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Project Title: Advancing Wetland Stewardship & Restoration in the Kootenays

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Executive Summary

Beginning April 1 2018, the BC Wildlife Federation's Wetlands Education Program successfully completed a series of wetland restoration projects in the Kootenays and hosted a series of workshops to build community capacity. In collaboration with multiple partners, BCWF was able to restore wetlands for wildlife while controlling invasive species, mitigating cattle impacts, filtering water, providing training for First Nations Technicians, and creating an educational wetland and stream site for elementary school students. The 2018 projects closely align with the FWCP's Columbia Basin Riparian and Wetland Action Plan and included initiatives in two of the FWCP's focal areas: Upper Columbia Valley and the Creston Valley. A summary of the results are:

- Trained 10 community members in wetland stewardship and mapping techniques during a Map our Marshes workshop in Salmo.
- Restoration of 13.7 ha of wetland habitat on Yaqan Nukiy Lands
- Restoration of 0.16 ha of stream and wetland habitat at Erickson Elementary School
- Restoration of 0.26 ha of wetland and riparian habitat at Lister Creek headwaters
- Restoration of 0.43 ha of wetland habitat at Haywire Ranch
- Restoration of 2.38 ha of wetland habitat at Elk Spike Farm
- Development of wetland restoration design for King George VI Provincial Park
- Enhanced capacity of First Nation technicians and workers in wetland restoration through hands-on experience
- Educated 51 participants on Wetland Restoration in the Kootenays in the Kootenay Conservation Program Webinar
- Trained 8 school staff at Erickson Elementary School during an Outreach/ Pro-D day session, and hosted a planting event with over 50 students

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Introduction

In comparison to many other ecosystems, the benefits from wetlands are exceptionally large relative to their size (MacKenzie and Shaw 1999). Based on one commonly referenced study, the market and non-market values of wetland goods and services (ex. climate regulation, nutrient cycling, and food production) are valued at \$19,580 hectare/year (Costanza, *et al* 1997), which extrapolates to approximately \$100billion/year in B.C.(MOE 2010). When total economic values are considered, wetlands often provide greater economic returns than when the land is converted for other uses (WRI 2005). However, wetlands have been historically degraded and destroyed in low-elevation areas of the Kootenay region from large scale developments (such as hydro-electric production, agriculture, diking, and transportation networks) as well as from residential growth (e.g., see Utzig and Schmidt 2011). Furthermore, remaining wetlands are at risk of degradation from human activities such as mud-bogging and the introduction/spread of invasive plants.

The Fish and Wildlife Compensation Program considers wetland conservation and restoration as a priority for the Columbia Basin and has developed a number of interim initiatives (*Columbia Basin Riparian and Wetlands Action Plan* [Draft] 2012). Other action plans in the Columbia Basin identify wetlands as a priority habitat for conservation/restoration (e.g., see Green et al. 2006). As with previous years, the BC Wildlife Federation's Wetland Education Program (WEP) supported these initiatives by building the capacity of residents to protect, enhance, and restore wetlands through the following programming: delivery of a Map our Marshes Workshop in Salmo, through hands-on restoration training in the Creston area, and through a webinar titled "Wetland Restoration in the Kootenays".

Wetland, stream, and riparian habitat were restored at 5 sites across the Columbia Basin; 13.7 ha on Yaqaan Nukiy Lands, 0.16 ha at Erickson Elementary School, 0.26 ha at Lister Creek headwaters, 0.43 ha at Haywire Ranch, and 2.38 ha at Elk Spike Farm. Restoration was completed to support wildlife, control invasive species, and mitigate cattle impacts, among other benefits. Furthermore, wetland restoration designs were completed at King George VI Provincial Park for works in 2019. The design proposes the restoration of a partially filled and drained wetland and improves habitat for the blue-listed Northern Blue Violet. This report provides further details to the above projects, their impact, and future steps to be taken.

Goals and Objectives

1. Goal: Through workshops, increase community capacity to map, classify, restore, and steward wetlands in the Columbia Basin.
 - Objective: Train 10+ participants during the delivery of a 1-day Map our Marshes in Salmo
 - Objective: Train 10+ participants through site visits, outreach, and a webinar.
 - Objective: Train Yaqaan Nukiy Technicians through hands-on restoration work.

2. Goal: Restore wetland habitat in the Columbia Basin
 - Objective: Restore 3.2 ha of wetland habitat on Yaqaan Nukiy Lands
 - Objective: Restore 0.07 ha of wetland and stream habitat at Erickson Elementary School
 - Objective: Restore 0.13 ha of wetland habitat at the Lister Creek Headwaters
 - Objective: Restore 0.4 ha of wetland habitat at Haywire Ranch
 - Objective: Restore 2.2 ha of wetland habitat at Elk Spike Farm

3. Goal: Support wetland restoration at King George VI Provincial Park
 - Objective: Develop wetland restoration design for King George VI Provincial Park to support the Northern Blue Violet

The above goals and objectives correspond to the following Habitat-based Actions from the Upper Columbia Riparian and Wetland Action Plan.

Table 1: Recommended actions that apply to all six focal areas

- 11-1 Monitor and treat terrestrial invasive species in wetland and riparian areas.
- 12-1- Restore and create wetland and riparian area habitat in this focal area, where feasible, to address impacted, degraded, or lost habitat (including, but not limited to, gravel pits where they exist on the floodplain, oxbows, and side channels
- 13-4- Explore options to collaborate with partners, in order to conserve and enhance wetland and riparian areas.

Table 2: Action Priorities for the Upper Columbia Valley

- Restore and create wetland and riparian area habitat in this focal area, where feasible to address impacted, degraded or lost habitat (including but not limited to gravel pits where they exist on the floodplain, oxbows and side channels).

Table 4: Action priorities for the Creston Valley

- 7-4 Support the development of management plans for wetlands in this focal area, including but not limited to the Yaqaan Nuki wetlands

Study Area

Below are GPS locations of related workshops and restoration projects, with descriptions of field locations when appropriate.

- Map our Marshes, Salmo
 - Erie Lake: 49.189434, -117.336060
 - Lakeside shallow open water and marsh habitat used to train participants in plant ID, mapping, and wetland classification
 - KP Park Wetland: 49.196004, -117.274544

- Shallow open water wetland restored by BCWF in 2013 as part of the Wetlands Institute. Here participants learned how to map wetlands using handheld GPS units.
- Wetland Restoration
 - Yaqaan Nukiy Lands, Creston: 49.071536, -116.545556
 - Located on the floodplain of the Kootenay River, this area was modified in the 1970's with artificial impoundments, ditches, dikes, pipes, pumps, and other water control structures (some of which were failing and/or expensive to maintain). Some of the site is used for pasture and farming, and much of it is dominated by invasive Reed Canary Grass. Within close proximity to the Creston Wildlife Management Area.
 - Erickson Elementary School, Erickson: 49.091167, -116.467972
 - Previously an orchard, this site was dominated by agrarian, invasive, and harmful species. The site contained a drainage ditch suffering from erosion and an advancing headcut. The site was acquired by the School District, and will benefit students as an outdoor classroom.
 - Lister Creek Headwaters, Lister: 49.053647, -116.426656
 - Owned by the Regional District of Central Kootenay, this headwater spring site was modified with dams, pipes, and other water control structures to provide water for Lister. The site was abandoned in 2012 and existing wetlands were at risk of being lost due to erosion.
 - Haywire Ranch, Park Siding: 49.1713100, -117.5071000
 - Located on the Beaver Creek floodplain, which was drained for agriculture in the late 1960s and early 1970s. Adjacent to one of the last portions of Beaver Creek with mature forest and natural sinuosity remaining.
 - Elk Spike Farm, Blaeberry: 51.416278, -117.053953
 - Large agricultural field dominated by invasive Reed Canary Grass and is too wet to farm. Directly adjacent to the Moberly Marsh site (in the Upper Columbia region) where additional wetland restoration works are planned.
- Wetland Restoration Design
 - King George VI Provincial Park, Rossland: 49.011562, -117.833782
 - The park is located in the Southern Monashee Mountains, just North of the Canada-US border. The proposed restoration site was partially drained, filled, and compacted. The blue-listed Northern Blue Violet was historically found on site.

