



BUMMERS FLATS FLOODPLAIN AND WETLAND HABITAT RESTORATION

(COL-F25-W-4030)

Prepared for:
Fish & Wildlife Compensation Program

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1. EXECUTIVE SUMMARY

This report summarizes the accomplishments of year one of a five-year floodplain restoration project in the East Kootenays at Bummers Flats. This multi-year project aims to restore up to 270 ha of wetland habitat along the Kootenay River. It is a collaborative project between Ducks Unlimited Canada (DUC), ʔaąam, The Nature Trust of BC (NTBC), and the Ministry of Water, Lands, and Resource Stewardship (WLRS).

The Priority Action of this project is to restore and create wetland/riparian habitat at Bummers Flats, an engineered wetland complex north of Fort Steele, British Columbia. In Year 1 of the project, DUC and partners completed project initiation and preliminary research and planning, as well as started baseline monitoring, elevation surveys, conceptual design plans, river modelling, archaeological work, and Indigenous engagement. Water Sustainability Act (WSA) amendments were submitted to Water, Land and Resource Stewardship (WLRS) in October 2024 for North Bummers, one of three segments in the wetland complex. The team is on progress to begin construction in fall of 2025 at North Bummers, pending WSA and other permits.

A major accomplishment of the project in year 1 was the extensive engagement work and relationship building that occurred between DUC, NTBC, WLRS and ʔaąam. ʔaąam hosted two engagement days, one field tour and one workshop. At each event, 10-25 band members participated, including elders and youth. DUC also delivered presentations to the Band (Band Meeting), Lands Committee, Language Speakers and Knowledge Holders Committee, Chief and Council. Further, DUC employed two ʔaąam band members for six months to support environmental monitoring and Indigenous Knowledge and Language Revitalization.

The extensive planning and engagement that has occurred over the past year has resulted in project readiness to move to year two of the project, which will comprise restoration in North Bummers and planning and design work at Middle Bummers.

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1. INTRODUCTION

Bummers Flats Conservation Complex was formerly a natural floodplain along the east bank of the Kootenay River. The area is important to First Nations peoples. Between 1972 and 1986, Ducks Unlimited Canada (DUC) created a series of engineered wetlands operated by dikes, control structures, ditches, diversion points, borrow pits, nesting islands and electrical pumps. The projects aimed to eliminate natural flooding and to stabilize water levels for breeding and nesting waterfowl and to provide open water for spring and fall migration.

North Bummers Conservation Area was secured in 1985 by a fee-simple purchase by NTBC and DUC that is leased back to the Province of British Columbia, while Middle and South Bummers are Crown-owned Conservation Lands. DUC constructed South Bummers in 1972, Middle Bummers in 1975 and North Bummers in 1986. The areas under agreement between The Province and DUC, which includes both wetland and upland habitats, comprise 114 hectares at South Bummers, 243 ha at Middle Bummers and 265 ha at North Bummers. Several water licenses are associated with the projects.

Despite best intentions, these projects have altered natural processes and functions, modified habitats and changed community composition throughout the floodplain. Diking the floodplain has resulted in the elimination of the floodplain-river connection and deprived the marsh of key processes such as sediment and carbon deposition and storage. Without dynamic processes and interactions between the river and its floodplain, open water at Bummers Flats has likely decreased over time and has been overtaken by monocultures of Reed Canary Grass and Bullrush. The site is also potentially drying out due to seepage through and under the dikes, and into ditches and borrow pits. These problems, along with climate change, are converting habitat in the floodplain to less diverse and drier community types.

Diking floodplains also has negative in-stream effects. Isolating a river from its floodplain causes river channelization, which in turn can increase flow velocity, sheer stress, erosion, downstream sedimentation and downstream flooding. Operational management of the pumps may also put pressure on aquatic in-stream habitat if pumping occurs during low flow periods (e.g. spring and fall).

Thus, like dikes across North America, the infrastructure and operational management of Bummers Flats has negatively impacted river processes and floodplain characteristics despite best intentions of the time. Floodplain services such as carbon sequestration and storage, however, can be turned back on through restoration.

In 2022, DUC, NTBC, ʔaąam, and WLRS (The Conservation Partners) began conversations to naturalize Bummers Flats. In 2023, the parties agreed to move forward with the aim of returning Bummers Flats to a self-sustaining ecosystem with natural, dynamic river-floodplain connections and a mosaic of habitat types.

The project will re-activate natural floodplain processes and restore wildlife habitat for a broader diversity of wetland-associated species. ʔaąam and the project team share an interest in restoring and stewarding these habitats adjacent to ʔaąam's reserve lands.

