Wetland and Riparian Enhancement Project

(COL-F22-W-3495-DCA)

2021-2 (F22) Activity Report

1 April 2021 to 31 March 2022

Prepared for: Fish & Wildlife Compensation Program

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Executive Summary

For the F22 fiscal year the Annual and Ongoing Wetland and Riparian restoration project completed tasks involving post restoration monitoring at several locations. Post treatment monitoring and maintenance was completed at the DL 570 and DL 881 wetland restoration complexes in Meadow Creek. Post treatment Monitoring at Creston constructed wetlands included Amphibian Visual encounter surveys and water level monitoring. Post treatment monitoring was completed in the East Kootenay at Hyppo basin and Turtle lake wetlands.

Support for wetland restoration planning was provided for several partnered projects Frog Bear wetland and corridor in Creston, SunCreek wetland in the East Kootenay and Beaver wetlands in the lower Duncan.

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1. Introduction

Wetland and riparian habitats were significantly impacted by reservoir footprint habitat losses, support diverse arrays of fish and wildlife species and have high primary productivity and a functional role in the transfer of primary production between terrestrial and aquatic habitats. Given these impacts to these important values the need for FWCP to increase its efforts to compensate and mitigate for wetland habitat losses was identified.

The Wetland Riparian Enhancement Project was added to the Annual and Ongoing wildlife projects in 2014 on the recommendation of the Board and Wildlife Technical Committee to increase FWCP's capacity to support and deliver wetland and riparian enhancement project work. The project includes tasks such as identify candidate restoration sites, compile background information, pre-treatment inventory of sites, complete restoration plans working with a wetland specialist, and develop the partnerships, permits and budgets for implementation of the restoration projects

The Wetland and Riparian Enhancement Project is a component of the annual and ongoing fish and wildlife projects delivered by the Ministry of Forests, Lands, Natural Resource Operations and Rural Development (FLNRORD) through a Letter of Agreement (LoA).

In 2021 -2022 project work was delivered by FLNRORD staff and contractors working in close partnership with project partners including; BC Parks, The BC Wildlife Federation Wetlands program, Nature Trust of BC, Nature Conservancy of Canada, Creston Valley Wildlife Management area and the BC Northern Leopard Frog Recovery Team.

2. Goals and Objectives and Linkage of FWCP Action Plans and specific action(s)

Components of the Wetland Restoration project for F22 include the following:

1. Monitoring and Maintenance of wetland restoration projects, includes both pre and post treatment monitoring. Monitoring sites include Meadow Creek, Creston and Findlay area wetlands.
2. Wetland Restoration Planning - develop wetland restoration plans for priority sites working with wetland experts and project partners.

This project addresses the following Priority 1 actions in the Columbia Riparian and Wetland Action plan.

COLWRA.ECO.ME.21.01 Effectiveness monitoring of past projects-P1
Monitor and evaluate the effectiveness of previous FWCP wetland and riparian restoration projects (for monitoring of species see Action #38 below). Include an approach for adaptive management, documenting and assessing ecological conditions and parameters (pre- and post-restoration), information sharing and collaboration among agencies and the public stakeholders to increase the efficacy of conservation action.

COLWRA.ECO.HB.13.01 Restore and create wetland/riparian habitat-P1

Restore and create wetland and riparian habitat to address impacted, degraded or lost habitat. Where possible collaborate and engage with the community, and upon project completion share information with appropriate regional organizations and agencies.

COLWRA.ECO.HB.12.01 Development of ecosystem restoration plans-P1
Support the development of ecosystem restoration (ER)plans for priority wetland and riparian habitats as per the direction of Action #11. These plans should assess limiting factors, describe opportunities for FWCP investment, guide future work in these areas with specific actions and targets, and describe how results should be monitored. Updates to existing ecosystem plans may be required.

