COLUMBIA MOUNTAINS INSTITUTE of Applied Ecology

Forum Summary

CMI Annual Researchers' Forum

October 22 - 23, 2026

Rossland, BC









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The Columbia Mountains Institute of Applied Ecology (CMI) hosts an annual Researchers' Forum where we gather members of the scientific community, Indigenous community, stewardship groups, students, land managers, and interested individuals to provide updates on ecological projects taking place in southeastern British Columbia – everything from field trials, new restoration projects and their associated community initiatives, to ecosystem monitoring and research. These updates cover a wide range of topics and species in an informal atmosphere - everyone is invited to attend, mix, and mingle! CMI's annual Researchers' Forum's travels the Columbia Basin each year - it serves as a long-standing community-building and networking event for applied ecologists in the region.

This year we gathered at the historic Miners Union Hall in Rossland, BC. We started the day beautifully with a panel conversation between Elliott Tonasket (Okanagan Nation Alliance), Richard Desautel (Sinixt Confederacy), and Chad Luke (Ktunaxa Nation Council), who reflected on what it means to be a knowledge holder, what long-term stewardship means when it is framed in the context of all living things, and a "one heart" approach to caring for the land. The event agenda can be found here.

From there we turned to restoration in dry ecosystems. Four brave Selkirk College students shared what reclaiming a dry site at the Trail Airport taught them, and we heard about the successes of bringing fire back onto the land along the Lower Arrow Lakes. We learned how research on showy milkweed is guiding pollinator habitat connectivity in the lower Columbia Basin, saw an innovative use of the native fungus *Hypholoma* to heal soils affected by *Armillaria* root disease, and heard how purpose-built structures are making space for nesting Barn Swallows in the Creston Valley. During the breaks, posters and displays featured exciting restoration work on Dove Hill, habitat enhancement for bats and for sina (beaver) on Golden's West Bench, the Syilx chronic wasting disease program, invasive species, the Rossland Streamkeepers, and the Rossland Forest Park project.

In the afternoon we were sobered by shifting ecosystems - shifting forest species and shifting hydrology across the Kootenays, but we also heard how we can promote resilience in landscapes and in our local forest parks. We were heartened by videos of salmon and their fry in our own backyard and by hearing about the salmon warriors working to bring them home. The day closed with a proof-of-concept framework for collaboration between Western science and Indigenous Peoples, and thoughts on Indigenous data sovereignty. That evening, Jakob Dulisse shared the secret lives of snakes and other unsung creatures of the lower Columbia, and the following day we explored research and restoration projects near the Waneta Dam and Pend d'Oreille on a multi-stop field tour.

A common thread throughout the forum was collective learning – learning that has occurred by sitting back, watching and listening, and learning from the land, and all living things. With the type of leadership sharing space at this event, leadership rooted in humility and in learning, we have all the tools needed to plant Elliott's symbolic apple seed and water it with one heart.

A big **thank you** to everyone who took the time to share their work with us, bring their colleagues and students to the event, and for the important work you do. Thank you to the following CMI directors who volunteered at this event: Marc-Andre Beaucher, Marcy Mahr, Isobel Phoebus, Catherine Craig, Kevin Bollefer, Mike Miller, and Randy Moody. A big thanks also to Alyson Brda for volunteering and everyone else who contributed in innumerable ways, large and small. Without these volunteers, this event would not have run so smoothly and without your keen attendance the event would not be so special. Thank you also to CMI's Executive Director Hailey Ross for the organization and delivery of yet another well-organized Researchers' Forum.

Event Sponsors

Many thanks to FortisBC, Teck Trail Operations, Columbia Power Corporation, Red Mountain and Kalesnikoff for your financial support.



The 2026 Researchers' Forum at the Rossland Miners Union Hall.

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ORAL PRESENTATIONS (in order they were presented)

1. Panel: What does ecosystem restoration mean to you and your community? (Desautel, Tonasket and Luke)

Presenters: Elliott Tonasket, Syilx knowledge holder, Okanagan Nation Alliance; Richard Desautel, Sn̓ʕay̓ckstx knowledge holder, Sinixt Confederacy; Chad Luke, Ktunaxa knowledge holder, Ktunaxa Nation Council

The Researchers' Forum began with story-telling and a discussion with a panel of First Nation knowledge holders. Marcy Mahr hosted the discussion, sharing that people in the room were professional ecologists involved in ecosystem restoration and land stewardship. The knowledge keepers were asked if they would share what ecosystem restoration meant to them and their communities, as the original care-takers of the land. Looking to the future, they were asked what opportunities they saw to work more with ecosystem scientists as allies in their territory.



Elliott Tonasket, Okanagan Nation Alliance, speaking during the panel.