Methods

Map our Marshes

The BCWF hosted a 1-day Map our Marshes workshop in Salmo to train participants in wetland classification and inventory in order to assist with regional wetland needs, particularly those of the Salmo Valley Seniors ATV Club and Central Kootenay Invasive Species Society. In the field, participants were shown how to delineate wetland boundaries using GPS units, identify vegetation, texture soil types, and record field data. Methodologies were primarily based on the Wetlandkeepers Handbook (Southam and Curran 1996) and Mackenzie and Moran (2004)'s Land Management Handbook 52; Wetlands of British Columbia: a guide to identification. The workshop schedule was designed with input from project partners.

Outreach

A webinar was hosted by BCWF, in partnership with the Kootenay Conservation Program (KCP), to educate participants on wetland restoration in the Kootenay region. It included key techniques for designing long lasting wetlands that require minimal maintenance and provided examples of projects within the region.

An outreach event was hosted during a Pro-D day at Erickson Elementary School to educate school staff on wetland conservation and stewardship of their schoolyard wetland. Later, a planting event was hosted at Erickson Elementary and involved staff and students of the school.

Wetland Habitat Restoration

Wetland design prescriptions were developed by Tom Biebighauser and Robin Annschild, with input from landowners and regional biologists. Over 35 years Tom has designed over 5,000 wetland restoration projects and successfully restored over 2500 wetlands in North American and New Zealand. Since 2014, Robin has restored over 200 wetlands. Projects were designed to have a high degree of success, provide maximum ecological lift, be inexpensive, and require little or no maintenance. Excavated soils remained on site and were used to create ridges, islands, and hummocks to increase habitat complexity. Compacted soils within and surrounding each restored wetland were loosened using an excavator or ripper attachment on a dozer. Where appropriate, bare soils were seeded with native species, seeded with wheat, and/or covered with straw to reduce erosion. If appropriate, logs and coarse woody debris were also placed in and around wetlands as habitat features. Specific site details can be found below.

- Yaqaan Nukiy Lands, Creston
 - Soils excavated to restore wetland depressions were used to fill drainage ditches as well as raise the surrounding elevation to support drier species instead of the invasive Reed Canary Grass present.
 - Core trenches were dug across ditches, filled with clay, and compacted to maintain water in wetlands restored by filling ditches.
 - Features were added to restored wetlands and uplands to provide specific habitat for Species at Risk, including snags for little brown bat roosting, basking logs and nesting areas for Western painted turtle, mud for Barn Swallow and the Black Swift to use for building nests, ephemeral wetlands that do not support the American bullfrog or fish that the Northern leopard frog and Western toad may use for breeding.
 - To facilitate knowledge transfer, Yaqaan Nukiy staff worked directly alongside Tom Biebighauser as the wetlands were restored and Yaqaan Nukiy excavator operators were used, in part, to complete restoration works – where the operators gained new experience on wetland restoration techniques.
- Erickson Elementary School, Erickson
 - The ditch was excavated to create a sinuous stream with three hydrologically connected wetlands.
 - Logs and rock were buried as vertical grade control structures to halt headcuts.

- Logs were buried at the inlet and outlet of each wetland as vertical grade control.
- Logs were also used to create bridges for students to cross the restored stream.
- Tom Biebighauser provided a short presentation at a student assembly about the project
- Hosted an outreach event for school staff on wetland stewardship and restoration during a Pro-D day
- Hosted a planting event with students
- Lister Creek Headwaters, Lister
 - Core trenches were dug across ditches, filled with clay, and compacted to maintain water in the restored wetlands.
 - Core trenches were dug and filled with clay along the lower edge of wetlands where needed to interrupt sand and organic layers that could drain wetlands.
 - A 2 m tall dam was removed to restore a more natural flow to Lister Creek, large boulders were buried across the riparian area to control erosional head-cuts, and a wide floodplain was restored.
 - Areas of sand and gravel were created as nesting habitat for the Western painted turtle.
- Haywire Ranch, Park Siding
 - Areas that were flooding due to beaver activity, and too wet to farm, were deepened to create shallow wetlands. Soils removed were used to raise and existing access point on the northern portion of the site.
 - A series of wetlands were excavated in the southwestern portion, which was largely dominated by Reed Canary Grass, to expose floodwaters. Willows present on site were left untouched.
- Elk Spike Farm, Blaeberry
 - 5 large ephemeral wetlands with varied depths were excavated, primarily built for waterfowl. Excavated soils were used to raise surrounding fields and increase agricultural potential. Soils excavated in 2017 were also spread.

Wetland Restoration Design

In August 2018, wetland restoration specialist Robin Annschild conducted a site visit with Amanda Weber-Roy (Conservation Specialist, BC Parks), BC Parks operational staff, and Eva Cameron (Landscape Designer and Vice-Chair, Rossland Society for Environmental Action) to survey the area and create a wetland restoration plan. To inform design choices, a rare species inventory and archeological assessment were also conducted. Previous amphibian surveys were also considered.

Results and Outcomes

Map our Marshes Salmo

10 participants attended the workshop. The Salmo Valley Seniors ATV Club has created signs that show "no off road vehicles - sensitive areas" that they will place near wetlands on their trail networks. After the workshop participants were provided a survey, of which 7/10 were returned. Of respondents, 29% ranked the workshop "Among the Best", which the remaining 71% ranked the workshop "Above Average" when compared to other workshops or extension courses they've taken. 85% of respondents stated they would recommend the workshop to others, while the remaining 15% of respondents did not respond.

Outreach

51 participants joined the webinar; participants were educated on wetland restoration design and techniques, and details about local wetland restoration projects in the Kootenay region.

8 school staff of Erickson Elementary were educated on wetland conservation and stewardship of their schoolyard wetland during the outreach/Pro-D day event.

4 classes of students were engaged during a planting event at Erickson Elementary; the event was delivered by two local expert contractors, and 800 plugs and 50 1-gallon pots were planted.

Wetland Restoration Design

A wetland restoration design was created for the King George VI Provincial Park project, which will be implemented in Fall 2019 as part of BCWF's annual Wetlands Institute. The plan includes restoring wetland habitat by exposing groundwater, as well as filling in the ditch originally installed to lower the water table and drain the wetlands historically on site. See Appendix A for Design Report.

