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Kootenay Connect: 7CW Columbia Wetlands: Restoration of Habitats and Species at Risk in the Columbia Valley: Year 7 (2025-2026) & Summary Report (2019-2026)

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7CW Summary overview of projects in Columbia Valley: Year 7 (2025-2026) & Summary Report (2019-2026)

By

Dr. Suzanne Bayley, Catriona Leven, Dr. Ryan MacDonald, Rachel Darvill, Brian Gustafson, Jessica Holden, Beth Millions, and Rick Hoar

The Columbia Wetlands Stewardship Partners (CWSP) received funding from Kootenay Connect ECCC for four projects in the Columbia Valley, BC in Year 7. The projects in year 7 of the KC/ECCC projects continued the work from the years 1-6, providing more detailed science, more on the ground conservation actions, and more community involvement. It also included a summary and analysis of all the data and a cumulative synthesis of conservation actions and benefits to conservation. In addition to the 4 projects, we briefly summarize several other conservation activities done in earlier years.

In year 7 we had the following projects:
7CW Western Painted Turtle and SAR (7CW WP Turtle & SAR) shows the conservation actions that benefit Western Painted Turtle, American Badger, Lewis's Woodpecker, and Osprey.
7CW Conservation & Mitigation of Wetland Basins Vulnerable to Drought (7CW Hydro & Beaver) is composed of 5 main subprojects: A.) restoration of degraded beaver dams to restore wetlands in the uplands of Columbia Valley, and pre and post environmental assessment of 11 sites (25 beaver dam analogues) where restoration has occurred, B) assessment of the impact of beaver dams in the Columbia Wetlands, C) assessment of wetlands and natural beaver dams in the grasslands west of Columbia Lake, D) development of a Wetland Restoration Feasibility Index to determine where wetland restoration activities are likely to be successful. E) hydrological evaluation of wetland vulnerability to climate change in Columbia Wetlands. These are listed below in the Executive Summaries as A - E.

7CW (7CW Conservation Lands) has two subprojects, one of which identified and ranked important biodiversity hotspots in riparian and upland habitat in Columbia Valley (CV). It has identified and prioritized key parcels with conservation opportunities for SAR and species of interest on private and public land adjacent to the CWWMA. The second subproject has collaborated with Farmland Advantage and Windermere District Farmers' Institute (WDFI) to work with two landowners to develop Environmental Farm Plans and provide on-the-ground fencing and stewardship prescriptions on two properties at the north end of Columbia Lake.

7CW Conservation of Cottonwood Trees in Columbia Wetlands (7CW Cottonwoods Project) protects important wildlife trees from harvesting by beavers. It includes monitoring and mitigating the impact of beaver on cottonwood/aspen stands and includes the installation of wire guards on important cottonwood trees in Columbia Wetlands.

Projects In 2019-2021 created the foundation of knowledge for the subsequent year's enhancement, research and restoration actions. These include acquisition of LiDAR for the Columbia Wetlands, and vegetation mapping of Columbia Wetlands.

Our projects aim to raise awareness around species at risk in the Columbia Valley and to enhance, restore, and manage the large riparian and wetland complex of the Columbia Wetlands and Valley to support the recovery of target species at risk. Here are the executive summaries from the **7CW Columbia Wetlands: Restoration of Habitats and Species at Risk in the Columbia Valley** with subproject reports attached.

Executive Summaries:

1. 7CW Western Painted Turtle and SAR (7CW WP Turtle & SAR)

From 2019 to 2026, the Columbia Wetlands Stewardship Partners, through the Kootenay Connect initiative, implemented multi-species conservation actions across the Columbia Valley to protect Species at Risk, secure critical habitat, and improve landscape connectivity. These efforts combined targeted habitat inventories, regulatory habitat protection, stewardship actions, and infrastructure assessments to support long-term species persistence in one of British Columbia's most ecologically significant valley-bottom landscapes.

Between 2021 and February 2026, a total of 13 Wildlife Habitat Areas (WHAs), representing 718.1 hectares, and 1,258 Wildlife Habitat Features (WHFs)—including 1,255 functional American Badger burrow clusters and three Mountain Goat mineral licks—were approved or submitted to the Province of British Columbia. These habitat protection measures represent a major expansion in formally recognized Species at Risk habitat on provincial Crown land in the region. However, not all WHAs have been legally established to date, and advancement from proposal to formal designation is dependent on provincial review processes and administrative capacity. American Badger WHA proposals account for 237.6 hectares of burrow habitat across Rushmere, Steamboat Mountain, Dry Gulch, and Findlay Creek. In addition, 480.5 hectares of rare Alkali Saltgrass ecological communities were formally reviewed and incorporated into the provincial proposed WHA layer, representing a significant step toward long-term protection of these sensitive and rare ecosystems.

