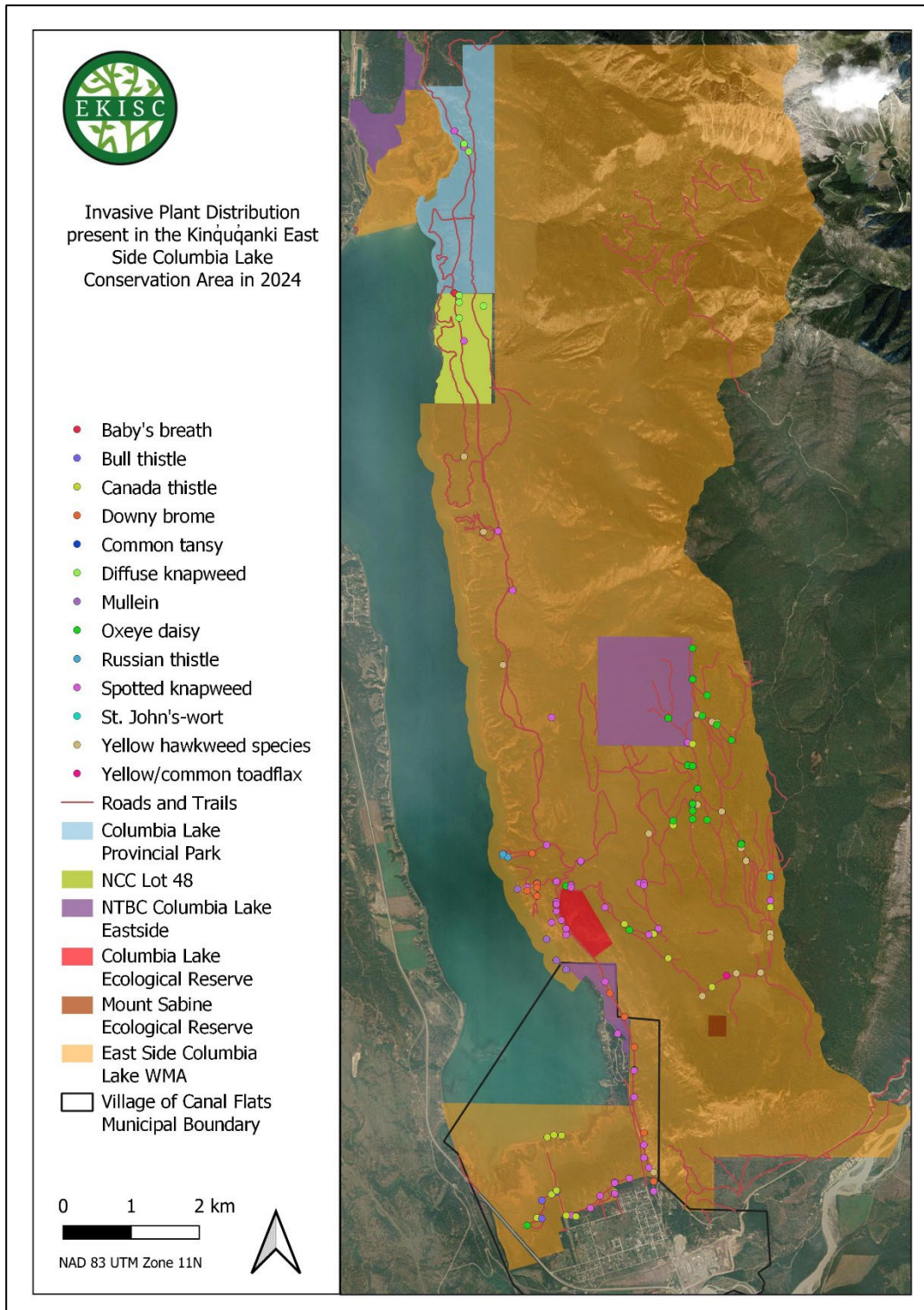


Figure 2. Invasive plant distributions across the Kin̄quq̄anki East Side Columbia Lake , collected in 2024.