1.1 Statement of Need

The Conservation Partners are prioritizing the restoration of Bummers Flats over the next several years and have committed resources to this project with the aim of restoring the floodplain back to a self-sustaining and natural state.

Rarely is contiguous habitat along a key river corridor already conserved and available for large-scale restoration. This project offers a unique opportunity to test major restoration strategies and actions to increase biodiversity and ecosystem functions of interconnected river, floodplain, wetland and associated upland habitats.

FWCP funding is critical to leverage other funders and seize the opportunity to perform large-scale floodplain restoration that can reverse the loss of floodplain and wetland habitat in southeastern BC.

2. GOALS & OBJECTIVES

The project vision is for Bummers Flats to be a functioning floodplain again, hosting diverse wetland habitats that will store water for varying periods throughout the year and restore the river-floodplain connection. The project will result in more diverse habitat for species and improved ecosystem processes and services that were lost or diminished over the past 50 to 100 years. The project team aims to complete construction between fall 2025 and 2029, applying for FWCP funding each year.

After restoration, the floodplain will contain a mosaic of natural, self-sustaining riparian and wetland habitats with varying characteristics, including size, shape, depth, hydroperiod, and plant community. The project will have long-term positive outcomes for local plant, invertebrate, and wildlife species.

The following specific priority actions are most aligned with the project:

Wetland and Riparian

- Ecosystems
 - Habitat-based Actions
 1. **COLWRA.ECO.HB.13.01 Restore and Create Wetland / Riparian Habitat – The result of this 5-year project will be approximately 270 hectares of restored wetland and riparian habitat.**

Rivers and Riparian

- Ecosystems
 - Habitat-based Actions
 2. **COLRRA.ECO.HB.15.01 Restore Riparian Vegetation and Stabilize Erosion**

Priority Action 1: Year 1 made progress towards the primary priority action to restore and create wetland and riparian habitat to address impacted, degraded or lost habitat. ʔaąam has joined the team as a project partner and is a key advisor on the project. Regular communication occurs between the team and the Lands Manager, Lands Director, Chief and Council, and other committees at ʔaąam. ʔaąam's contribution to design plans will help ensure success through incorporation of Ktunaxa Knowledge and stewardship values.

Planning activities that were completed in year 1 that will inform wetland restoration include hydraulic and river engineering modelling, elevation surveys, an archaeological study, baseline biological monitoring, and engagement workshops with community members in ʔaąam. Work also included regular

communication with the Northern Leopard Frog Recovery Team and assessment of potential habitat suitability and design characteristics that could support the re-establishment of Northern Leopard Frog, a SARA-listed species.

Priority Action 2: Year 1 also made progress towards the secondary priority action to restore riparian vegetation and stabilize erosion. After construction, detailed planting and seeding plans will be implemented to promote and restore wetland, riparian and upland vegetation. Potential erosion issues will be protected and mitigated through Best Management Practices. The project will also allow water to spread across the floodplain, re-activating processes such as sediment deposition and decreasing channel erosion such as undercutting.

3. STUDY AREA

The Bummer Flats Conservation Complex is situated along the Kootenay River approximately 12 km northwest of Fort Steele, British Columbia. The Canadian Pacific Kansas City (CPKC) rail borders Bummers Flats to the east. ʔaąam also has adjacent lands under a Certificate of Possession (IR No. 6 – Bummers Flats) in the southwest.

The entire Conservation Complex is approximately 500 ha. Historically part of the Kootenay River floodplain, the “flats” are now a series of impounded marshes along the eastern bank of the Kootenay River.

Prior to management by DUC, Nature Trust and WLRS, Bummers Flats Conservation Complex would have been an active floodplain with some upland and forested sites in the high bench areas nearest to the river. The floodplain would have had more topographic variability, with a mixed mosaic of open water pools, emergent wet meadows, and uplands. The area is important to ʔaąam, and elders remember a family living in the area now known as Bummers Flats. A ferry boat used to connect the two sides of the river between Bummers and ʔaąam reserve. In the 1800s or early 1900s, the area was homesteaded by settlers and converted for ranching. The remnants of a homesteader’s cabin and a paddock for cattle and horses still exists at North Bummers. The homesteaders used the area for grazing and likely tried to drain the lands. Management of the property after it was acquired by NTBC and DUC included cattle grazing and fire to attempt to diversify vegetation, but these management activities had limited success.