American Badger inventory efforts conducted between 2022 and 2025 documented 6,178 burrows, including 4,593 functional burrows clustered at 1,351 locations, with 1,255 functional burrow clusters eligible for protection as Wildlife Habitat Features. At Findlay Creek alone, inventories conducted in 2024 and 2025 documented 3,319 burrows, including 2,525 functional burrows clustered at 728 locations, confirming the site as the most significant badger habitat area known in the study region. Two WHAs totaling 82.2 hectares were developed, which if approved, will help to protect this high-density burrow network and associated habitat.

To address habitat fragmentation and road mortality risk to badger, 54 culverts along Highway 93/95 were assessed, resulting in 106 individual culvert-end evaluations. Only 45 culvert ends (42%) were fully open, while nearly 60% were partially or fully blocked, limiting wildlife movement. Six culverts were identified as high priority and 17 as medium-to-high priority for wildlife crossing potential. Remote wildlife cameras deployed at five culverts confirmed American Badger use at three of those culverts, documenting repeated crossings and confirming that existing infrastructure can facilitate safe wildlife movement. Cameras also recorded multiple additional wildlife species, including coyote, river otter, striped skunk, snakes, and Columbian ground squirrel. This demonstrates the broader ecological importance of maintaining functional and permeable culverts to reduce wildlife road mortality and highlights a cost-effective alternative to constructing new and costly wildlife crossing structures.

Western Painted Turtle conservation efforts between 2020 and 2025 included installation and maintenance of predator-exclusion fencing, artificial nesting habitat, basking structures, and effectiveness monitoring. In 2025, remote cameras documented 199 turtle observations, including 8 confirmed nesting events, several prospecting events at created nesting beds, and 76 road crossings, demonstrating use of enhanced nesting areas while highlighting ongoing road mortality risks. Nesting enhancements supported continued recruitment and improved population structure at monitored sites.

Lewis's Woodpecker monitoring conducted between 2020 and 2025 documented 47 active nests at 31 unique locations, improving understanding of nesting distribution within the Columbia Valley. The maximum number of active nests recorded in a single year was 13 (2024), exceeding the threshold of 12 nests required to trigger Key Biodiversity Area designation. Of the 31 unique nesting locations, 9 occurred outside federally designated Critical Habitat, highlighting gaps in existing habitat protection. Six nesting occurrences were documented in three individual hydro poles, underscoring the importance of coordinating with infrastructure providers to retain nesting substrate where feasible. These actions represent an important opportunity to mitigate infrastructure-related habitat loss for this threatened species.

Osprey monitoring conducted between 2020 and 2025 documented 76 nests in 2025, including 45 occupied nests during the early breeding season (59% occupancy) and 25 nests with confirmed chick production, demonstrating continued reproductive success and the importance of artificial nesting platforms. Monitoring also identified nesting platforms requiring repair or replacement, allowing targeted maintenance needed to support ongoing nesting success.

Collectively, if all WHA applications are approved, this project will have secured protectionary measures for over 718 hectares of at-risk habitat, in addition to 1,258 discrete WHFs. The project has also documented extensive use of protected habitats and wildlife crossing structures and generated one of the most comprehensive datasets on American Badger habitat and connectivity in the Columbia Valley to date. Additionally, nesting locations were documented for Lewis's Woodpecker; documented and enhanced for Osprey and Western Painted Turtle. These outcomes represent a substantial advancement in Species at Risk conservation in the Columbia Valley and provide a strong scientific and regulatory foundation for future habitat protection, stewardship, and connectivity initiatives, while highlighting the importance of continued provincial capacity to advance habitat protection proposals to formal legal designation.

In 2020, Darvill (2022) collected and summarized all the information on Species at Risk and concern in Columbia Valley and included the information in the report "Literature Review of Species at Risk in the Columbia Valley" The study determined that a total of 65 species at risk (SAR) species and 21 ecological communities at risk are found within the study area: These included • 35 bird species • 2 amphibian species • 2 reptile species • 9 mammal species • 7 vascular plant species • 2 fish species • 6 invertebrate species • 1 fungus and 1 lichen species • 21 ecological communities. All known spatial occurrences for SAR were entered into excel tables that were subsequently converted into maps (using ArcGIS), to provide a detailed overview of the spatial occurrence for each SAR in the Columbia Valley.