A total of 174 infestations were recorded during the inventory, accounting for 10 documented invasive species (Table 1). Most of the documented sites were located in the WMA, which occupies the largest footprint across the landbase. Several species found during the inventory had not been previously documented, specifically bull thistle, downy brome, common tansy, Russian thistle, mullein, St. John's-wort, and common toadflax. However, it is likely that the lower priority species, such as mullein and bull thistle, have been present in the conservation area complex for quite some time. Common tansy, Russian thistle, St. John's-wort, and common toadflax have low densities and distributions and may have only recently entered the conservation area. The single St. John's wort and yellow toadflax sites plant were found in the upper reaches of the Camp 1 FSR, while the common tansy site is within the municipal boundary of the Village of Canal Flats. Several patches of Russian thistle were found close to the shoreline which showed significant signs of motor vehicle use.

Table 1. Overview of all invasive species detected in the Kinꞗuꞗanki and the corresponding area covered by each species.

Invasive Plant	Infestation Count	Area (ha)
Baby's breath	1	0.0001
Bull thistle	6	0.20
Canada thistle	26	0.97
Cheatgrass / downy brome	14	8.83
Common tansy	1	0.001
Diffuse knapweed	6	0.72
Russian thistle	4	0.08
Mullein	4	0.001
Oxeye daisy	27	2.13
Spotted knapweed	58	2.17
St. John's-wort	1	0.03
Yellow hawkweed species	26	0.25
Yellow/common toadflax	1	0.00
Total:	175	15.38

The most abundant species found in the conservation area was spotted knapweed, with 58 isolated infestations detected. Spotted knapweed was in highest densities around Canal Flats and on the main access road into the WMA, Camp 1 FSR. Infestations have moved from the roadside onto the steep gravel banks upslope from the road. Less dense, discrete infestations were documented across the WMA, primarily associated with the legacy forestry and ranching road network.

Downy brome (cheatgrass) covers the most area of the conservation area complex, at 8.83 ha, although less sites were detected than spotted knapweed. The largest continuous distribution of downy brome was documented on the steep scree slope above the Camp 1 FSR. Downy brome was only found in lower elevation in open grassland areas. This species is unregulated in British Columbia and is not typically treated on public lands, however there is growing concern over its ability to dominate grasslands. A suitable herbicide has not yet been approved for use in Canada, though a product is being used with good success against Downy brome in the United States.



Yellow hawkweed species were typically found in higher densities and distributions in the high elevation areas along forest service roads and open landings. A few patches are present in low elevation areas, but these were small, isolated infestations. Yellow hawkweed species were often found in conjunction with oxeye daisy, Canada thistle, and bull thistle on open landings.

Diffuse knapweed was only detected in Columbia Lake Provincial Park and Lot 48, with significant densities recorded along Columbia River Drive. This access road into the park has extensive pesticide-free zones that do not receive chemical treatment. As a result, large infestations of diffuse knapweed, as well as spotted knapweed, are present along the road leading into the park and Lot 48. Baby's breath was detected in NCC's Lot 48, close to the boundary with Columbia Lake Provincial Park. This species has been previously documented and treated in the Provincial Park, but not in Lot 48. This is an indication that this species has been spreading within the northern area of the conservation area.

Treatment Summary

In 2024, chemical treatments took place in the Kinǰuǰanki on July 9 & 10, September 8 & 30, and October 1, 17, & 18, by EKISC's Certified Pesticide Applicator Rob Chemelli (RMC Enterprises Ltd.). Species targeted included: diffuse knapweed, spotted knapweed, St. John's wort, and yellow hawkweed species, covering 1.07 ha across all conservation areas (Figure 3). Treatments took place in each individual conservation area, covering 0.875ha in the WMA, 0.065 ha in NTBC's Columbia Lake East Conservation Complex, 0.07 ha in NCC's Lot 48 Conservation Area, and 0.069 ha in BC Park's Columbia Lake Provincial Park. Table 2 provides an overview of all treatments conducted across Kinǰuǰanki.