Wetland Restoration, Enhancement, and Securement

Methods described in the previous section were successfully carried out, resulting in the outcomes below:

- Yaqaan Nukiy Lands, Creston
 - 13.7 ha of wetland habitat was restored in areas previously dominated by invasive Reed Canary Grass
 - The rate of progress for this project was almost double of what has been recorded for similar wetland restoration projects completed by the same specialist in BC.
 - Yaqaan Nukiy staff and lead liaison on the project, Norm Allard, built capacity by working directly alongside Tom Biebighauser for the duration of the restoration
 - Yaqaan Nukiy members were involved as excavator operators during the project to provide them with hands-on experience restoring wetlands
 - 38 students and 4 teachers from Yaqaan Nukiy Independent School visited the project during construction to learn about the benefits of wetland restoration, as well as learn about restoration techniques.
- Erickson Elementary School, Erickson
 - The Central Kootenay Invasive Species Society treated invasive, non-native, and harmful species on site that established on exposed soils
 - 0.16 ha of wetland and stream habitat were restored
 - 800 plugs and 50 1-gallon pots of native species were planted by 2 contractors, and helped by students
- Lister Creek Headwaters, Lister
 - 0.26 ha of wetland and riparian habitat restored
- Haywire Ranch, Park Siding
 - 0.43 ha of wetland habitat restored
 - Contractors suppressed invasive and installed willow stakes as part of the commissioning phase
- Elk Spike Farm, Blaeberry
 - 2.38 ha of wetland habitat restored
 - Staff and volunteers planted 2645 plugs of thimbleberry, red osier dogwood, upland willow and red raspberry.

Discussion

BCWF's Wetlands Education Program continued its support in the Columbia Basin in 2018, and was in line with multiple FWCP priorities, as outlined in the Columbia Basin Riparian and Wetland Action Plan, including:

Table 1: Recommended actions that apply to all six focal areas

- 11-1 Monitor and treat terrestrial invasive species in wetland and riparian areas.
The Central Kootenay Invasive Species Society (CKISS) will continue to monitor restored habitat at Erickson Elementary for invasive species and will assist with removal if necessary.

- 12-1- Restore and create wetland and riparian area habitat in this focal area, where feasible to address impacted, degraded or lost habitat (including but not limited to gravel pits where they exist on the floodplain, oxbows and side channels)
The Lister Creek, Erickson School, and Yaqaan Nukiy sites are in the Creston focal area. The Elk Spike Farm is in the Upper Columbia Valley focal area.

- 13-4- Explore options to collaborate with partners, in order to conserve and enhance wetland and riparian areas.
Projects are in collaboration with FLNRORD, The Lower Kootenay Band (Yaqaan Nukiy), Salmo Valley Seniors ATV Club, Rossland Society for Environmental Action, Erickson Elementary School, School District 8, Haywire Ranch, Elk Spike Farm, The Creston Valley Wildlife Management Area, Regional District of Central Kootenay, Central Kootenay Invasive Species Society, BC Parks, and Kootenay Native Plants Society.

Table 2: Action Priorities for the Upper Columbia Valley

- 1-1- Restore and create wetland and riparian area habitat in this focal area, where feasible to address impacted, degraded or lost habitat (including but not limited to gravel pits where they exist on the floodplain, oxbows and side channels).
The Elk Spike Farm wetland restoration is within the Upper Columbia Valley focal area

Table 4: Action priorities for the Creston Valley

- 7-4 Support the development of management plans for wetlands in this focal area, including but not limited to the Yaqaan Nuki wetlands
This project is implementing a plan developed for Yaqaan Nukiy Wetlands

The Wetlands Education Program's 2018 work resulted in 16.9 ha of wetland, stream, and riparian habitat restored, which will have lasting benefits to wildlife, water quality, and education. First Nation technicians received hands-on experience on wetland restoration, Elementary School Students learned about environmental stewardship by helping restore habitat, and Salmo residents received training in wetland classification and mapping. The King George VI Provincial Park wetland restoration plan was created to support amphibians, reptiles, and the listed Northern Violet. Though not funded through FWCP, an Amphibian Baseline Report as well as an Archeological Overview Assessment were completed to better inform the wetland restoration plan.

Recommendations

BCWF's Wetland Education program strongly believes that training and providing support to communities, local stewardship groups, First Nations members, government workers, and professionals can increase the capacity for improved conservation and protection actions. 2018-2019 works had a strong emphasis on wetland restoration, which resulted in improved habitat for wildlife, invasive species management, and improved water quality. It is expected that many of these restoration efforts will lead to future restoration opportunities, as they have in the past. It is the Wetland Education Program's recommendation that the FWCP and other organizations continue to invest in similar capacity building programs in the Columbia Basin to build upon the momentum that the Wetlands Program instigated through the delivery of projects through 2012-2019.

Acknowledgements

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- Fish and Wildlife Compensation Program on behalf of its project partners BC Hydro, the Province of BC, Fisheries and Oceans Canada, First Nations and the public.
- Columbia Basin Trust
- Government of BC - Community Gaming Grant
- Wildlife Habitat Canada
- The Government of Canada's National Conservation Fund
- The Habitat Conservation Trust Fund
- Environment and Climate Change Canada
- BC Parks

We would also like to thank the following project partners for their support:

- FLNRORD, The Lower Kootenay Band (Yaqaan Nukiy), Salmo Valley Seniors ATV Club, Rossland Society for Environmental Action, Erickson Elementary School, School District 8, Haywire Ranch, Elk Spike Farm, Regional District of Central Kootenay, The Creston Valley Wildlife Management Area, Central Kootenay Invasive Species Society, BC Parks, and Valerie Huff.

References

- Ambrose, N., G. Ehlert, K. Spicer-Rowe. 2004. Riparian Health Assessment for Lakes, Sloughs, and Wetlands - Field Workbook. Modified from Fitch, L. B. W. Adams and G. Hale. 2001. Riparian Health Assessment for Streams and Small Rivers - Field Workbook. Lethbridge, Alberta. Cows and Fish program. 90 pp. Available Online: <http://www.cowsandfish.org/pdfs/LakeswetlandFieldWkbk2005.pdf>
- Biebighauser, T. 2011. Wetland Restoration and Construction, A Technical Guide. Upper Susquehanna Coalition. Burdett, New York, U.S.
- B.C. Ministry of Forest and Range. 2010. Field manual for Describing Terrestrial Ecosystems (2nd Edition). Land Manage. Handb No 25.
- Costanza, R. *et al.* 1997, The value of the world's ecosystem services and natural capital, Nature vol. 387.
- Green, B., G. Nellestijn, and P. Field. 2006. The Salmo River Watershed-based Fish Sustainability Plan Report. Stage Two: Setting Watershed Priorities. Columbia-Kootenay Fisheries Renewal Partnership, Cranbrook, B.C and Salmo Watershed Streamkeepers, Salmo, B.C. Available Online: <http://www.dfo-mpo.gc.ca/Library/328913.pdf>
- Fish and Wildlife Compensation Program. 2012. Columbia Basin Riparian and Wetlands Action Plan (Draft). B.C. Hydro, Vancouver, B.C.
Available Online:
http://www.bchydro.com/etc/medialib/internet/documents/about/our_commitment/fwcp/columbia_Riparian_Wetlands_ActionPlan_2012_jun.Par.0001.File.Columbia-RiparianWetlands-ActionPlan-2012-jun.pdf
- MacKenzie, W. and J. Shaw. 1999. Wetland Classification and Habitat at Risk in British Columbia. Proceedings of a Conference on the Biology and Management of Species and Habitats at Risk. Kamloops, BC 15-19 February 1999. Ed. Darling, L.M. Volume 2. BC Ministry of Environment, Lands and Parks, Victoria BC and University College of the Cariboo, Kamloops, BC. 520 pp. Available Online: <http://env.gov.bc.ca/wld/documents/re10mackenzie.pdf>
- MacKenzie, W. and J. Moran 2004. Wetlands of British Columbia: a guide to identification. Res. Br., B.C. Min. For., Victoria, B.C. Land Manage. Handb. No 52.
- Ministry of the Environment 2010. Wetlands in BC. Webpage Article. Environmental Stewardship Division, MOE, Government of British Columbia. Available Online: <http://www.env.gov.bc.ca/wld/wetlands.html>
- Southam, T. and Curran, E.A. (eds) 1996. The Wetlandkeepers Handbook: a practical guide to wetland care. B.C. Wildlife Federation, Surrey, B.C. and Environment Canada, Delta, B.C.
- Utzig, G., and D. Schmidt. 2011. Dam Footprint Impact Summary BC Hydro Dams in the Columbia Basin. Fish and Wildlife Compensation Program: Columbia Basin. Nelson, BC.
Available Online:
http://www.fwcp.columbia.ca/version2/reports/pdfs/FWCP-CB_Impacts_Summary.pdf
- World Resources Institute. 2005. Ecosystems and Human Well-being: Wetlands and Water. Synthesis Report. Millennium Ecosystem Assessment. Washington, DC. 68 pp.
<http://www.maweb.org/documents/document.358.aspx.pdf>