3. Study Area

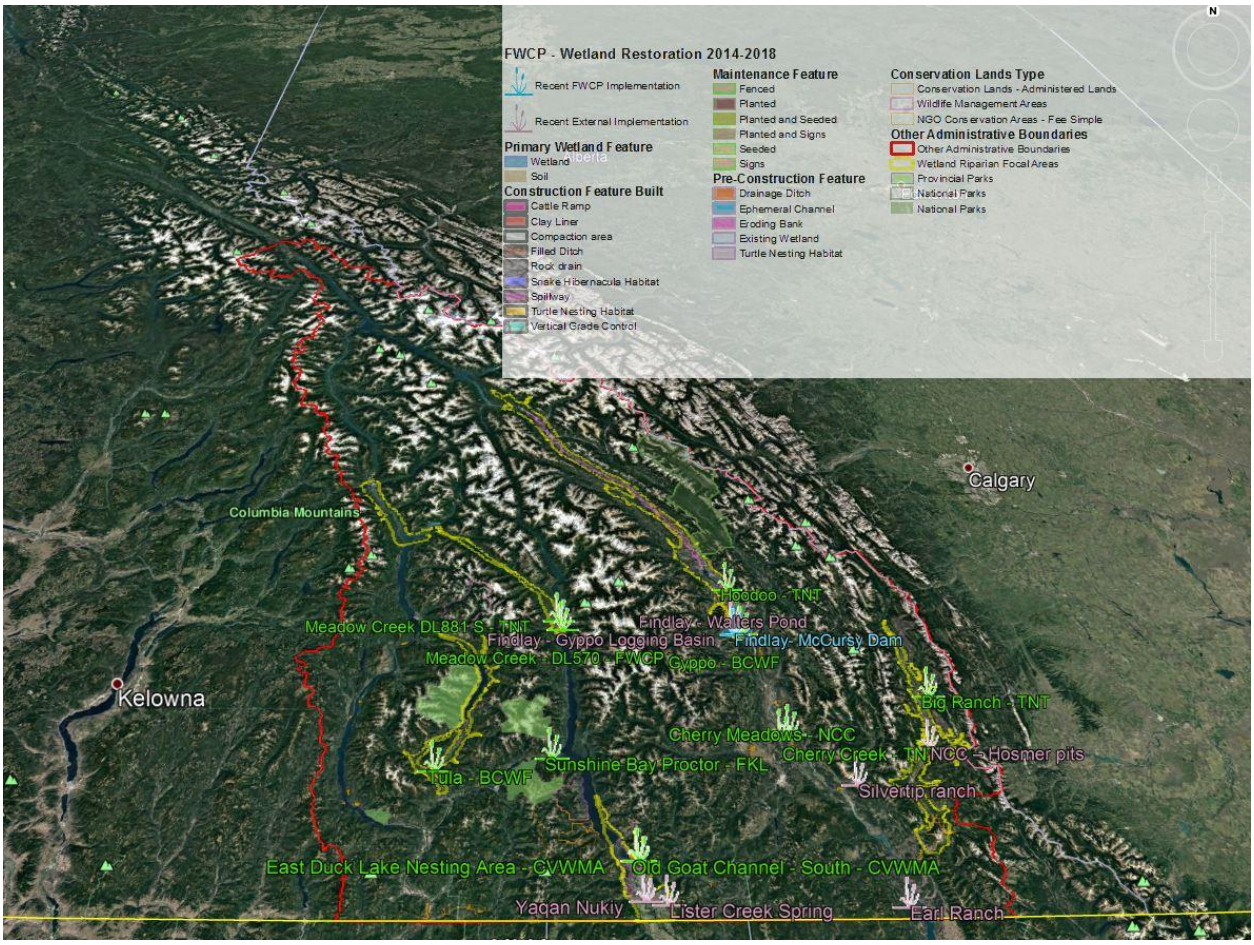

Figure 1 Wetland and Riparian Restoration projects location map.

4. Methods

Project Methods are documented in detail in the technical reports for the project located on the Species Inventory Web Explorer at the following link
http://a100.gov.bc.ca/pub/siwe/details.do?projectId=5587&surveyId=33977&pagerOffset=0
Please refer to the above link for detailed project information.

General methods in 2021 included surveys to locate egg masses and determine species breeding at a wetland ponds. Following breeding, visual encounter surveys and tadpole surveys are completed to monitor metamorphosis and the status of summer habitats.

5.0 Results and Outcomes

Results for 2021 work are briefly summarized here. Please refer to the specific project report references for more detail.

5.1 Monitoring and Maintenance

Wetland Restoration Monitoring- Duncan Lardeau Conservation Complexes (DL570 and DL 881)