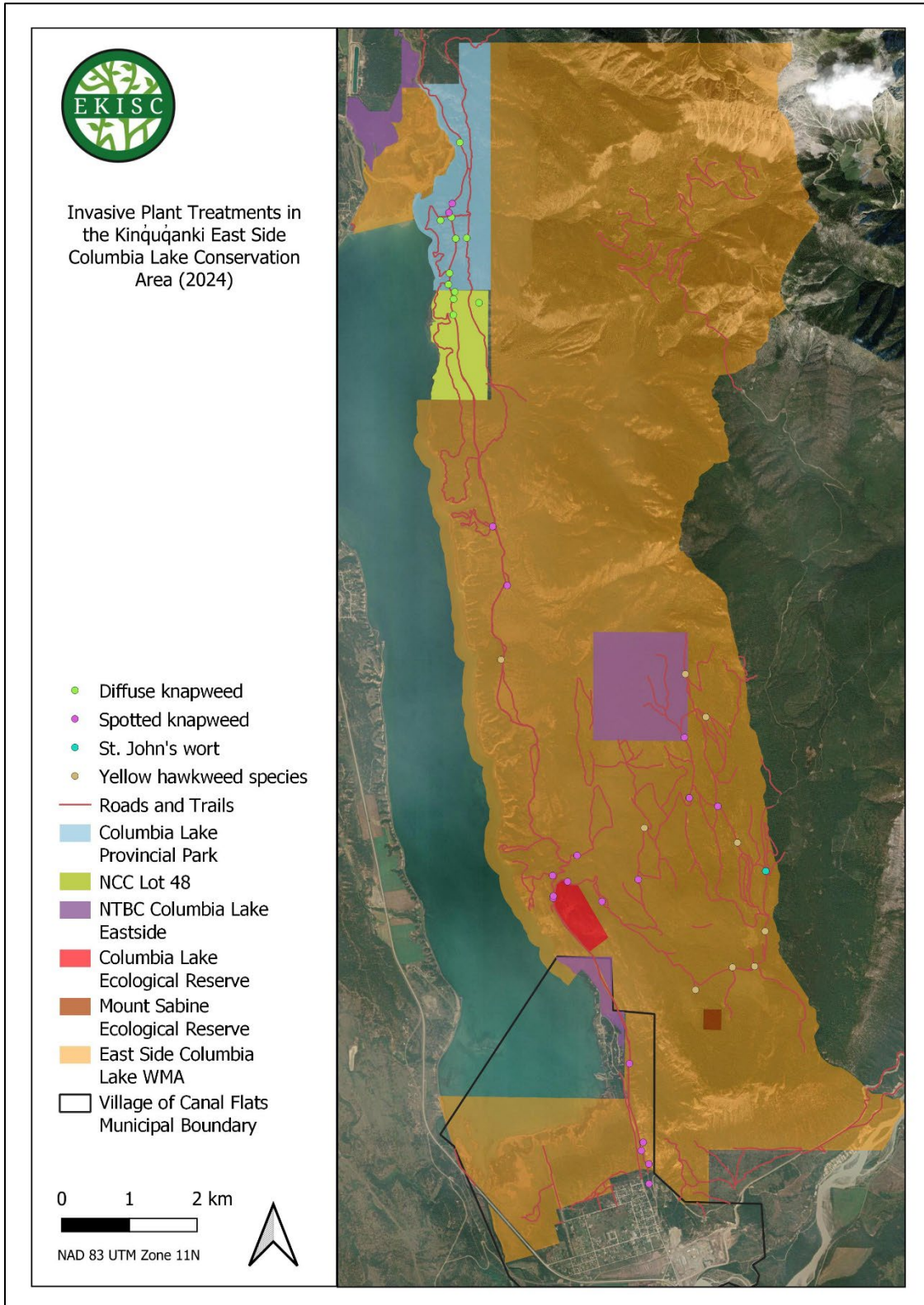


Figure 3. Invasive plant treatments at Kinꞗuꞗanki completed in 2024.