Confirmation of FWCP Recognition

FWCP's logo was displayed before the Map our Marshes workshop on advertisements (e.g., Eventbrite page) and during WEP workshops on participant packages, and in presentations. FWCP's contribution is also recognized online on the BCWF website, on blog posts, and in photo album descriptions. The 2019 Wetlands Update, BCWF AGM booklet, and BC Outdoors Magazine all recognize FWCP's contribution in print format. A sign will be at Elk Spike Farms, which thanks FWCP for its contribution. In addition, BCWF continues to distribute the Landowner Contact pamphlets that were created in 2015 with funding from FWCP.

Photos from the Salmo Map our Marshes Workshop can be found in the following album, which thanks WHC for its contribution in the description:

<https://www.flickr.com/photos/bcwfwep/albums/72157691120293550>

Below are some sample photos.



Below are some other examples of FWCP's financial support being accredited:



Figure 1: Sign that will be installed at Spike Elk Farm.

Map our Marshes.



...ish, joining forces with the Squamish River Watershed Society (SRWS) to deliver educational programs to students from grades 2-6! This year's theme was, "A River Runs Through Us" and the event was held at the ever relevant Mamquam Reunion. Rhonda O'Grady, the Education Outreach Coordinator for SRWS, developed four incredible stations that focused on connecting children to nature and teaching them about the relations between rivers, forests, salmon, beavers, and of course, humans. Each station brought another important topic to life through hands-on, place-based learning. Students were able to trek through mud, walk through a forest blindfolded, and get their hands dirty planting native trees and shrubs.

It was an incredible two weeks, full of learning, laughing, and connecting with nature. The WEP team couldn't have asked for better weather and an even better group of people to spend 6 days with. A big thank you goes out to the Squamish River Watershed Society and all other volunteers who took the time out of their day to be part of this incredible initiative. Special thanks to

the funders, Wildlife Habitat Canada, for helping make this event a possibility.

IF YOU BUILD IT, THEY WILL COME: SANDHILL CRANES SPOTTED IN WETLAND RESTORATION SITE

The WEP Team is celebrating a big win! A restoration project completed in Meadow Creek, in the Lardeau Valley at the north end of Kootenay Lake, is now home for a family of Sandhill Cranes, a species listed as "vulnerable" by the Province of BC. This last phase of the project was completed in the Spring of 2016. The area is an important corridor for elk and grizzly bear, and provides great habitat for many wetland associated species, such as Western Toad, Bobolink, and now the Sandhill Crane! This is the first time that Sandhill Cranes have ever been observed in this part of the region, signifying just how important wetland restoration work is!

Habitat restoration is an extremely important piece to wetland conservation and overall ecosystem health. From maintaining water flow during flood and droughts, to providing critical habitat for many plants and animals, wetlands offer

a tremendous amount of different functions that benefit the planet. They are often known as "the kidneys of the Earth", based on their incredible ability to clean and filter water as it flows through them. Not to mention BC's wetlands are worth over \$100 billion/year!

The team is dedicated to continuing to conserve wetlands through restoration and education projects throughout the province. If you are interested in learning more about the programs that we offer, please click here.

Thank you to Michele Halleran, property owner of the restoration site, for the beautiful photos. Additionally, a special thanks to our funders: Fish and Wildlife Compensation Program, Wildlife Habitat Canada, and Environment and Climate Change Canada, for making this project a reality.

These projects and partnerships were possible through the support of the following organizations:



Figure 2. Sample page from BC Outdoors Volume 74 issue 5 (September/ October 2018), where we discuss 2018 works events, including the Salmo Map our Marshes workshop. Funders are thanked at the end of the article.



Wetlands Program Diversifies In 2018: A Year In Review

By Jason Jobin, Wetlands Program Coordinator

EVERY YEAR IT SEEMS that the BCWF's Wetlands Education Program (WEP) is busier than the last but in 2018, rather than it being due to an increase in the number workshops, WEP has been busy diversifying to increase their impact across the province, industry, and government. They also kicked off a research project that may very well change how people restore wetlands in BC.



Neil Fletcher teaches the FREP Wetland Protocol near Vanderhoof.

LEARNING FROM THE PAST

Over the past decade, WEP has steadily been increasing its wetland restoration efforts (in 2018 alone, WEP restored over a dozen hectares) but has not had the resources to properly monitor and assess those efforts. Thankfully in 2018, with funding from Habitat Conservation Trust Foundation, WEP was able



Participants pose beside a new wetland created during the Wetlands Institute.

to complete Phase 1 of a comprehensive evaluation of past wetland restoration sites. 25 sites from Duncan to Canal Flats had their hydrology, vegetation, and soil assessed and compared to nearby reference sites to assess ecological lift. 2019's Phase 2, will return to those sites and conduct wildlife surveys for amphibians, mammals, and birds to determine how animals are using restored wetlands. Once processed, this data will culminate to strengthen best practices to inform future wetland restoration.

opportunities for free professional development and stewardship training. In response to this, WEP brought workshops to Fort St James, Vanderhoof, Mackenzie, Moberly Lake, and Smithers in 2018. Capacity building will help these communities better address development pressures and identify new restoration opportunities.

WORKING WITH FORESTRY

For years, BC Wildlife Federation's Wetlands Program has been advocating for the province to adopt a standardized wetland classification and health assessment form. Other provinces, such as Ontario have had these standards since the 90's, while Alberta adopted theirs in 2016. In 2018, WEP had a breakthrough and, through a partnership with the Government of BC, developed and taught a protocol to assess the health of wetlands as part of the Forest and Range Evaluation Program (FREP): a multi-agency program that evaluates whether forestry

practices are meeting government's broader intent for the sustainable use of resources. Though currently focused on forestry, this is a monumental first step and will have applications in broader wetland assessment.

CORE PROGRAMMING

Despite the initiatives listed above, WEP was still committed to delivering its pillar program training and outreach. 356 participants from Fish and Game Clubs, Non-Government Organizations, First Nations, Conservation Groups, Government, and more were educated through core workshops (ie. Working Group, Map our Marshes, Wetlandkeepers, and Wetlands Institute) and over 1150 students, children, and community members were enriched through outreach

events such as Nature Knowledge Fest. You will be able to learn more about the 2018 Wetlands Institute in the next issue of BC Outdoors so stay tuned!