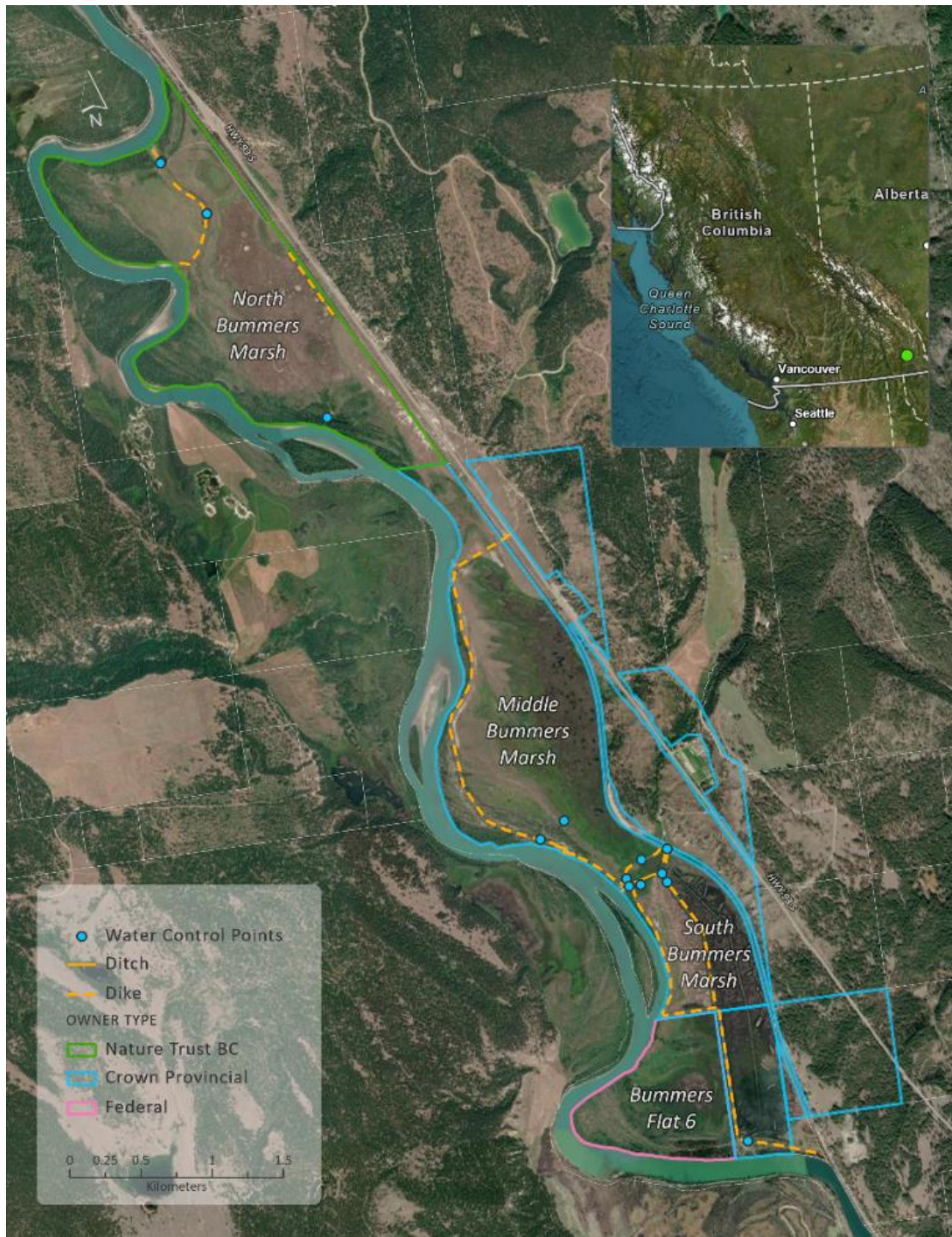


Figure 1. Bummers Flats Conservation Complex

3.1 Biophysical

North Bummers is in the very dry, very hot Interior Douglas-fir Biogeoclimatic Zone variant (IDFxx2). The IDFxx2 occupies low elevations along the valley bottom of the southern Rocky Mountain Trench. All

seasons in this subregion are characterized by very dry conditions. Winter is cool, spring is warm, summer is very hot, and fall is hot. The non-forest ecosystems in this zone provide critical habitat diversity, especially wetlands and floodplains. The IDFx2 supports some of the highest-value ungulate winter range, high-value nesting and staging areas, and a migratory corridor for many bird species that use the Columbia and Kootenay River valley-bottom wetland and riparian habitats (MacKillop et al 2018).