Table 2. Invasive species treatment overview for each conservation area within the Kinquqanki East Side of Columbia Lake Conservation Area.

Conservation Area	Species Targeted	Herbicide used	Treatment Method	Undiluted herbicide used	Treatment sites	Area treated (ha)
East Side Columbia Lake Wildlife Management Area	Spotted knapweed	Milestone	Hand gun, boomless nozzle, backpack	0.29 L	10	0.59
		Clearview	Hand gun, boomless nozzle	0.01 kg	9	0.06
	St. John's wort	Clearview	Boomless Nozzle	0.0003 kg	1	0.002
	yellow hawkweed species	Milestone	Hand gun	0.001 L	1	0.003
		Clearview	Boomless nozzle	0.04 kg	10	0.22
Nature Trust of BC's Columbia Lake East Conservation Complex	Spotted knapweed	Clearview	Boomless nozzle	0.007 kg	1	0.04
	yellow hawkweed species	Clearview	Boomless nozzle	0.004 kg	1	0.025
Nature Conservancy of Canada Lot 48 Conservation Area	Diffuse Knapweed	Milestone	Hand gun, boomless nozzle	0.03 L	4	0.07
BC Park's Columbia Lake Provincial Park	Diffuse knapweed	Milestone	Hand gun, boomless nozzle	0.032 L	8	0.06
	Spotted knapweed	Milestone	Hand gun, boomless nozzle	0.004 L	3	0.009
Total:					48	1.07

The treatment priorities for each conservation area were determined individually by the relevant project partner/land manager. Following the completion and implementation of the ISMP in 2025, treatment priorities should be aligned across all areas in the Kinquqanki Conservation Area instead of some current discrepancies. Treatments in the Columbia Lake Provincial Park and Lot 48 Conservation area continued from the previous year. EKISC's herbicide contractor coordinates treatments in these areas for greater efficiencies and cost sharing. In 2024, treatments were conducted on September 30 and October 1, focusing on diffuse knapweed and spotted knapweed present along Columbia River Drive, as well as weeds in the old rock quarry area of Lot 48. Baby's breath was previously treated in the Provincial Park, but no plants were detected in 2024. Although one plant was detected in Lot 48 during the invasive plant inventory, this was not treated. It is possible that it was not found by EKISC's herbicide contractor.



Additionally, EKISC and Wildsight Invermere, in partnership with BC Parks, hosted a community weed pull at Columbia Lake Provincial Park on May 25, 2024. Volunteers targeted diffuse knapweed and spotted knapweed in the pesticide free zones along Columbia River Drive and parking area. A total of six bags of invasives were removed during this weed pull. Later in the fall, when the contractor came back to treat, he continued treatments on areas that were pulled to address any regrowth. The contractor made note that the weed pull in the PFZ zone was very effective and it would be great to continue in the future.

Treatments in the WMA and NTBC's Columbia Lake East Conservation Complex continued from the previous year. Initial treatments took place on July 9 & 10 and September 8, 2024. Treatment of spotted knapweed was focused on Camp 1 FSR and the broadcast tower, with smaller, isolated infestations in higher elevation areas also receiving treatment. Yellow hawkweed was treated primarily along the road network extending from Camp 1 FSR into higher elevation areas of the WMA and NTBC's Conservation Area. A single St. John's wort patch was detected and treated; a species previously not found in the WMA. Additional backpack treatments took place on October 17 & 18, targeting spotted knapweed that has extended from Camp 1 FSR up into the scree slope.