2. 7CW Upland Wetlands Restoration Report yr 7 and 3 yr summary (7CW Beaver /Hydro)-A

In the western benchlands of the upper Columbia Valley BC, CWSP has used a combination of in-person fieldwork, drone photography, and modeling to study the wetlands, lakes, and streams since 2023. These observations have allowed us to better understand the status of these wetlands, threats facing them, and to identify wetlands that we can restore using beaver dam analogues (BDAs). Altogether we restored 35.05 ha of wetlands in the benchlands of CV and developed 2 approaches to assess the potential success of wetland restoration.

To assess the status of wetlands and shallow lakes across the landscape, CWSP assessed 371 of the 828 (45%) mapped wetland and lake polygons in the BC Provinces' Freshwater Atlas (FWA). We visited 227 wetland (47%) and 144 lake (41%) FWA polygons via drone or in person between May and September 2023. We used a combination of geographic information system (GIS) resources, in-person observations, and photographic imagery to assess potential sources of water, landscape position, and dominant vegetation types. We then used the drone photograph inventory to broadly classify the vegetation communities based on the "wetness" present in each FWA polygon. The dominant groundcover observed (i.e., open water, wetland vegetation, shrubs, deciduous or coniferous trees, mudflats, or dryland vegetation) was used to determine a 'wetness' index, which followed four categories: Adequately Wet, Mostly Wet but Drying, Drying with wetted areas, and No Signs of Water.

In 2025 we validated the 2023 drone wetness classification by visiting 38 wetlands that had been assessed with drone photographs, and assessed the sites based on wetland vegetation, disturbance, landscape location, and water source. We determined that 24 of 38 wetlands had the same vegetation observations and wetness index ratings. To further improve the correlation between drone and in-person assessment, we corrected differences in how the shrub community was assessed (by drone), and differences in timing of when the sites were examined. These showed that we had an 80% agreement between the drone and in-person estimation of the "wetness" of the wetland. This suggests that we can use a drone to examine a larger number of wetlands to assess the effect of climate change and to select wetland sites for potential restoration.

Thus, this method of categorizing wetland vegetation and wetness is effective, but has limitations, and in-person observations should be incorporated for calibration. Drone imagery collected during field surveys provides a useful overview of the wetland landscape, but interpretation still benefits from ground-based knowledge of the ecosystem.

In 2024, MacHydro Consultants, in collaboration with CWSP, developed a Wetland Restoration Feasibility Index for wetlands on the western benchlands of the Columbia Valley. The index provides a desktop indication of whether an individual wetland can be successfully restored. Our work has shown that an available water supply is the key issue for many small wetlands in the region. The Wetland Restoration Feasibility Index is based on a Wetness Index, an Inflow Index, and a Precipitation – Evapotranspiration Score for 443 wetlands on the western benchlands. The Wetland Restoration Feasibility Index found that many wetlands on the western benchlands have low or moderate restoration feasibility, while far fewer have a high or very high potential to be restored successfully.

In 2025 to provide a validation of the Wetland Restoration Feasibility Index CWSP ground-truthed this Index by visiting 52 wetland sites included in the analysis, and recoding water source, water quality, vegetation, wetland position on the landscape, and signs of drying (if any). From our observations, we believe that the 2024 version of the Wetland Restoration Feasibility Index overestimated restoration feasibility in some sites. We found 22 wetlands ranked High or Very High by the Index, which we ranked as Low or Moderate based on field observations, mostly due to a lack of water source. 25 of the wetlands visited had Wetland Restoration Feasibility Index assessments that matched our field assessments. The provincial database for some of the hydrologic data may be outdated. This has led to a revision of the Wetland Restoration Feasibility Index and changes in the databases used to develop the index. This is presented below and in the report titled "*Restoration Index for Bench Wetlands in the Upper Columbia Valley – 2026 Update"*.

In 2023, CWSP identified ten wetlands as potential sites for wetland restoration using Beaver Dam Analogues (BDAs). In 2024, we monitored these sites for pre-restoration data, and in September 2024 we built 4 BDAs in 2 wetland sites. In 2025 we built 21 BDAs and 7 Post Assisted Log Structures (PALs) across four wetland sites and continued effectiveness monitoring and identified additional potential restoration sites which we have submitted permits for approval. In 2026, we plan to build 56 BDAs and 11 PALs across five wetland sites.