North Bummers is currently a complex of riparian forest, meadows, and marshes. Due to the nature of the existing project, which attempted to eliminate natural floodplain dynamics and implement water level management, the wetland impoundments are degrading, drying up and filling in with monotypic vegetation such as Reed Canary Grass (*Phalaris arundinacea*).

4. METHODS

A phased approach is being taken to restore Bummers Flats Conservation Complex, starting with North Bummers. Table 1 identifies the project objectives, performance indicators, tasks, actions, progress to date and related details that are intended to address the effectiveness of the restoration actions. Monitoring will be conducted primarily by DUC and the Conservation Partners with support from local contractors and consultants. The plan consists of a baseline assessment and post-implementation monitoring. The overall project has been divided into three phases: pre- and post-restoration monitoring at North Bummers, Middle Bummers, and South Bummers.

Table 1. Monitoring schedule at Bummers Flats Conservation Complex.

Project Phase	2024	2025	2026	2027	2028	2029	2030	2031
North Bummers Baseline Monitoring								
North Bummers Post-Restoration Monitoring								
Middle Bummers Baseline Monitoring								
Middle Bummers Post-Restoration Monitoring								
South Bummers Baseline Monitoring								
South Bummers Post-Restoration Monitoring								

Biological baseline surveys were conducted at North Bummers in 2024 and monitoring will continue in 2025 at Middle Bummers. Baseline surveys consisted of the following:

- Water Level Monitoring (HOBO Loggers)

- Wetland Community Classification
- Drone Imagery Photo & Video Monitoring
- Autonomous Recording Unit (ARU) Surveys for Birds and Amphibians
- Wildlife Trail Camera Monitoring
- Waterfowl Surveys