Elliott Tonasket is a Syilx knowledge holder, and Cultural Facilitator for the Okanagan Nation Alliance Natural Resources Department. In his role as Cultural Facilitator, he is engaged in various multi-nation discussions related to the Columbia River Salmon Restoration Initiative, Cultural Stewardship Plan for the Columbia Reservoir system, and an ongoing apprentice to the Calling the Salmon Home ceremonies, Cultural Salmon Fry releases and various relationship building initiatives between people, organizations and various levels of governments that focuses on how we can best support the place which we call home.

Elliott, with drum in hand, helped us to get started in a good way with song. Holding an apple, he had us spoke metaphorically about how the flesh of one apple doesn't go very far towards feeding people, but that proper care of the seeds held within will produce roots to hold soil, a canopy that provides shade, a home for birds and many other creatures, and apples to nourish many.



Rick Deseautel, Sinixt Confederacy, speaking during the panel.

Rick Desautel is a Sinixt elder and hunter who for 25 years worked for the Colville Confederated Tribes Fish and Wildlife Division. In his career he's worked on a variety of fish and wildlife issues and education. Currently Rick is the Sinixt Outreach Technician for the Sinixt Confederacy in which he continues to educate people in the traditional territory and help reconnect his people south of the border with their territory in Canada. Rick is likely known to many in our area as the ceremonial hunter that turned himself in after shooting an elk in his traditional territory.

Rick spoke about the wisdom and resilience of nature when left to do its work. He also spoke about how time on the land, and in many different capacities in the Confederated Tribes Fish and Wildlife Division have taught him a great deal. An invitation to share this knowledge with anyone willing to take the time to learn was put forth.



Chad Luke, Ktunaxa Nation Council, speaking during the panel.

Chad Luke lives within ?amakis Ktunaxa, specifically the area known as Yaqan Nukiy, and the suburb called Creston. He had the privilege to live and grow up with is Great uncle Dawit' who taught him, and his brothers and sisters, many Ktunaxa customs, cultural ways, and traditions. His uncle helped him to understand where he was from and how he and the Ktunaxa are

connected to the land. Now, Chad shares that knowledge with those who would like to learn. Chad considers himself a person who shares Ktunaxa values and is thankful for what he has been taught.

Chad expressed his gratitude to his teachers, including his Great uncle Dawit' for their teachings. He spoke about how it was unsafe to share these teachings for a long time, but noted that things are changing. As it becomes safer for Ktunaxa teachings to be shared, he had hope for the ways in which this wisdom will work to heal the land and care for all living things. Chad also spoke about a one-heart path, and the value of working together.

2. Lessons learned in reclaiming a dry ecosystem at the Trail Airport (Cashin, Machado, Spoerri & Drake)

Presenters: Will Cashin, Solange Machado, and Katja Spoerri, Applied Environmental Science and Planning Technology, Selkirk College

Summary prepared by Meghan Drake, Applied Environmental Science and Planning Technology, Selkirk College. Meghan lead the field tour to Trail Airport site the following day.

In April of 2026, a group of students from Selkirk College planted 8 x 50m2 plots, the first year of a 5-year restoration project to restore functionality to a degraded site within the very dry, warm Interior Cedar Hemlock BEC zone (Hausleitner, 2026). The site D3/D4 is due west of the Trail Airport on Highway 22A and was previously used as a staging area during the Waneta dam expansion, resulting in compressed soils, poor diversity of vegetation and loss of functionality (Biebighauser, 2019). The restoration goal was to increase habitat connectivity with the existing vegetation to the south and west of existing diversion channels, creating a functional corridor for animal movement to water (Hausleitner 2026).

To prepare the plots, an excavator loosened the topsoil and piled coarse woody debris on the southwest perimeter of 8 plots to act as shade for vegetation and thermal regulation for reptile habitat. Restoration techniques such as cold air refugia (n=3) and introducing local mycorrhizae fungi (n=2) were utilized as well as leaving some control plots (n=3) (Figure 1).