In total in 2024 and 2025 we constructed 25 BDAs and 7 PALs and restored the habitat in 35.05 ha of upland wetlands. The BDA construction in 2024 restored 12.49 ha of wetland in Beaver Channels and 1.17 ha of wetland in S-Land. The 2025 construction restored 5.47 ha, 3.89 ha, and 1.03 ha of wetland in Northbound, Big Dam and Limbo Sites, respectively. In the Double Dam site, due to dry conditions there was no immediate increase in water within the wetlands, but we anticipate restoration of 10.89 ha of wetland. Both 2024 and 2025 were dry years and yet most sites still retained water after construction. We anticipate that increased water in all these systems in spring will result in more water being retained at all sites, which will be documented in the April surveys. A map of the BDA sites is shown below. We monitor 13 upland wetland sites, eleven as restoration sites and two as reference sites. Our primary metric of pre- and post-restoration change is water level. We also map broad scale vegetation communities, open water area, and monitor water quality, breeding birds and detailed vegetation plots. In all breeding bird surveys in all wetland sites, we observed 90 species in 2024 and 2025 of which 25 are wetland dependent and six are wetland associated. Given the large difference in bird species and numbers between wetlands and between years, we hypothesize that bird use of these small benchland wetlands is quite stochastic, with limited site fidelity. There is also high biodiversity in vegetation in the wetlands. In all vegetation plots in all wetlands, we observed 145 species of plants. Despite it being only one year after the construction of BDAs in 2024, we observed differences in vegetation plots in both wetland sites in 2025. This large plant list shows how diverse these small benchland wetlands can be, with many differences between individual wetlands even if they superficially appear similar.

A major opportunity for conservation groups to mitigate drought and a warming climate is to build BDAs to retain water on the land and to restore degraded wetlands and damaged streams. This has been a major challenge because the regulations associated with BC's Water Sustainability Act are not designed for conservation actions.

3. 7CW Assessment of the impact of beaver dams in the Columbia Wetlands (7CW Beaver/Hydro)- B

CWSP has been monitoring the water levels, vegetation, waterbirds and water quality of the Columbia Wetlands in Columbia Valley, East Kootenay, BC. Little knowledge was available on the hydrology and ecology of the Columbia Wetlands prior to the Kootenay Connect project. We found that individual floodplain wetlands can be categorised hydrologically based on their connection to the flood pulse of the Columbia River as Most, Partially, and Least Connected. Those wetlands that are Most Connected to the Columbia River (CR) have channels (gaps) through the natural levees which allow input of flood waters when the CR rises during the spring melt in June and drain out again when the CR levels drop in autumn. Least Connected wetlands are only filled with water when the water goes overtop the natural levees (and beaver dams). The water is retained over the winter into the following spring. Partially Connected wetlands have gaps in the natural levees which allow some floodwaters to enter but are partially blocked by beaver dams or debris.

We found that the interaction between the flood pulse of the Columbia River, the natural levees which bound the wetlands, and beaver dams explains 60% of the hydrological variation between these wetland groups. 46% of sampled wetlands in the Partially and Least Connected groups had beaver dams controlling water levels. Across the whole 18,000 ha* Columbia Wetlands floodplain, 74% of wetlands are in the Most Connected group, while only 26% are Partially or Least Connected wetlands. This means that most of the wetlands drain out over the winter when the water levels of the Columbia River fall. Beaver dams are important for retaining water in the wetlands over winter and early spring before the spring melt in May and June.

By monitoring water levels for six years, we have water level data for three high water years (2020, 2021, and 2022) and three low water years (2023, 2024, and 2025). There are cumulative impacts of successive low water years on wetlands, with successive years having increasingly reduced peak and low water levels. Partially Connected wetlands appear to be the most at risk wetland group; in high water years, the average low water level is approximately 1 m, but in low water years the average low water level is approximately 0.5 m. The differences between these years emphasises the importance of multiple years of data for large complex systems like the Columbia Wetlands. We also used isotope analysis to determine relative contributions of river water, groundwater, and precipitation to different wetlands throughout the year, finding that groundwater contributes most in the spring and fall while in the summer river water dominates.

We have also studied ecological differences between wetland groups. Both emergent and submerged vegetation differs between wetland groups, and migratory bird use of the wetlands also differs. Partially and Least Connected wetlands support a higher species diversity of migratory waterbirds in the spring, as they retain water over the winter and so provide open water habitat in early spring when these bird species are migrating through the Columbia Wetlands. Partially and Least Connected wetlands provide habitat for species that need deeper, stable water, while Most Connected wetlands provide habitat for birds that prefer shallow water and muddy edges. All wetland groups support similar numbers of individual birds in the spring, and in the fall there are no significant differences in either numbers of birds or numbers of species in the different wetland groups. In spring, we observed between 4,800 and 7,500 individual birds across all wetland sites, and in fall between 8,600 and 14,200 individual birds across all wetland sites. Across four years of bird surveys, we have observed more than 62,000 individual birds.