The staff at the Wetlands Education Program is looking forward to the new year and continuing to be a voice for wetlands in British Columbia. Staff would also like to extend a thank you to our 2018 Funders. Without them, the Wetlands Education Program would not be possible. ○



WWW.BCWF.BC.CA • 11

Figure 3. Sample page from BC Outdoors Volume 75 issue 1 (Jan/Feb 2019). 2018 funders are thanked at the end of the article.

TOURING THE INTERIOR – A MAP OUR MARSHES DOUBLE FEATURE

Posted by Jasorjabin on June 4, 2018 · Leave a Comment (Edit)



Nimbly avoiding the mounting floodwaters, the Wetlands Education Program team was able to host two Map our Marshes workshops in Peachland (May 6th) and Salmo (May 30th); sandwiching a mélange of wetland site visits, presentations, and restoration prescriptions.

Held in partnership with the Peachland Watershed Protection Alliance, our first workshop began in the charming "Little

BLOG CATEGORIES

- BC Wetland Photo of the Month
- Outreach
- Species Profiles
- Wetland Stewards Continued Projects
- Wetlands Education Program
- Map Our Marshes
- Restoration Workshop
- Wetland Institute
- Wetlandkeepers
- Wild Kidz Camp
- Working Group Workshops



UPCOMING EVENTS AND COURSES

For more information on registration for courses and workshops, see our [Eventbrite page](#).



Teaching wetland classification at Erie Lake

You can see images of the Peachland workshop [here](#), and images of the Salmo workshop [here](#). Currently the Wetlands Education Program has no other Map our Marshes workshops planned for 2018, but other workshops like our Wetlands Institute are still to come. [Click here](#) to see our upcoming events.

The above workshops were made possible with the financial support of the following organizations:



Figure 4. Sample of blog article written about 2018 Map our Marshes workshops, including the Salmo workshop. The full article can be found at the following link: <https://bcwfbogblog.com/2018/06/04/touring-the-interior-a-map-our-marshes-double-feature/>



Figure 5. Sample tweet thanking FWCP and other 2018 funders.

Wetlands Update



The Newsletter of the BC Wildlife Federation's
Wetlands Education Program

2019 Edition

Draft



BCWF and FLNRO team up to assess wetlands in cutblocks (Photo: Lisa Nordin)

Forestry Enters the Fold

The Wetlands Education Program continued to extend its reach in 2018 by partnering with The Ministry of Forests, Lands, Natural Resource Operations & Rural Development (FLNRORD) to develop a new wetland assessment protocol for the Forest Range and Evaluation Program (FREP).

FREP is a program designed to assess the impact of forestry and range development on values (ex. cultural heritage, fish habitat, recreation), and inform best practices and policy. Some values, such as stream health, have been surveyed for over a decade, while wetlands remained unmonitored. BCWF helped create a new wetlands protocol and hosted workshops in Kamloops, Smithers, and Fort St. James to train FREP professionals on its use. BCWF also introduced the new FREP form during Wetlandkeepers Workshops to collect additional feedback.

Working on FREP was just one of the few projects the Wetlands Education Program worked on in 2018. Continue reading to learn about other 2018 projects and what workshops may be coming to your area in 2019.

In This Issue

Wetlands Institute

A 7-day workshop on

Salt Spring Island

Wetlandkeepers

Stewardship courses in Nanaimo,
Vancouver, Mackenzie, and more

Map our Marshes

Learning how to map small

wetlands with GPS units in

Peachland, Kamloops, and Salmo

Wetlands Outreach

Hundreds of BC residents

learn about wetlands at

schools and events

Restoration, Past and Present

Restoring new wetlands and

evaluating our past projects

Workshops in 2019

Mark your calendars!

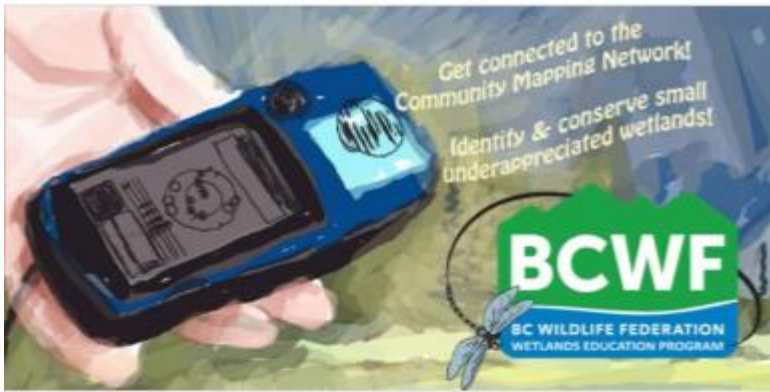
A Space For "Wetworking"

Keep up to date with our

"Bog blog" and more



Figure 6. The Wetlands Update is available free online, with printed copies distributed at all workshops and public events. The final page acknowledges FWCP and other funders. The current version is available at the following webpage: <http://bcwf.net/index.php/programs/wetlands>



Salmo Map our Marshes Workshop

When: 9:00am - 3:00pm, May 10th 2018

Where: Multi-purpose Room, Salmo Valley Youth and Community Centre (206 Seventh St, Salmo BC).

Cost: FREE! (\$50 value)



This workshop was undertaken with the financial support of: / Ce projet a été réalisé avec l'appui financier de:



Figure 7. Portion of registration page for the Salmo Map our Marshes Workshop

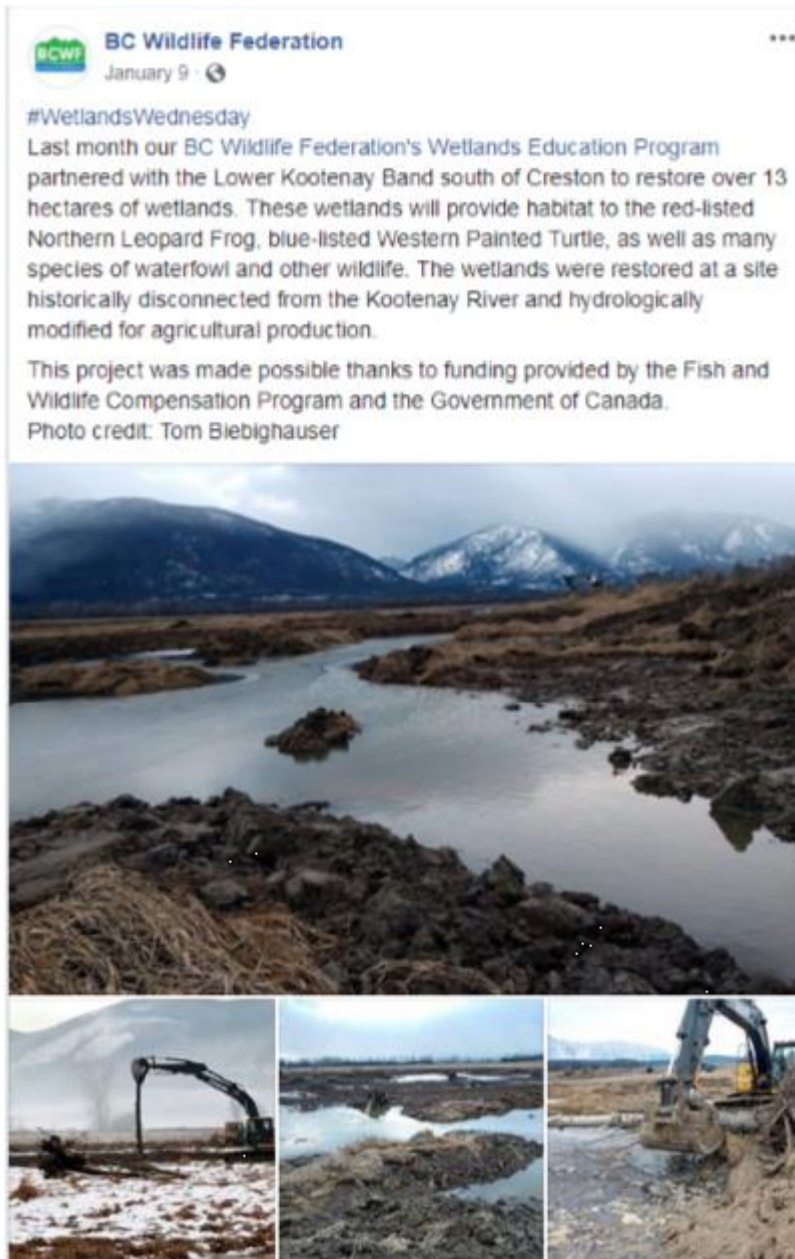


Figure 8. Sample of BCWF Facebook post thanking FWCP



Figure 9. Sample of a webpage on the BCWF website, thanking the 2018 funders

Wetlands Program Diversifies in 2018

A Year in Review

by Jason Jobin

Wetlands Program Coordinator



Neil Fletcher teaches the FREP Wetland Protocol near Vanderhoof

Every year it seems that the BCWF's Wetlands Education Program (WEP) is busier than the last. In 2018, rather than this being due to an increase in the number of workshops, WEP has been busy diversifying to increase their impact across the province, industry, and government. They also kicked off a research project that may very well change how people restore wetlands in BC.

Learning from the past

Over the past decade, WEP has steadily been increasing its wetland restoration efforts (in 2018 alone, WEP restored over a dozen hectares) but has not had the resources to properly monitor and assess those efforts. Thankfully, in 2018, with funding from Habitat Conservation Trust Foundation, WEP was able to complete Phase 1 of a comprehensive evaluation of past wetland restoration sites. 25 sites from Duncan to Canal Flats had their hydrology, vegetation,

and soil assessed and compared to nearby reference sites to assess ecological lift. 2019's Phase 2 will return to those sites and conduct wildlife surveys for amphibians, mammals, and birds to determine how animals are using restored wetlands. Once processed, this data will culminate to strengthen best practices to inform future wetland restoration.

Expanding farther north

If you have been following the Wetlands Education Program, you may have noticed its training progressing farther north; this year, it broke a new record by hosting one workshop in Tsay Keh Dene (a small community at the northern tip of the Williston Reservoir). Due to the distance from larger urban centres, many communities in the Skeena, Omineca, and Peace regions have limited opportunities for free professional development and stewardship training. In response to this, WEP brought workshops to Fort St James, Vanderhoof, Mackenzie, Moberly Lake, and Smithers in 2018. Capacity building will help these communities better address development pressures and identify new restoration opportunities.

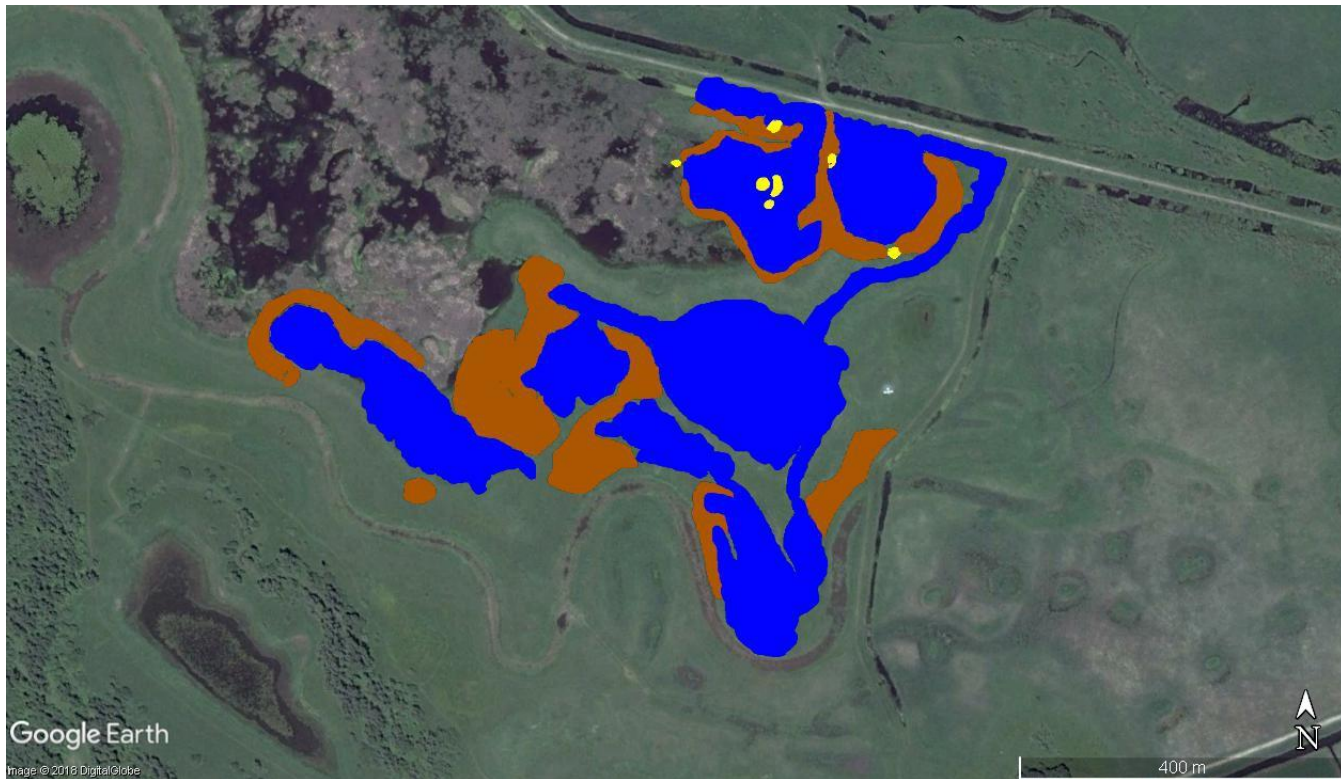
Working with forestry

For years, BC Wildlife Federation's Wetlands Program has been advocating for the province to adopt a standardized wetland classification and health assessment form. Other provinces, such as Ontario have had these standards since the 90's, while Alberta adopted theirs in 2016. In 2018, WEP had a breakthrough and, through a partnership with the Government of BC, developed and taught a protocol to assess the health of wetlands as part of the Forest and Range Evaluation Program (FREP): a multi-agency program that evaluates whether forestry practices are meeting government's broader intent for the sustainable use of resources.