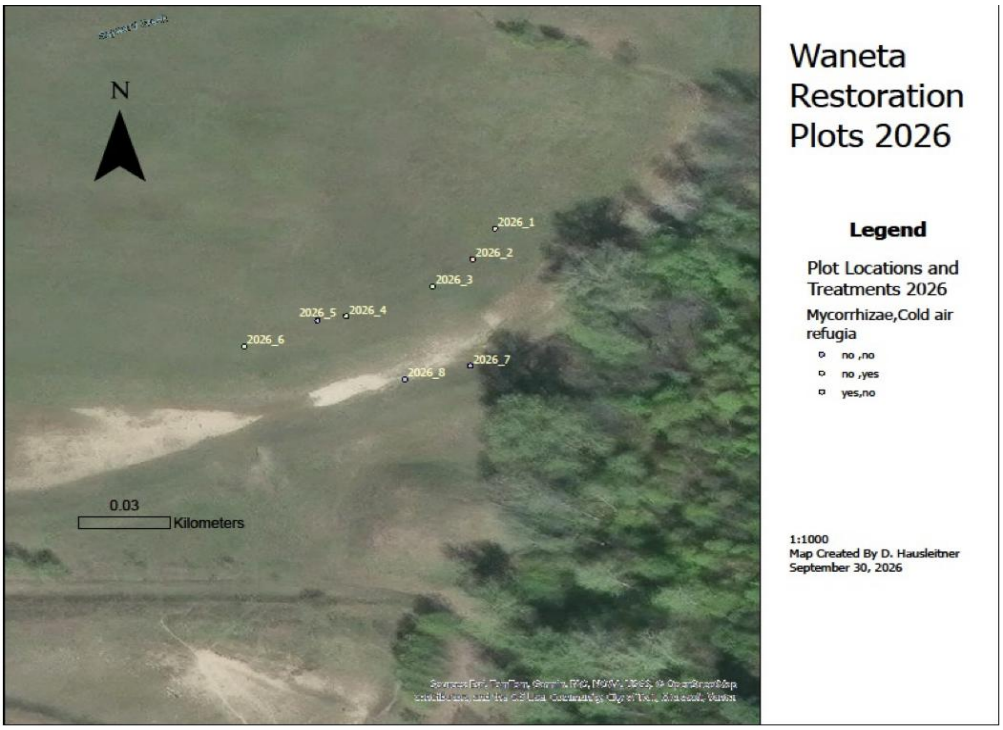

Figure 1 Waneta Restoration Site Map with plot layout and treatments

Clusters of mallow ninebark

(*Physocarpus malvaceus*), nootka rose (*Rosa nutkana*), wood's rose (*Rosa woodsi*), Oregon grape (*Mahonia aquifolium*), and chokecherry (*Prunus virginiana*) were planted to support our objective of increasing low shrub cover by 60% in our plots within 3 years of planting to enhance nesting habitat. Other species were also planted to increase diversity and reduce populations of invasive species within the plot boundaries to 20% cover of plot area within 2 years of planting (Table 1). The plots were watered minimally over summer by volunteers when rain was most scarce. In September, 2026, 11 pollinator species were provided by the Kootenay Native Plant Society and dispersed across the plots.

Table 2. Summary of treatments (cold air refugia and/or mycorrhizae) and shrub species planted by plot, at Waneta D3/D4 site April 2026 and survival in parenthesis monitored in September 2026.

Plant Species		**Plots**								**Total**	**Success (%)**
		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**		
Mycorrhizae		Yes	Yes	No	No	No	No	No	No		
Cold Air refugia		No	No	Yes	Yes	No	Yes	No	No		
Common Name	**Latin Name**										
Mountain alder	*Alnus incana*	2(2)	2(2)	2(2)	3(1)	2(2)	3(3)	3(2)	1(1)	18(15)	83
Paper birch	*Betula papyrifera*	2(2)	3(2)	3(4)	3(3)	4(4)	2(2)	4(1)		21(18)	86
Black hawthorn	*Crataegus douglasii*	2(1)	5(1)	3(3)	5(4)	5(3)	3(3)	3(1)	2(2)	28(18)	64
Wolf willow	*Eleagnus commutata*	2(0)	2(1)	2(2)		2(2)	2(2)	3(0)	1(1)	14(8)	57
Rocky mountain juniper	*Juniperus scopularum*	3(3)	2(2)	3(3)	3(3)	4(4)	3(3)	3(2)	3(3)	24(23)	95
Oregon-grape	*Mahonia aquifolium*	2(2)	5(0)	5(3)	4(1)	7(2)	5(4)	5(2)	5(0)	38(14)	37