In 2022, we began to look at using Beaver Dam Analogues (BDAs) as a restoration technique to restore selected wetlands, where natural beaver dams had blown out or been removed by humans, to increase the amount of Partially Connected wetlands within the floodplain. However, this has proved difficult to implement due to permitting requirements by the provincial government.

4. 7CW Beavers Maintain Wetlands in a Dry Region: Wetland Complexes West of Columbia Lake (7CW Beaver/Hydro)-C

In 2024-2025, CWSP conducted two areas of study in wetlands on the upland bench west of Columbia Lake. In this dry area west of Columbia Lake, we found that most wetlands were dry or had very little water. The only real wetlands found were associated with beaver dams. In total we found 81 beaver dams of which 44 were actively maintained. These complexes made up approximately 38.5 ha of open water, marsh and swamp habitat, which were the only significant wetlands and water bodies in the entire region.

This area west of Columbia Lake was identified in previous work as particularly vulnerable to climate change. There are 21 wetland polygons and 24 lake polygons mapped in this area by the BC Freshwater Atlas. We first visited 17 wetland polygons and conducted vegetation and soil surveys in collaboration with The Nature Trust of British Columbia, concluding that only two of these wetlands had a permanent hydroperiod resulting in year-round water, with 12 of these wetlands not being associated with a stream or lake, meaning that they are particularly vulnerable to drying.

We conducted more detailed surveys of beaver dams/lodges in the Upper Marion Creek West Wetlands and found 45 beaver dams, 24 of which were active, and nine beaver lodges, five of which were active. In 2025, we returned to finish these surveys and found a further 12 dams, of which eight were active. In this area there are therefore 57 beaver dams, 33 of which are being actively maintained by beavers. The largest dam was 122 m long and the shortest 1 m long.

These active dams hold approximately 36,941 m^3 of water on the landscape, create 23.20 ha of open water, marsh, swamp, and fen wetland habitat, and help regulate the flow and temperature of Marion Creek, all of which increases biodiversity and is important for species such as the provincially Blue-listed listed and designated as Special Concern under COSEWIC Westslope Cutthroat Trout (*Oncorhynchus clarkii lewisi*) found in Marion Creek. Given the lack of permanently inundated wetlands in this area, these wetlands and the beaver dams that maintain them are particularly important in providing wetland habitat and water on the landscape.

In 2025 we also surveyed the beaver dams and lodges in the wetland complex approximately 1.5 km north-east of the Upper Marion Creek West Wetlands complex. We called this the Powerline Wetland Complex. We found 24 beaver dams, 11 of which were active, and two beaver lodges, one of which were active. The longest dam was 340 m long, and the shortest 1.2 m long. These dams were holding approximately 12,790 m^3 of water on the landscape, and maintaining 15.30 ha of wetland habitat, including open water, marsh, and swamp. Local knowledge had told us that these wetlands seemed to be drying, which we found to be true. 13 of the 24 beaver dam created wetlands surveyed showed signs of drying such as visible drawdown, dying wetland vegetation, and increasing dryland vegetation. Our field assessment was that these wetlands are drying, for a variety of reasons, including inactive beaver dams, diversion of water by a human constructed ditch taking water south out of the area, and overall drying of this area.

5. 7CW Wetland Restoration Feasibility Index for Bench Wetlands in the Upper Columbia Valley – 2026 Update (7CW Beaver/Hydro)-D

Wetlands provide critical ecosystem services, including helping mitigate the effects of climate change by sequestering (taking up) carbon and buffering the impacts of climate change on water resources. Wetland numbers are decreasing globally and are expected to decline further due to climate change. Within the Upper Columbia River Valley, an area that is internationally recognized for its important wetland ecosystems, wetlands have been drying out. The Columbia Wetland Stewardship Partners (CWSP) are working to restore these wetlands and improve their ability to hold water with the use of beaver dam analogues (BDAs). As little is known about the hydrology of these wetlands, prioritization of wetland restoration is a challenge, but is an important first step. As wetlands are ecosystems that are highly susceptible to the effects of climate change due to their reliance on local hydrology, not all wetlands can survive the impacts of climate change. Given limited resources, it is important to prioritize wetland restoration efforts.