The main priorities of this 2021 monitoring season were to monitor invasive species and complete invasive treatments focusing on thistle and burdock. Water level monitoring was completed at DL570 using a newly installed level logger.
The thistles around the created wetlands on Lot 881 and Lot 570 were cut with brush saws and weed-eaters by NTBC, First Nation and MFLNRORD crews in June in August. The objective was to cut thistles in the bud stage prior to flowering and in most cases this was achieved.
Around the Lot 881 wetlands, we observed the thistle was being out-competed by Rushes (Small-flowered bulrush) and Reed Canary-grass in many microsites when surveyed in mid June, 2021. When the crew went to cut there in late June they found only a few patches needed treatment, as the thistle was overtopped by competing vegetation in the others (K Vaino, pers.comm.). Only a portion of the high priority areas were cut due to limited crew time, Lot 881 was only treated once, in 2021.
Around the Lot 570 wetlands, the thistle abundance has increased on several of the 'dirt mounds '(near pools 10 and 12, and west side of 9) in the years since wetland construction, but has disappeared in other areas (south end of pool series, meadow edge near Pool 9). There were two years when thistle flowered twice - for which crews/schedules were not prepared - and this is the likely explanation for the increase in thistle density since 2019 on some of the dirt mounds. In 2021, thistles on all of the mounds were cut twice with the exception of the east side of Pool 9. The mound east of Pool 9 was cut only once, in late July, when seeds were developing, so it can expect to require extra attention in 2022.
Recommendations for Thistle control in 2022
The observations of thistle being out-competed by other vegetation around the Lot 881 wetlands leads to wondering what, if anything, can be learned and applied going forward to the Lot 570 wetlands where thistle are the more current problem, . When cutting occurs with brush saws and weed eaters, the vegetation around the thistle is also cut because the thistle plants

are growing so densely. It is possible that the conditions on Lot 881 developed in part because there was no cutting in 2019 or 2020 on Lot 881.
It is recommended that on Lot 570 the bud-stage cutting of thistle continue (twice per year, if needed) but that a few different techniques also be tried, even if on a small-scale trial basis. Suggested for consideration are
(1) Strong solutions of vinegar on young plants in the first hot days of spring (early- mid- May) and
(2) removing whole plants including roots early in the year if possible to do without breaking roots, followed by immediately seeding (clover) in disturbed soil, OR individual clipper-cutting of thistle low to the ground at the bud stage.
For Lot 881, it is suggested the remaining high priority patches be checked and cut at bud stage if needed, i.e., if not being overtopped by competing vegetation.

Deliverable reference – Herbison, B. 2021. DUNCAN – LARDEAU CONSERVATION PROPERTIES 2021 Burdock and Thistle treatment records and summary report
Unpublished report. Prepared for Ministry of Forests Lands Natural Resource Operation and Rural Development.

CVWMA Constructed Wetlands

Amphibian monitoring with a focus on Northern Leopard frog presence was prioritized at the CVWMA constructed Wetland complex from April until October.

There was no breeding activity and little Northern Leopard frog activity observed in the constructed wetlands in 2021. Habitat conditions were poor with little water remaining in constructed wetlands by late summer.

Deliverable reference - McGlynn, K. 2022. Northern Leopard Frog Project 2021 report. Prepared for Ministry of Forests

East Kootenay Restored Wetland- monitoring

East Kootenay sites monitored included Turtle Lake and the Hyppo basin. Both of these sites were monitored for invasive plants, cattle usage, or disturbance. Continued monitoring for weeds and hand pulling where needed in all areas disturbed from construction including the access points. Newly created turtle nesting sites on the southern edge of Turtle Lake were monitored throughout the turtle breeding season. At the Hyppo basin a natural fence was constructed and a variety of deciduous stakes were planted to create more habitat and help with controlling where cattle can access the site.

Deliverable reference-Lewis, R.D. 2022. 2021-22 East Kootenay Wildlife Technician Deliverables and Summaries. Unpublished report prepared for the Ministry of Forests, Lands, Natural Resource Operations, Rural Development, FWCP-Section.

Wetland Restoration Planning

Frog Bear wetland and corridor monitoring to support planning

In the CVWMA wetland and habitat restoration is planned for the Frog-Bear conservation property and the Frog Bear corridor, a riparian channel connecting the CVWMA with NCC's Frog Bear property. To support restoration planning, Amphibian Visual encounter surveys were conducted in these areas to collect information on the importance and use of the area. The Frog-bear corridor was not previously surveyed as part of the Northern Leopard frog project and it was found to have the highest number of summer observations. This channel runs for 800m under a thick riparian canopy of shrubs and trees, before remerging to a canopy-free, steep, reed canary grass dominant channel for another 1000m. The south side of this channel abuts an agricultural field that is cut frequently to within 1.5 m of the wetted channel. This area was highly active with basking and foraging frogs within .10 m to 5 m from the wetted edge of the channel. This channel (including west, east and the FB Pond) was dominated by observations of YOY (n=98)relative to Juveniles (n=8) and Adults (n=5). Monitoring and follow up recommendations will continue as the projects are planned and implemented.