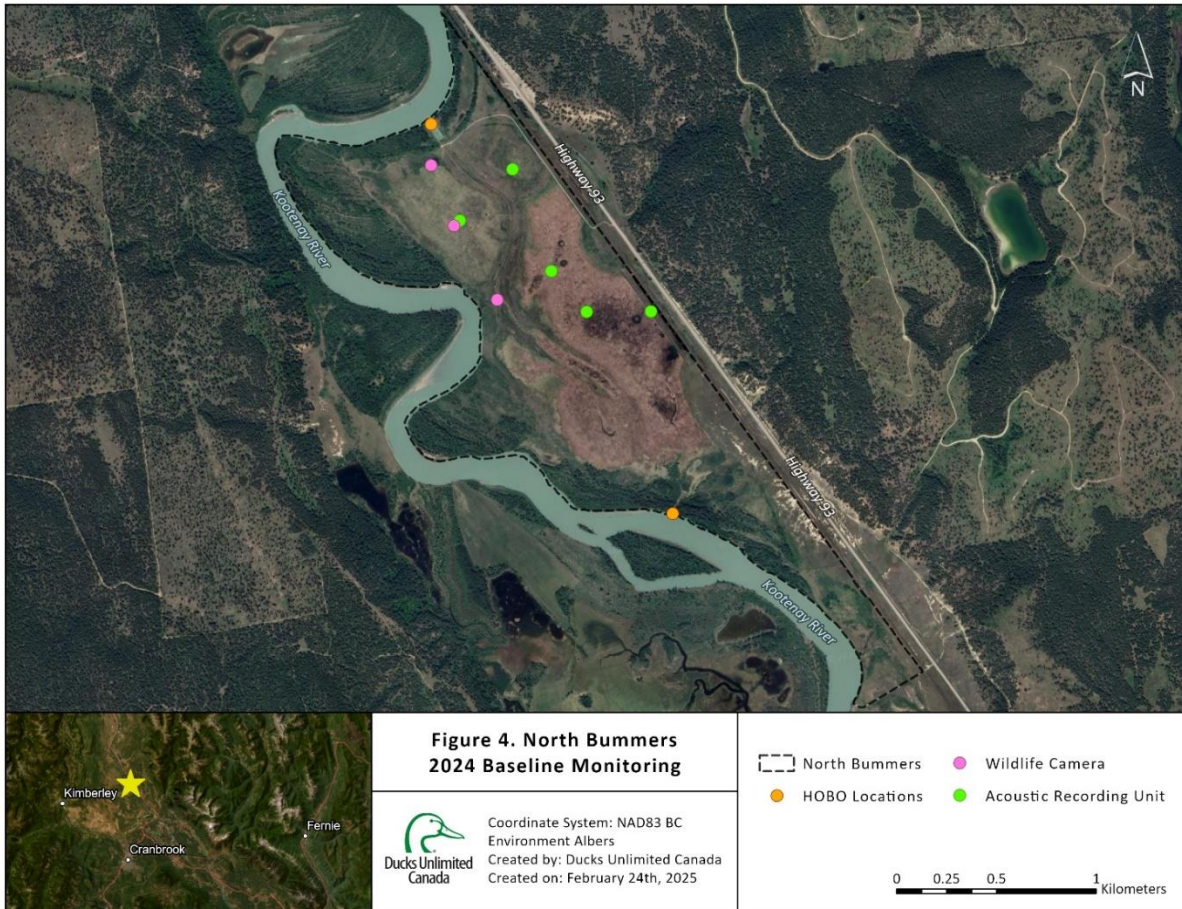


Figure 2. North Bumpers 2024 Baseline Monitoring

4.1 Vegetation

North Bumpers was initially mapped into wetland and non-wetland polygons by NTBC. To field verify this mapping and classify the wetlands further, biologists completed vegetation surveys within the mapped polygons and within each wetland type. Data collected at each plot included vegetation composition, soil cores, information on the hydrology of the site, a 360-degree photo and aerial photos.

4.2 Hydraulic River Modelling, Bathymetry and other Water Monitoring

The proposed project is considering risks upstream and downstream to adjacent landowners, most prominently the CPKC railway and the Certificate of Possession holder of IR6. A full hydraulic study, which includes bathymetry, hydraulic river modelling, flood frequency modelling, and geomorphology, is being prepared by Kerr Wood Leidel. The final report is expected before the end of July, 2025.

Kootenay River surface water levels were recorded by installing 3 HOBO water level loggers at the current inlet and outlet of North Bummers and near the inlet of South Bummers. Loggers were installed in the spring and removed in the fall before freeze-up. Each logger collected continuous water level data that was used by KWL in their hydrologic modelling.

Water monitoring will be conducted by drone flights. Imagery of North Bummers was shot during freshet as well as later in the summer and fall to record baseline open water area throughout the marsh. Changes in open water area will be quantified by comparing pre- and post-construction images.

4.3 Birds and Amphibians

Four Autonomous Recording Units (ARU) were deployed at North Bummers from April to mid-summer to detect amphibians and songbirds. The ARUs were positioned and programmed following the Canadian Wildlife Service, Environment and Climate Change Canada, and British Columbia Marsh Monitoring Program protocols. One sample is equal to 2 ARUs, which are randomly placed within a 600 m² survey area at least 200 m apart. Each ARU was programmed to record 5 minutes of every half hour between 8 pm and 9 am.

One additional ARU was deployed directly at the North Bummers 'calling ditch' where Northern Leopard Frogs (NLFR) were found in past years. NLFRs have not been detected at Bummers since 2018.

4.4 Wildlife and Fish

Three trail cameras were installed within North Bummers to capture incidental wildlife use along the dykes and within the wetlands in spring and summer. Trail cameras were installed on April 19th, 2024 and removed Sept 27th, 2024.

4.5 Species at Risk, Species of Conservation Concern, and Ecosystems at Risk

A search of existing provincial databases was conducted at North Bummers to determine species at risk, species of conservation concern, and ecosystems at risk.

4.6 Archaeology

An Archaeological Overview Assessment (AOA) and Preliminary Field Reconnaissance (PFR) were conducted by Ursus Heritage Consulting Ltd at North Bummers.

5. RESULTS AND OUTCOMES

5.1 Vegetation

A wetland inventory at North Bummers was completed by NTBC in July 2024. The assessment utilized Canadian National Wetland Inventory (CNWI) methods, which involves identifying polygons via desktop analysis. Then, field assessors conducted detailed or rapid plots within each polygon to identify the CNWI wetland class and if possible, the BC Site Association.



Figure 3. North Bummers Wetland Communities.

5.2 Water Monitoring

A sample shot of a drone image taken in 2024 (left) is shown in comparison to a flood event that overtopped the dike in 2013 (right). Flood frequency modelling indicates a 50% probability of floodplain inundation each year.



Figure 4. North Bumpers on June 13, 2024 (left, dry) and June 12, 2013 (right, inundated) in a Major Flood Year.

5.3 Birds and Amphibians

Bummers Flats is important to the Pacific Flyway in the lowlands of the Rocky Mountain Trench. When water is present, the area is used for breeding, staging and migrating purposes by a diverse range of waterbirds and songbirds.

Analysis of the ARUs detected fifty species at North Bummers Flats, which also had a Shannon Diversity index of 3.14. Bummers Flats is also a popular birding area, and many visitors record their observations on citizen science apps like eBird. North Bummers has an eBird station called “Bummers Flats – North” which has accumulated 141 checklists and 122 bird species.