We developed a simple restoration feasibility index to help score wetlands based on their likelihood of long-term restoration success. We use publicly available data to develop an approach that can be adapted for other areas. Geospatial analyses were used to calculate watershed-scale measures from digital elevation models (DEMs). Additionally, measures for how dry a region might be, taken from climate data to simulate precipitation minus evapotranspiration (P-ET) were used. In total a flow accumulation index, a wetness index and a P-ET index were combined to create the restoration feasibility index, which ranks wetlands as having low, moderate, high, or very high potential to be successfully restored. The index was verified against field data during the summer of 2025 and was updated to improve its predictive powers. The index assessed various combinations of optimization and validation on the categories of low, moderate, high and very high restoration potential. When all 4 categories were considered, the index ranking compared to the field validation ranking score was 31/51 (60.8%). Simplifying the index to consider it as a go/no-go assessment where low rated wetlands should not be considered for restoration and moderate, high, and very high can be considered for restoration, the wetland restoration index correctly predicts the field results for 37/51 wetlands (72.5%). Thus the index can provide a reasonable desktop approach to help select wetlands where the restoration activities will be more likely to be successful. The index values are derived from publicly available data and can help practitioners prioritize wetland restoration efforts. Results from the wetland restoration index can be viewed at the link below:
http://columbia-wetlands.s3-website-us-west-2.amazonaws.com/

6. 7CW Hydrological vulnerability of Columbia Wetlands BC to climate change (7CW Beaver/Hydro)-E

Wetlands are important ecosystems that provide several critical hydrological functions, including flood and drought mitigation through water storage, infiltration, and groundwater recharge. However, due to their dependency on the hydrologic cycle, wetlands are highly sensitive to changes in local hydrology caused by a changing climate and studies have found that North America could lose 10% of its wetland area because of climate change. Within the Upper Columbia River Valley there are approximately 26,000 ha of floodplain wetlands, recognized as being of international importance under the RAMSAR Treaty. These wetlands have already experienced drying and loss of their wetted area, which is of great concern given their importance ecologically.

Snow accumulation and melt play an important role in shaping the Columbia River and the Columbia Wetlands as the Columbia River is a nival (snowmelt driven) system. The Columbia Wetlands are dependent on spring snowmelt to create a freshwater pulse that overtops levees and refills the wetlands. Wetland recharge from groundwater is also driven by snowmelt, where water sources are below the surface. Climate change is predicted to cause an increase in air temperatures, leading to a reduction in snow accumulation and an advancement of melt across the region.

Monitoring data from the Columbia Wetlands were used in this study investigated the relationship between snow water equivalent (the amount of water in the snowpack) and average wetland water level over the period from 2020 to 2025. We found that maximum winter snow water equivalent was significantly related to average wetland water levels, with a very strong relationship. Snow water equivalent predicted average water levels even better than maximum annual streamflow, suggesting seasonal snowpack is critical for providing source water to the Columbia Wetlands.

Snowpack was simulated in this study using the Raven Hydrological Modelling Framework, where long-term snow simulations from 1985 to 2099 were conducted on a daily time step. Daily snow water equivalent was subsequently used as an input to a statistical model to evaluate change in average water level for the Columbia Wetlands. The analysis suggests the Columbia Wetlands have been drying in recent decades and that this drying trend is expected to continue under modest greenhouse gas emissions and more extreme emissions. Furthermore, results from this study suggest average wetland water levels could approach zero in the later part of the century, indicating the maintenance and enhancement of this important area is critical to preserve ecological functioning.

7. 7CW Conservation Lands Subproject 2019-2026 (7CW Conservation Lands)

Over the course of the project, a number of actions were taken to support the work of property analysis and valuation within the Columbia Valley. Mapping of public and private parcels adjacent to the Columbia Wetlands Wildlife Management Area (CWWMA) began in 2019 and outputs have been updated and further automated to assess a greater number of properties in the area of interest than were previously possible when property assessments were manually completed. Ranking, scoring, and attributes used to assess BCOs have been updated and adapted over the project to improve the valuation of BCOs at site and landscape scales. Up to date mapping related to species at risk, wildlife habitat features, and wildlife habitat areas were incorporated and are reflected in recent analysis. The top 33 ranked properties valued using the BCO database and analysis developed throughout this project are presented in this report, in addition to the valuation of public lands.

Following up on the ranking process developed for private land, a similar approach was applied to the non-surveyed lands in the region to identify public land that could be prioritized for enhanced protection through legislative means. The landscape was evaluated using a 2 km × 2 km grid to create consistent spatial units for analysis. Ecological variables from multiple datasets were summarized and scored within each grid cell to produce an overall conservation value. Spatial clustering was then used to identify groups of adjacent high-value cells, highlighting areas with stronger potential for conservation opportunities across the landscape. and a video (Access Management in the Columbia Wetlands video) was produced detailing previously completed works proposing scientifically-backed access management areas.