Figure 10. Sample page from Western Woods and Waters, which discusses FWCP-funded activities. The issue can be found at the following link:

<http://westernwoodsandwatersmagazine.com/Magazines/BCWF/JanFeb2019/>

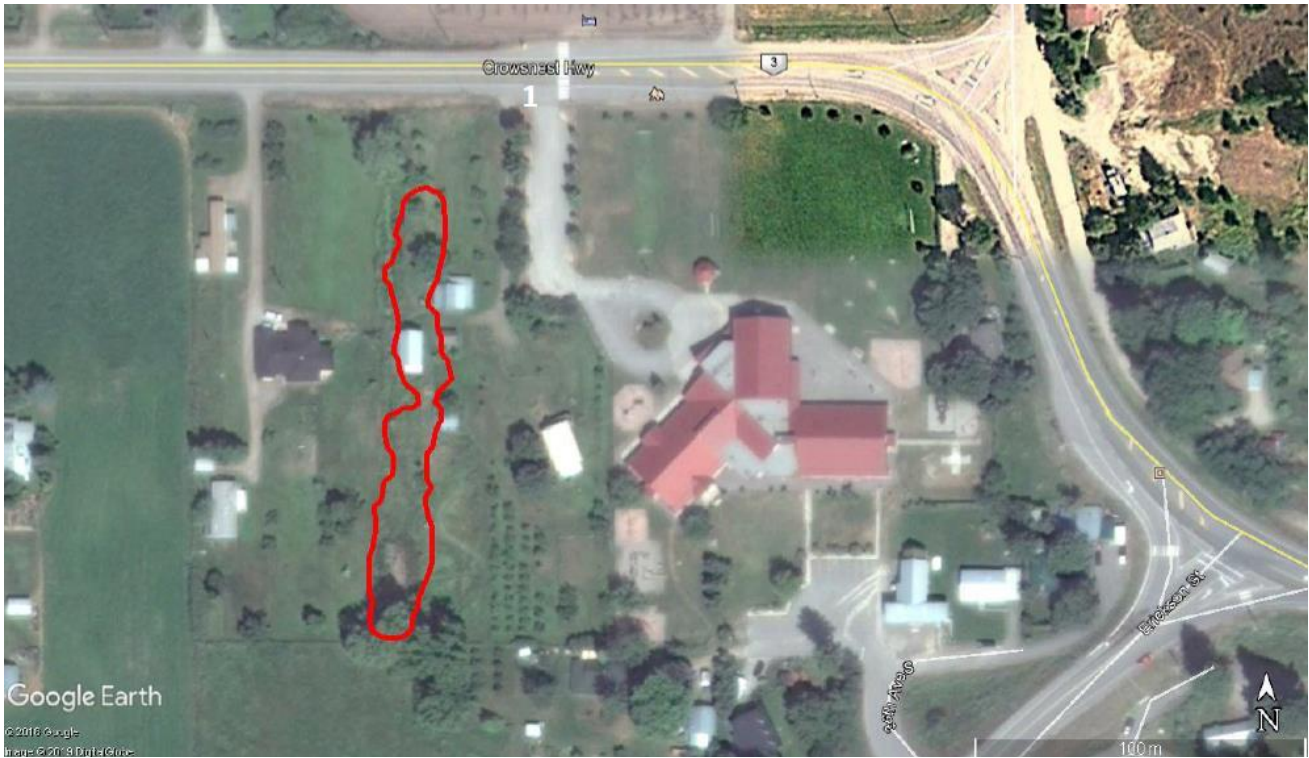
Appendix A: Maps and images of restoration projects



1. Satellite image showing areas restored on Yaqaan Nukiy Lands with Blue representing the wetland habitat, Brown the upland habitat, and Yellow the turtle nesting areas.



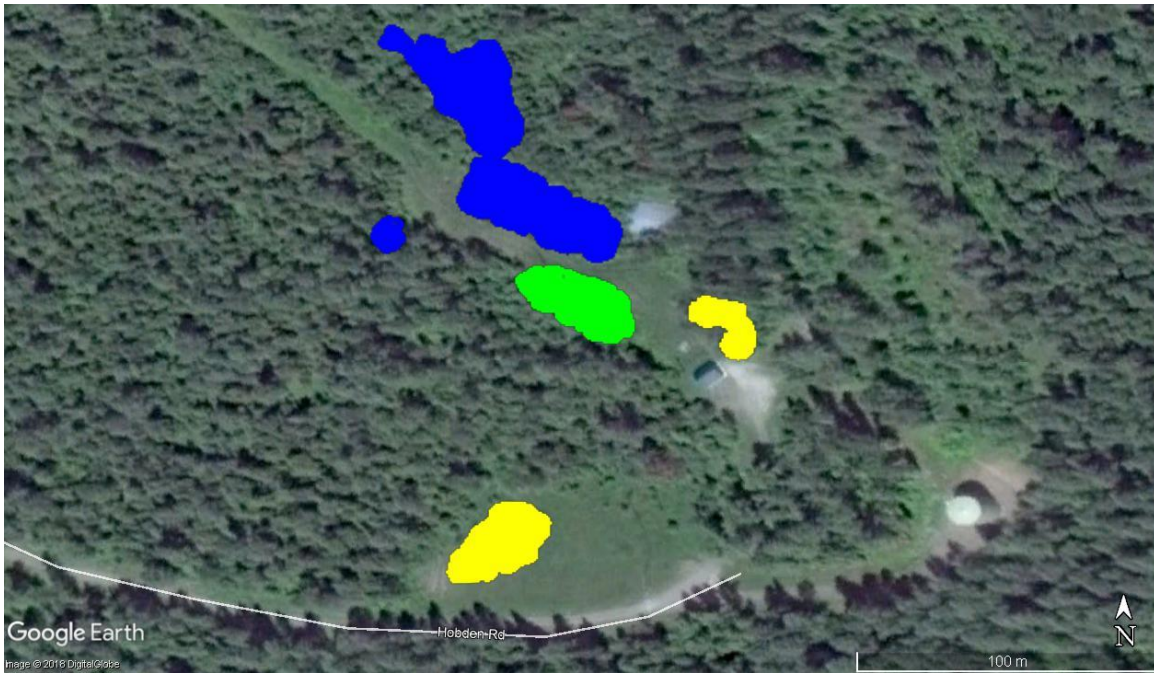
2. Portion of habitat restored on Yaqaan Nukiy Lands



3. Satellite image showing the stream and wetland habitat restored at Erickson Elementary in red. Note, the buildings within the red polygon were removed prior to construction when the school took ownership of the property.