Northern Leopard Frog (*Lithobates pipiens*, BC red-listed species) was re-introduced to North Bummers in 2010. However, the species has not been recorded since 2017 despite annual monitoring, about the time the north pump broke down. No amphibians were detected in 2024, confirming their absence.

5.4 Wildlife and Fish

Mammals observed over the years at North Bummers include elk, white-tailed deer, moose, black bear, coyote, muskrat, and beaver.

Only one wildlife camera lasted the entire sampling season. The other two cameras were dislodged by a fallen tree and an animal. Despite this, wildlife cameras captured elk, deer, and various raptors throughout the sampling period.



Figure 5. Elk at North Bummers

While North Bummers has no existing fish habitat values, the Kootenay River is home to a number of fish species including Brook Trout, Burbot, Kokanee, Largemouth Bass, and Rainbow Trout. According to the Kootenay River (Upper) Stream Report, Westslope Cutthroat Trout (*Oncorhynchus clarkii lewisi*, a BC blue-listed species), has not been observed in this area of the Kootenay River since 1999.

5.5 Species at Risk, Species of Conservation Concern, and Ecosystems at Risk

Multiple Species at Risk observation records have been made at North Bummers including:

- Wild Licorice (*Glycyrrhiza lepidota*)
 - SARA – N/A
 - BC List – Blue
 - Observation Source(s): iMapBC, iNaturalist, Nature Trust staff
 - Observation Date(s): 1995 - 2024
 - Location(s): sporadically located on both sides of North Bummers access road
- Western Painted Turtle (*Chrysemys picta*) (Intermountain - Rocky Mountain Population)
 - SARA – Special Concern
 - BC List – Blue
 - Observation Source(s): iMapBC
 - Observation Date(s): 2013
 - Location(s): Two observed at the northern end of Bummers Flats
- Northern Leopard Frog (*Lithobates pipiens*) (Rocky Mountain Population)
 - SARA – Endangered
 - BC List – Red
 - Observation Source(s): iMapBC
 - Observation Date(s): 2010 - 2017
 - Location(s): North Bummers 'Calling Ditch' (small wetland between dike and rail)
 - Further Details:
 - Northern Leopard Frogs (NLFR) were re-introduced to Bummers Flats from 2010 – 2015
 - Data up until 2017 prompted the reintroduction to be considered successful (ECCC, 2017), however, reproductive failure was suspected in 2018 as no calling males or young of year were observed (Ohanjanian, P. 2018)
 - From 2018 – present, no NLFR have been detected at North Bummers
 - The Upper Kootenay Floodplain (North Bummers) subpopulation is presumed to be extirpated (Government of Canada, 2021)
- Great Blue Heron (*Ardea herodias herodias*)
 - SARA – N/A
 - BC List – Blue
 - Observation Source(s): iMapBC, eBird
 - Observation Date(s): 2003, 2019
 - Location(s): North Bummers (no further details)
- Lewis's Woodpecker (*Melanerpes lewis*)
 - SARA – Threatened
 - BC List – Blue
 - Observation Source(s): eBird
 - Observation Date(s): 2018

- Location(s): North Bummers (no further details)
- Long-billed Curlew (*Numenius americanus*)
 - SARA – Special Concern
 - BC List – Yellow
 - Observation Source(s): iMapBC
 - Observation Date(s): 1971 - 2022
 - Location(s): North Bummers (no further details)
- Bank Swallow (*Riparia riparia*)
 - SARA – Threatened
 - BC List – Yellow
 - Observation Source(s): Nature Trust staff
 - Observation Date(s): 2021
 - Location(s): northwest bank of Kootenay River at North Bummers

Multiple Species at Risk Critical Habitat (identified by the Species at Risk Act) overlaps North Bummers including:

- Northern Leopard Frog (*Lithobates pipiens*) (Rocky Mountain Population)
 - SARA – Endangered
 - BC List - Red
- American Badger (*Taxidea taxus jeffersonii*)
 - SARA – Endangered
 - BC List - Red
- Lewis's Woodpecker (*Melanerpes lewis*)
 - SARA – Threatened
 - BC List – Blue

No new species at risk observations were made by the Bummers Project Team during baseline biological surveys in 2024.

There is one ecosystem at risk record located at North Bummers.