8. 7CW Conservation of Cottonwood Trees in Columbia Wetlands Subproject (7CW Cottonwoods)

Over the past 7 years, the “Conservation of Cottonwood Trees in Columbia Wetlands: Saving Important Wildlife Trees” Project has focused on protecting large, mature cottonwood and aspen trees in the Columbia Wetlands that are at high risk of beaver damage. These trees are critical to other wildlife species as well, providing nesting, roosting, and foraging habitat for birds and bats. Building on earlier years of work, Year 7 emphasized installing additional wire guards on identified high-value cottonwood stands to ensure the long-term persistence of these important habitat features. We installed wire guards on 36 wildlife trees in 2025, of which 10 were in the Parson Nicholson area, 13 were south of the Parson bridge and13 were in the Spillimacheen area.

The overall conservation goal for this focal area was to maintain and enhance cottonwood and aspen habitat in the Columbia Wetlands, ensuring the continued availability of large wildlife trees despite ongoing beaver activity. Specific project goals included:

- Using CWSP wetland mapping to locate sites of large mature stand of cottonwoods and aspens.
- Protecting mature cottonwoods and aspens with known or high potential wildlife use (i.e., nests, cavities, loose bark, etc.).
- Evaluating the effectiveness of wire guards installed in previous years
- Identifying new priority cottonwood trees and stands for future conservation action.

A total of 192 important wildlife trees has been wrapped with wire guards in various locations throughout the Columbia Wetlands between Golden and Radium Hot Springs. Surveys have been completed both on foot and by canoe to document beaver activity, locate high-quality wildlife trees, and wrap the trees with wire guards. The standardized methods used for wrapping the trees were designed to accommodate tree growth.

Results from this project confirm that the wire guards remain an effective, low impact method for protecting cottonwood and aspen trees from beaver damage in the Columbia Wetlands. All previously wrapped trees assessed showed no evidence of beaver chew, despite widespread signs of beaver activity in the surrounding area. This work has directly contributed to the conservation of cottonwood stands that are critical for multiple species and irreplaceable within wetland ecosystems. Furthermore, they are becoming increasingly more at risk due to prolonged drought conditions caused by climate change. By safeguarding existing wildlife trees, and identifying future protection sites, this project has supported long-term biodiversity, habitat connectivity, and ecosystem resilience, within one of British Columbia's most important wetland complexes.

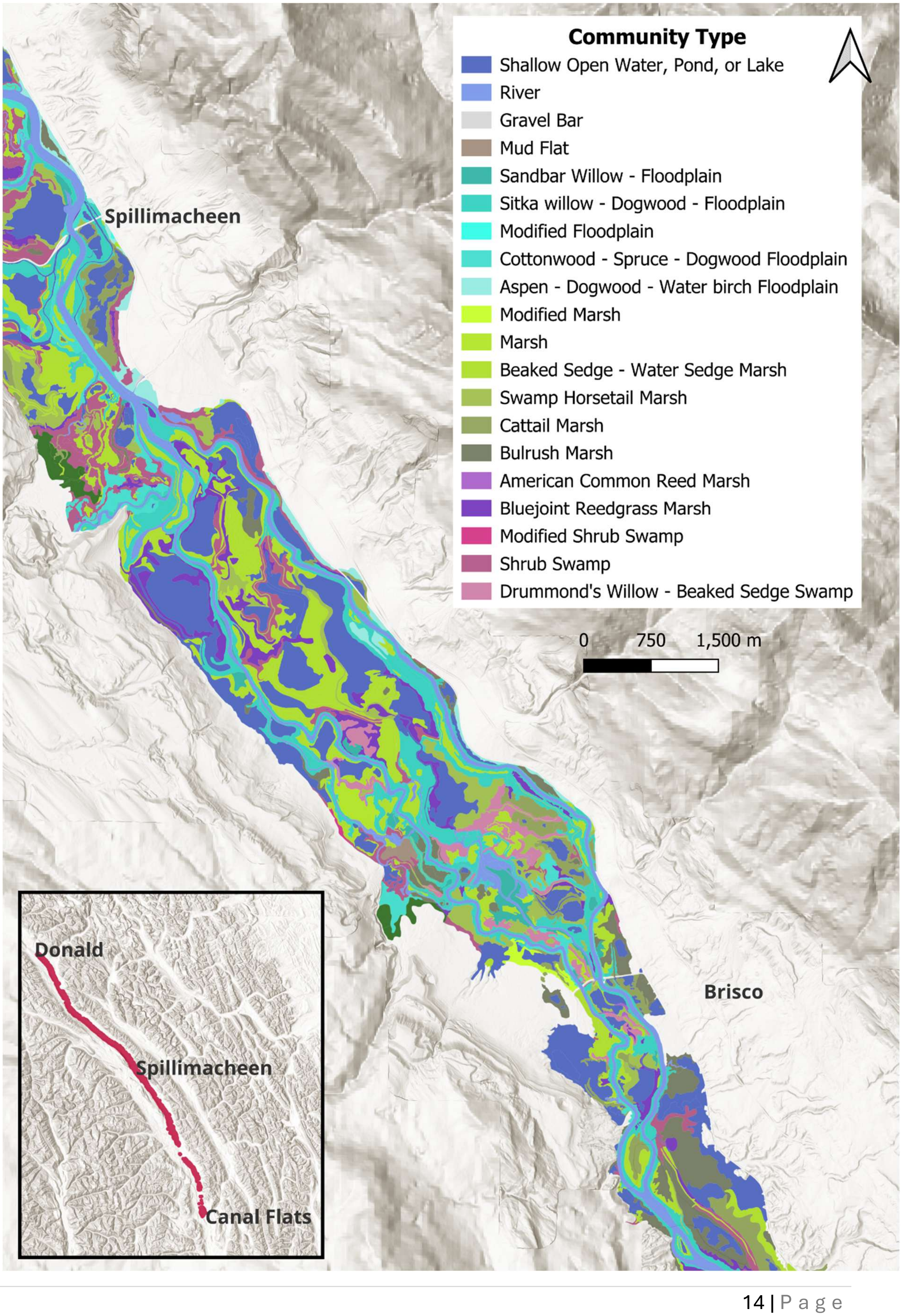
9. 7CW Fairmont Keystone Corridor Project Final Report