4. A portion of the stream restored at Erickson Elementary, which features logs placed for students to cross.

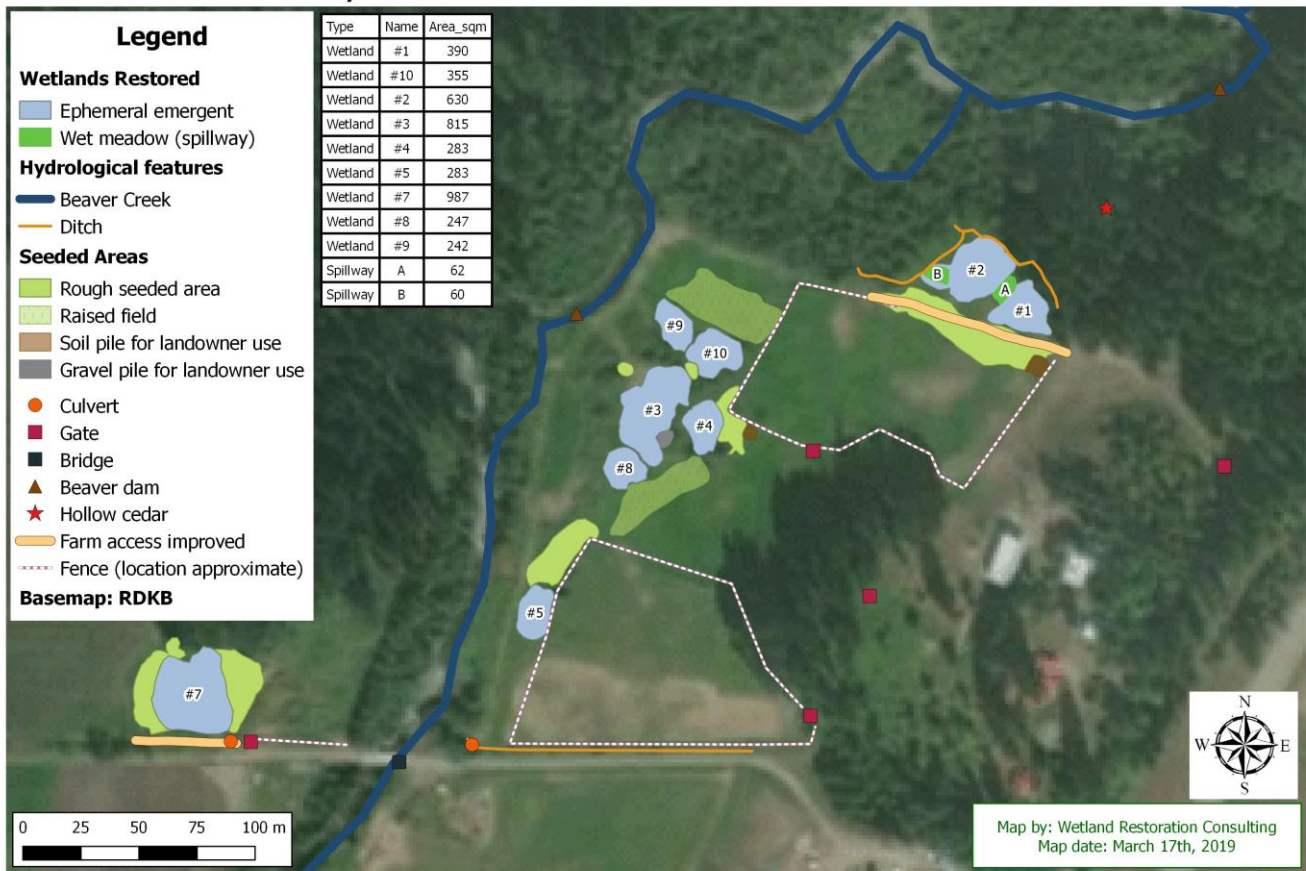


5. Satellite image showing areas restored at Lister Creek. Blue indicates the wetland and riparian area restored, green the forested wetland restored, and yellow the turtle nesting areas created.



6. The outlet of the large constructed wetland following the removal of the dam. Large boulders were buried across the riparian area, and a wide floodplain was restored to control erosion and head-cuts. The large log was placed for wildlife and people to cross the stream.

Haywire Ranch Wetlands Restored in 2018



7. Satellite image showing wetlands restored on Haywire Ranch, represented in blue.



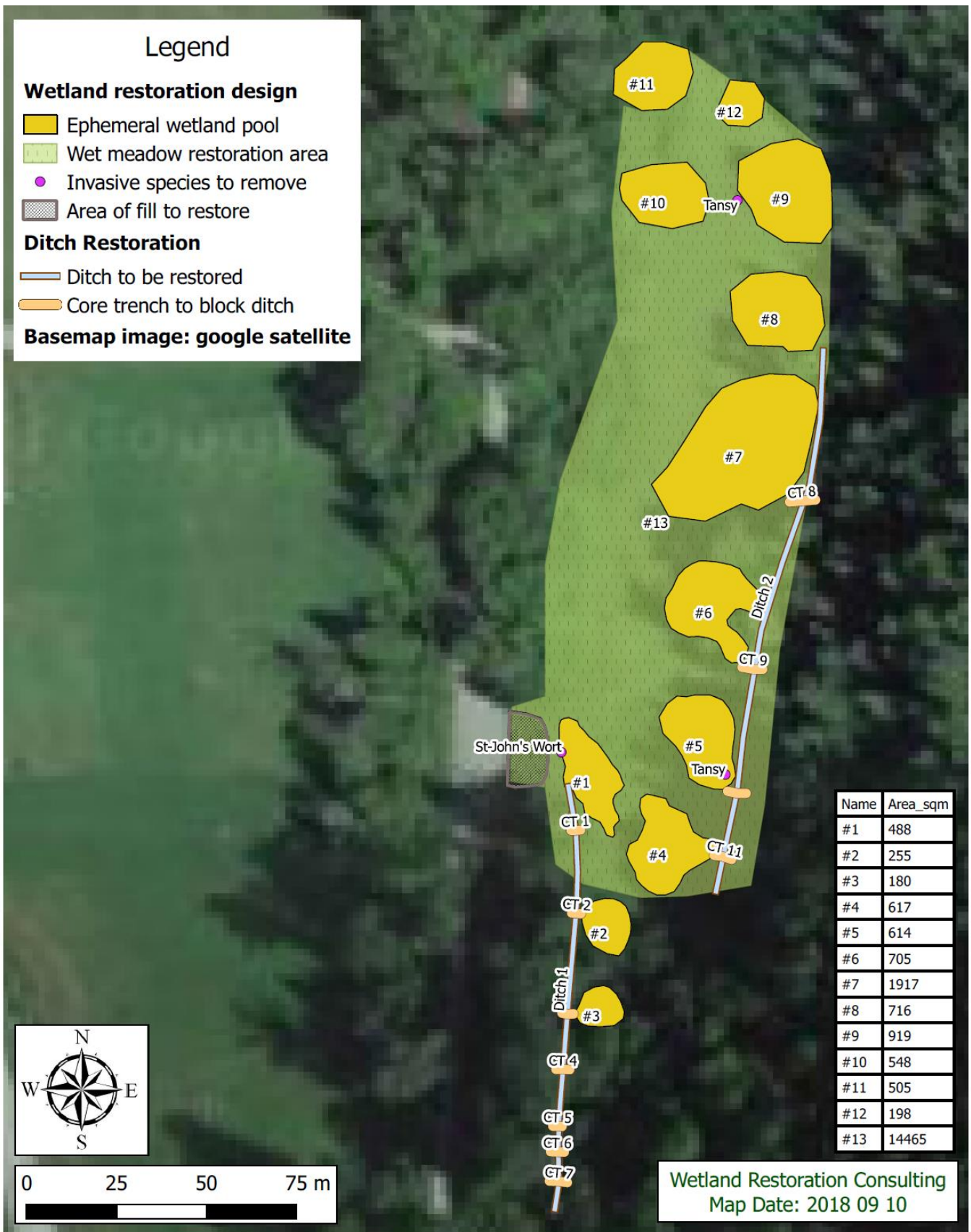
8. One wetland restored on Haywire Ranch beginning to fill with water



9. Satellite image of works completed on Elk Spike Farm with blue depicting the wetland habitat restored and green depicting where excavated soils were spread.



10. Dozer spreading topsoil during restoration at Elk Spike farm



11. King George VI Provincial Park restoration design map

King George IV Provincial Park Wetland Restoration Design Report



Prepared for the BCWF Wetlands Education Program & BC Parks

Robin Annschild

March 29th, 2019

Revised April 24th, 2019

12. Restoration Design Report for King George VI Provincial Park. Full report can be found at <https://drive.google.com/file/d/1esQOK8Pc8rBiiGKFgowN9CDTWLsRI4JX/view?usp=sharing>