- Nuttall's Alkaligrass - Foxtail Barley (*Puccinellia nuttalliana* - *Hordeum jubatum*)
 - SARA – N/A
 - BC List – Red
 - Observation Source(s): iMapBC - Biogeoclimatic Ecosystem Classification Program of British Columbia.
 - Observation Date(s): 2006 and 2014
 - Location(s): SE end of North Bummers
 - Further Details:
 - Terrestrial Realm - Grassland Group (G): Alkaline/Saline Meadow Class (Ga)
 - This alkaline meadow occurrence is based on a field sample and was mapped using recent aerial imagery

- The vegetation on these sites is strongly driven by water levels. Annual and seasonal fluctuations in water levels results in changes to the vegetation over time. The vegetation and ecological community on this site may have changed since the time of field sampling.

During the wetland inventory conducted by NTBC staff in July 2024, the area where the Nuttall's Alkaligrass - Foxtail Barley community was originally identified was reassessed. The plot conducted in this location led to a preliminary reclassification of the community to a Giant Wildrye Alkaline Meadow community (Leymus cinereus Herbaceous Vegetation). This community is also BC red-listed and rare.

It should be noted that the Conservation Partners are waiting for confirmation on this rare community classification from the B.C. Conservation Data Centre (CDC).

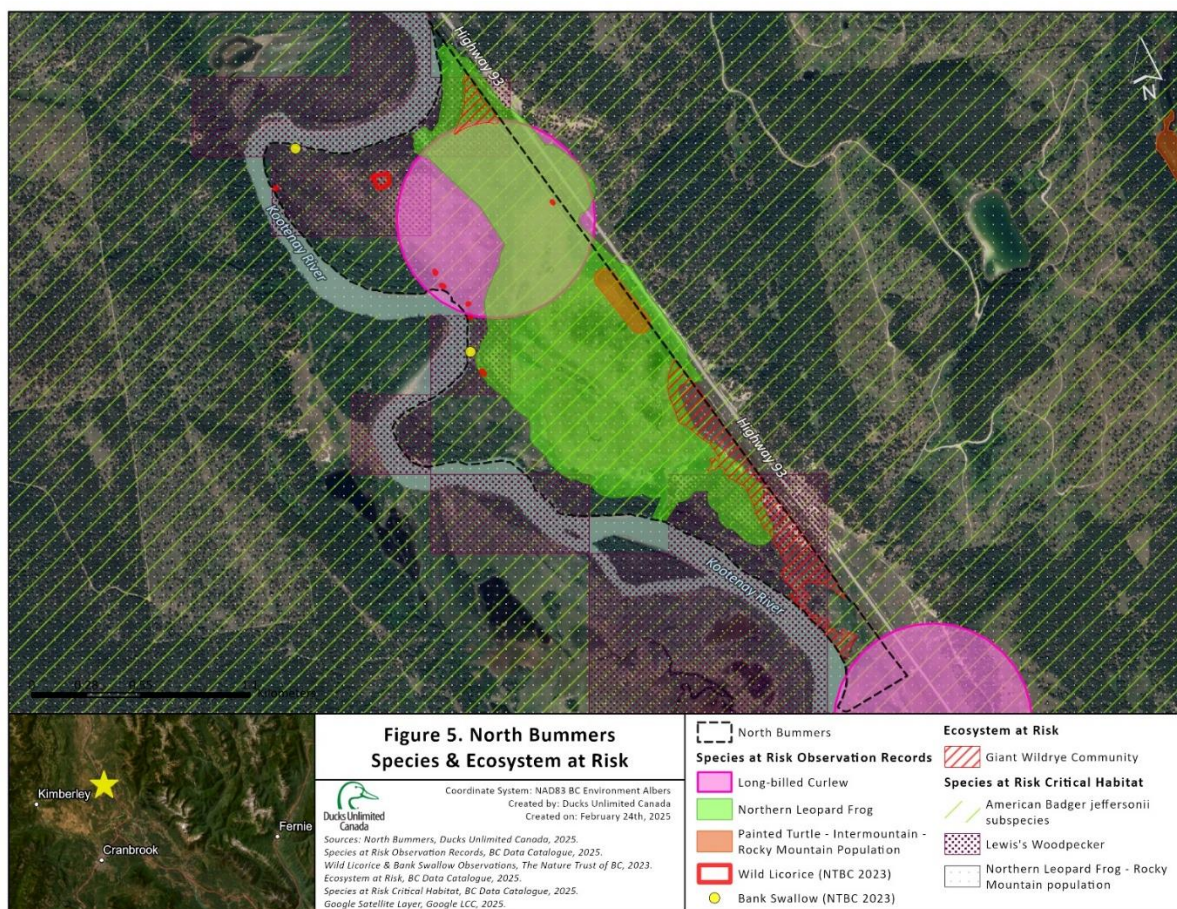


Figure 6. North Bummers Species & Ecosystems at Risk

5.6 Archaeology

Based on the results of the AOA and PFR, the project area is assessed with low potential for the presence of archaeological sites. Therefore, no further archaeological study is recommended for the project area provided restoration plans are not revised to include unassessed areas.