The Kootenay Connect Fairmont Keystone Corridor Project focuses on preserving ecological connectivity between the Purcell and Rocky Mountains by targeting a critical wildlife corridor near Columbia Lake. This stewardship initiative targeted one key parcel, which tied into complementary efforts on adjacent properties. The project has achieved its objective to enhance grassland and riparian habitats for native species and has co-benefits to the people in the area. Over the 2 years we have fenced 65 ha of land, assessed the land and grazed sustainably, sprayed 5 ha of noxious weeds, installed and maintained 2450 m of fencing and restored 2.02 ha of ingrown forest by thinning and mechanical mulching. Collaboration with local landowners and the Farmland Advantage program ensures ongoing habitat improvement, connectivity and reduced flood and fire risk throughout the region.

10. 7CW Classification of Columbia Wetlands Vegetation

In 2020, Ryan Durand combined drone flights, in-person assessments, and a variety of geospatial data to map the ecosystem types (ecotypes) of the Columbia Wetlands complex in accordance with the B.C. Wetlands of British Columbia Identification Guide (Mackenzie and Moran, 2004). These works spanned from Canal Flats to Donald and classified 21,000 ha of wetland – a sample of this data is provided below (Figure 1). Of the 39 ecotypes reported, the most common by area was Beaked sedge – Water sedge Marsh (Wm01) followed by shallow open water (OW). Overall, marsh ecotypes (e.g., Wm01, Wm02, Wm05, Wm06) were the most common type of wetland but floodplain (e.g., Fl04, Fl06, Fm02, Fm07) and swamp (e.g., Ws04, Ws06, Ws07) wetlands also contributed significantly to the area. Some at-risk ecological communities, including cattail marsh (Msdk-, IDFxk-, IDFdk5-Wm05), were observed during these works which highlight the importance of protecting the Columbia River wetlands.

This dataset, among others generated by CWSP, were submitted to the provincial government in 2025 for inclusion in their updated wetlands database. The provincial government included ecotypes classified as marsh, swamp, or shallow water wetlands in their database. This data was published in 2026 and is available through the B.C. Data Catalogue (Consolidated Wetlands – Polygons).


Community Type
Shallow Open Water, Pond, or Lake
River
Gravel Bar
Mud Flat
Sandbar Willow - Floodplain
Sitka willow - Dogwood - Floodplain
Modified Floodplain
Cottonwood - Spruce - Dogwood Floodplain
Aspen - Dogwood - Water birch Floodplain
Modified Marsh
Marsh
Beaked Sedge - Water Sedge Marsh
Swamp Horsetail Marsh
Cattail Marsh
Bulrush Marsh
American Common Reed Marsh
Bluejoint Reedgrass Marsh
Modified Shrub Swamp
Shrub Swamp
Drummond's Willow - Beaked Sedge Swamp
0 750 1,500 m
Spillimacheen
Brisco
Donald
Spillimacheen
Canal Flats