Grass seeding

No grass seeding took place in across the protected and conserved areas across Kin̓quq̓anki in 2024. Development of an area specific seed blend should be a priority to allow for seeding to take place in Fall 2025. Areas of mechanical control should be prioritized for seeding, along with additional areas of bare ground noted by EKISC and project partner staff members.

Long-term Monitoring Plots

No long-term monitoring plots were installed across Kin̓quq̓anki in 2024. In 2025, plots should be established in high-density infestations and species with lower distributions. Suggestions for suitable areas would be the Russian thistle infestation, the common tansy infestation, high density spotted knapweed in the village of Canal Flats, high density spotted knapweed along Camp 1 FSR, baby's breath infestation in Lot 48, diffuse knapweed in pesticide free zones in Columbia Lake Provincial Park, and an easily accessed yellow hawkweed infestation. Installing plots that capture a diversity of species and treatment types (mechanical and chemical) will provide comprehensive data on the impact of invasive species management.

Monitoring Summary

EKISC conducted post-treatment monitoring in the East Side Columbia Lake WMA on July 29 (during the invasive plant inventory) and October 8 2024. Sites were monitored for treatment efficacy and site completion, as well as correct herbicide signage and PFZ flagging, if applicable. A total of 12% of treatments were monitored in the WMA (4 out of 33 treatments). However, this accounted for only 8% of the treatments monitored across Kin̓quq̓anki, as no treatments were monitored in BC Parks' Columbia Lake Provincial Park or NCC's Lot 48 due to a later treatment date. These conservation areas will be prioritized for monitoring in 2025. Monitoring during the invasive plant inventory and discussions between EKISC and WLRS staff resulted in backpack treatments taking place on the scree slope above Camp 1 FSR. These treatments, completed on October 17 & 18, were not conducted as a follow-up, but rather to expand the treated area and address the concern of spotted knapweed spread in difficult to access areas. All monitored sites were spotted knapweed treatments along Camp 1 FSR, these records



all scored 9/10 for efficacy and 10/10 for completion. In 2025, EKISC will expand monitoring to additional species and conservation areas within Kin̓qu̓anki.

Invasive BC Database

All treatment and inventory data was uploaded to the Invasive BC database prior to the deadline. All data can be accessed and viewed in the database.



Appendix A: Deliverables completed by EKISC across Kinꞗuꞗanki in 2024.

Deliverable	Activity	Completed (Y/N)
1) Target area of interest is approximately 7,000 ha with an inventory expected for 25km of linear corridors and a treatment footprint of 0.19 ha (estimate).	Inventoried linear area = 50 km (not included area travelled by kayak during shoreline surveys) Treated area = 1.07 ha	Y
2) Priority areas within the complex will be inventoried for invasive plants using EKISC protocol for assessing large landscapes focussing on linear corridors.	Inventory completed by EKISC, WLRS, and Wildsight staff members.	Y
3) Chemical and/or mechanical treatments will be completed for priority invasive plants as funding allows.	Chemical treatments completed by Certified Pesticide Applicator Rob Chemelli (RMC Enterprises), covering 1.07 ha across protected and conserved areas.	Y
4) Seeding (from a seed blend approved by the WLRS) may happen in areas of disturbed or bare ground, or areas that have received invasive plant management activities, if required.	No seeding took place in 2024.	N
5) Priority invasive species for inventory and treatment may include but are not limited to: Blueweed, Spotted, Knapweed, Leafy Spurge, Dalmatian Toadflax, Scentless Chamomile, yellow Hawkweed, orange Hawkweed, Hounds Tongue, Burdock, Common Tansey, Teasel, Black Hen Bane, perennial pepper weed, Chicory, Sulfur cinquefoil, Downy brome, and other priority species include those found within EKISC priority species lists for Invasive Plant Management Area 04.	Species inventoried included: baby's breath, bull thistle, Canada thistle, downy brome, common tansy, diffuse knapweed, Russian thistle, mullein, oxeye daisy, spotted knapweed, St. John's-wort, yellow hawkweed species, yellow toadflax. Species treated included: diffuse knapweed, spotted knapweed, St. John's wort, yellow hawkweed across all conservation areas in the Kinꞗuꞗanki East Side Columbia Lake Conservation Area.	Y
6) Within the confines of the budget and timing windows, establish 2-4 long-term monitoring plots across the area to measure effectiveness of treatments in the future. This will be accomplished using an established protocol previously used by MWLRS and EKISC.	No long-term monitoring plots were installed in the conservation area in 2024.	N
7) Monitor at random, a minimum of 10% of invasive plant treatments for efficacy and site completion using EKISC established protocol. Monitoring will also observe adherence to the relevant	A total of 8% of treatments were monitored in the Kinꞗuꞗanki East Side Columbia Lake Conservation Area (12% in the WMA).	Y