As noted in the results, areas of elevated archaeological potential were observed and discussed by the field crew immediately outside of but associated with the current project area. Further, given the proximity of the project to the Kootenay River and high wildlife values of the project area, the team will employ a *Chance Find Procedure* during the proposed project works as a precautionary measure. DUC will also try to contract a cultural advisor from ʔaḡam to be on-site daily and act as a cultural monitor and advisor during the construction period.

6. DISCUSSION

Year 1 of the project resulted in strong support from ʔaḡam and the other partners to naturalize the floodplain. The Conservation Partners accomplished of a wide range of activities from permit application submissions, bathymetry and river modelling work, elevation surveys and conceptual design plans to baseline monitoring.

In addition to mandatory consultation, extensive engagement was undertaken with ʔaḡam throughout year 1 of the planning processes. The Conservation Partners attended band meetings, planned two engagement sessions and presented to the Language Speakers and Knowledge Holders Committee, Lands Committee, and Chief and Council. ʔaḡam is both a project partner and key advisor on the project. Two band members were also hired by DUC: a Ktunaxa Language and Cultural Liaison and a Ktunaxa Knowledge Environmental Monitor.

During the second engagement workshop with ʔaḡam, the project team collated information on community benefits of the project. Some community benefits of the restoration project that were highlighted in the engagement session included signage in Ktunaxa language, sharing and learning traditional names of lands, plants and animals, understanding of ʔa·kxamis ḡapi ḡapsin (All Living Things), recreational benefits (hunting, food gathering, lookouts, connecting with nature), more consistent flow of water, planting traditional plants that are disappearing, carbon capture, erosion protection, increasing beaver and other keystone species, improving wildlife management and sustainable use of area, and supporting the Aknusti mentorship program.

7. RECOMMENDATIONS

The project is on track to start construction at North Bummers in 2025 (Year 2 of the project). Year 2 will also involve planning activities at Middle Bummers. In year 3 in 2026, phase 2 of restoration work will be completed at North Bummers and phase 1 construction will begin at Middle Bummers. Years 4 and 5 will focus on completing restoration work at Middle and South Bummers. Securing funding for future years is critical to the success of the project and meeting outcomes for holistic floodplain restoration at scale.

The work proposed at North Bummers involves both maintenance of existing infrastructure (associated with water licence #C064882) and new works to return the natural river-floodplain connection. The work under this pending license amendment will be completed over two years and included the following:

- Breaching the existing dikes near the railway
- Breaching the existing central internal dike and diversion ditch
- Recontouring some areas within the licensed impoundments to enhance wetland habitat diversity and to increase water depth and storage.
- Using the material generated from recontouring to build upland habitat areas
- Installing strategically located ditch plugs to disable ditching draining the floodplain

- Removal of a crescent dike that is protecting the land from flooding
- Removal of the existing pump and associated BC Hydro transmission lines
- Repairing excavated inlet or designing it into side channel

Construction timing is expected to occur in October 2025. All construction will occur outside of sensitive species windows, including construction outside of bird nesting periods protected under the Migratory Birds Convention Act (1994) and the BC Wildlife Act. No disturbance will be made to wildlife nests, including beaver and muskrat dens, except on diked land.

DUC and BC Parks have prioritized the restoration of Bummers Flats over the next several years and have committed resources and budget to this project. DUC is responsible for costly infrastructure at Bummers Flats, which has begun to fail over the past several years, and there is a small window of opportunity to redesign this project and achieve multiple environmental outcomes while also supporting Truth and Reconciliation. FWCP funding is critical to leverage funding and seize this opportunity to perform large-scale floodplain restoration and reverse the loss of floodplain and wetland habitat in southeastern BC.

8. ACKNOWLEDGEMENTS

DUC, NTBC, WLRS gratefully acknowledge the traditional territories of the Ktunaxa and Shuswap Nations, as well as ʔaqam for their continued support and partnership on the project. The Conservation Partners also gratefully acknowledge the financial support from FWCP, Columbia Basin Trust, Elk Valley Resources, Habitat Conservation Trust Fund, The Nature Trust of BC, and The Province of BC.

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