Deliverable reference - McGlynn, K. 2022. Northern Leopard Frog Project 2021 report. Prepared for Ministry of Forests

East Kootenay wetlands

In preparation for future wetland restoration work conducted by the BCWF, FLNRORD provided a tour of Findlay area wetland restoration projects to two groups of First Nations. This information sharing tour was held in the fall to help build involvement in future projects

Wetland restoration planning assistance was also provided for the Sun Creek wetland working with the BCWF and the West Side of Columbia Lake projects working with NTBC.
Ground truthing of water diversions was completed in the early spring of 2021 to assist with potential wetland restoration on the west side of Columbia
Lake.

Assistance was provided for the logistics and planning stage of the Sun Creek project. Local water users were provided a tour of the site to show them what was proposed and provide information about creating new wetlands within their water shed. Working closely with the BCWF Environmental crews assistance was provided on the prescription and development of a management plan for this coming season.

Deliverable reference-Lewis, R.D. 2022. 2021-22 East Kootenay Wildlife Technician Deliverables and Summaries. Unpublished report prepared for the Ministry of Forests, Lands, Natural Resource Operations, Rural Development, FWCP-Section.

Beaver wetlands in the Lower Duncan

This project is looking at opportunities to support Beavers in their role creating wetlands in the Lower Duncan estuary. Two projects were investigated and planned for implementation in 2022. Work is funded by the Kootenay Lake Local Conservation Fund in addition to MoF. Beaver restoration works are planned on and near Lower Duncan Conservation Lands.

PROJECT 1-A BEAVER CANAL ANALOGUE

This project proposes to reopen an old beaver canal to provide supplementary water to the existing pond/wetland system and thus to encourage more expansive, successful and permanent beaver activity there. The restoration concept is to source supplementary water from 'upstream groundwater' by re-opening old beaver canals. Elevation surveys were completed to determine the extent of opening required to bring water to the site.

PROJECT 2-A – BEAVER DAM ANALOGUE

This project proposes to construct a small 'starter dam' on a small outlet channel that flows out of the oxbow pond. The proposed design follows recommendations in the Beaver Restoration Guidebook. A detailed work plan is in progress for this project. The short-term objectives of this project are to raise the water levels in the pond moderately in low flow periods and to create an elevation difference leading to increased flow which it is hoped will attract beavers to add to this dam or build another dam downstream.

Figure 2: Project 2A Beaver dam analogue.

Deliverable reference- Herbison, B. 2021. Duncan Lardeau Beaver projects – Interim report November 2021 Unpublished report prepared for the KLLCF and Ministry of Forest Lands and natural Resource Operations.

6.0 Discussion

2021 was the 7th year of the Wetland Restoration Project within the FWCP annual and ongoing program. After several years of implementing restoration projects, the focus has now shifted to planning and monitoring.

Past monitoring work has demonstrated success of constructed projects in providing amphibian breeding habitat. In 2021 work focused on Invasive plant treatment and maintenance of upland areas adjacent to constructed wetlands. Efforts included assessment of invasive plants, mechanical treatments, planting and re-seeding and managing cattle disturbance. Ongoing efforts will be needed to maintain upland areas adjacent to wetlands.

Wetland restoration planning continues to be a good investment ensuring well designed projects continue in the region. Investing in planning allows project partners to have a head start on securing funding from other available sources. Project team members contributed their knowledge and collected additional information to help ensure successful future implementation of these restoration projects.

Successes and Challenges

- Partnerships with First Nations and Non-government organizations have increased the scope of wetland restoration in the Columbia region.
- FWCP funds have successfully leveraged funding form federal and other sources.
- Monitoring has documented that restored wetlands are providing breeding habitat for many amphibian species and other wildlife
- Beaver habitat restoration can provide long term wetland habitat benefits.
- Future wetland restoration projects will be larger in scale and more complex integrating riparian and wetland habitats and connection. Additional professional expertise will be needed for these projects.
- Disturbed soil upland of restoration projects requires ongoing monitoring and maintenance to deter invasive plant in growth

7. Acknowledgements

This project was completed with financial support Fish & Wildlife Compensation Program on behalf of its partners, BC Hydro, the Province of B.C., Fisheries and Oceans Canada, First Nations, and Public Stakeholders to conserve and enhance fish and wildlife in watersheds impacted by BC Hydro dams. Thanks also to our many project partners; Brenda Herbison, CVWMA Marc Andre Beaucher, BCWF, Okanagan Nation Alliance, Nature Trust BC Chris Bosman and Joe Strong, Nature Conservancy of Canada Richard Klafki and Adrian Leslie.