provincial Pest Management Plan and relevant legislation and regulations.		
8) Input all inventory and treatment data into the BC Provincial Government's Invasive BC database and provide an extract of this information along with the final report.	All treatment and inventory data was uploaded to the Invasive BC database prior to the deadline.	Y
9) Delivery of final report summarizing invasive plant planning and implementation efforts. Reporting will include the spatial data, maps, treatment extracts, monitoring results and related photos and/or video.	Final report submitted with spatial data, maps, treatment extracts, monitoring results and related photos.	Y
10) Research, compilation, writing and completion of an Invasive Species Management Plan (ISMP) that will provide strategic direction for management across the area of interest for the short-medium term.	Invasive species management plan currently in draft/interim stage.	N



Appendix B. Invasive Plant Inventory Methods

EKISC conducted an invasive plant inventory in the East Side Columbia Lake on July 29, 30, & 31, 2024. The inventory was completed with the use of e-bikes, to efficiently travel the road and trail network within the WMA. WLRS staff members accompanied EKISC staff on July 29 to clarify inventory objectives and provide a background on the conservation area. In addition, a shoreline survey was conducted on a kayak by Tracy Flynn of Wildsight to record invasive species found along the shoreline and wetlands of the conservation area. The shoreline from Armstrong Bay north to the wetland was not surveyed due to time constraints. The objective of the inventory was to collect invasive plant data to inform the development of this ISMP and to provide a baseline for monitoring the impacts of invasive species management.

EKISC staff recorded invasive plant species, locations, infestation sizes, densities, distributions, and provided additional comments when necessary, using a standardized inventory record template on GIS Pro. Polygon data was collected to document where infestations were continuous over large distances or very dense, and linear segment data was collected to demonstrate linear infestations. Areas that are considered high vectors of spread (i.e., roads, trails, and disturbed areas) were the focus of the invasive plant inventory to efficiently cover the entire conservation area. Species that are listed as noxious under the *B.C. Weed Control Act* are prioritized in the inventory, as they are provincially legislated for control.

EKISC inventories are guided by the *East Kootenay Priority Species by Invasive Plant Management Area (IPMA)* list. The conservation area is located in IPMA 04. This list is updated annually to ensure all relevant species are managed at their appropriate response level. The lists categorize all species into Priorities 1-5; with 1 being the highest priority species, and 5 being lowest priority or a data-deficient species. Priorities for the East Kootenay region are generated using a combination of information from applicable Provincial legislation, local land manager priorities, and guidance provided by the Provincial Invasive Plant Specialist.

In addition to the priority species lists, B.C.'s Invasive Species Early Detection Rapid Response Plan provides a guiding framework for the detection and reporting of high-risk species. Early detection and rapid response (EDRR) is a procedure that addresses the threat of newly introduced species and works to systematically eradicate or control invasive species before establishment. The updated list of provincial EDRR species was used as a guide during the inventory to ascertain that no high-risk species were present.