Mock-orange	*Philadelphus lewisii*	4(2)	3(1)	4(4)	6(6)	4(4)	4(4)	3(0)	4(4)	32(25)	78
Common Name	**Latin Name**										
Mallow ninebark	*Physocarpus malvaceus*	10(7)	12(7)				10(8)			32(22)	69
Trembling aspen	*Populus tremuloides*	2(0)	2(0)	2(1)	2(2)	1(1)	2(0)	2(0)	2(1)	15(5)	33
Chokecherry	*Prunus virginiana*	8(2)	4(4)	1(2)	1(1)	3(3)	4(3)	3(3)	6(5)	30(23)	77
Smooth sumac	*Rhus glabra*	1(1)	2(2)	4(3)	2(2)	2(2)	2(2)	1(0)	2(2)	16(14)	88
Nootka rose	*Rosa nutkana*	4(4)	3(2)	1(2)	2(2)	4(4)	4(4)	4(3)		22(21)	95
Wood's rose	*Rosa woodsii*	2(2)	4(2)	2(2)	3(2)		3(2)	3(0)	3(1)	20(11)	55
Blue elderberry	*Sambucus nigra*	4(2)	1(0)	3(3)	4(1)	2(2)	3(3)	3(0)	3(2)	23(13)	57
Snowberry	*Symphoricarpos albus*	2(1)	4(3)	4(4)	4(4)	1(1)	2(2)	3(3)	3(3)	23(21)	91
Black cottonwood	*Populus trichocarpa*	1(1)	1(2)	3(2)	2(2)	2(1)	1(1)	3(2)	3(2)	16(13)	81
Totals		51(32)	54(30)	42(40)	44(34)	43(25)	52(46)	43(19)	38(27)	367(253)	68.9
Success (%)		62.7	55.6	95.2	77.3	81.3	88.5	44.2	71.1		

The plots were assessed in September 2026, and it was found that the cold air refugia had had the highest survival rate with an average of 87% success (Table 1). Success was the highest in plots where students had planted in microhabitats called cold air refugia. While survival rates were high, it was evident that drought and browse was having significant impact on all the planted species. Recommendations include fencing the 2026 plots as well as all future plots. Also, we recommend adding coarse woody debris so that it accounts for at least 20% ground cover in all plots as well as mulching all plots to help retain ground moisture and prevent invasive plant infill.

This project is relatively new and will be continued by the next five cohorts of students adding 8 x 50m2 plots per year for the next 5 years working west down the drainage ditch with the goal of increasing habitat connectivity and functionality.

References

Biebighauser, T. 2019. Field Management Plan Waneta Expansion Power Corporation Land. Report Prepared for Columbia Basin Trust and Columbia Power Corporation. 23pp.

Hausleitner, D. 2026. Restoration Prescription for Waneta D3/D4. Report prepared for Columbia Basin Trust and Columbia Power Corporation.

Acknowledgements

We wish to acknowledge the contributions and thoughtful creative solutions of Selkirk College’s AESP class of 2027. They tackled this project with gusto and panache. We also extend our sincere thanks to Michael Hounjet and Columbia Power Corporation for providing the resources needed to make this restoration project possible, including soil preparation and plant materials, and for supporting an adaptive management approach that encouraged creativity and experimentation. We are grateful to the Kootenay Native Plant Society for supplying additional plant materials that helped diversify our restoration plots and incorporate a pollinator-focused perspective into the project.

Finally, we acknowledge and thank the land itself for its many lessons. Through this work, the landscape has been both teacher and guide, offering insights into restoration, resilience, and our responsibility as stewards of these ecosystems.

3. Lower Arrow NDT 4 ecosystem restoration project, WLRS-FWCP (Hill and Gagnon)

Presenters: Thomas Hill, Thomas Hill Environmental tjhill18@hotmail.com; Chanel Gagnon, Ministry of Water, Lands and Resource Stewardship chanel.gagnon@gov.bc.ca

The Lower Arrow Ecosystem Restoration Project, initiated in 2013, aims to restore fire-maintained Natural Disturbance Type 4 (NDT4) ecosystems along the Lower Arrow Lakes Reservoir. Building on prescribed burning initiatives dating back to the 1980s, the project addresses forest ingrowth and the loss of open forest structure associated with fire exclusion in the very dry, warm Interior Cedar–Hemlock (ICHxw) biogeoclimatic subzone.

The primary objectives are to reintroduce low-intensity, low-severity fire, restore open forest mosaics, improve ungulate winter range habitat, and increase ecosystem resiliency. Restoration planning integrates GIS modelling, aerial reconnaissance, imagery review, ungulate census data, and ground surveys, alongside burn prescription development, cultural heritage assessments, values-at-risk mitigation, and collaboration with First Nations and BC Wildfire Service (BCWS). Treatments include aerial ignition using helicopters, as well as manual slashing and pile burning where more targeted vegetation management is required.

Since 2013, 14 restoration projects have treated approximately 1,065 ha, with five additional treatments planned by 2029, covering a further 830 ha. The 2021 Octopus Creek wildfire affected five restoration projects encompassing approximately 1,060 ha. The broader restoration program originally aimed to treat approximately 3,000 ha between Syringa Provincial Park and Octopus Creek.

Long-term monitoring evaluates treatment effectiveness through measures of tree survival and regeneration, plant diversity, species abundance, invasive species, vegetation cover, tree density, coarse woody debris, and fuel characteristics. Results from the Grey Wolf South restoration unit demonstrate substantial fire-caused mortality among regeneration, saplings, and pole-sized trees, alongside increased red-stemmed ceanothus cover at plots over ten years.

These findings illustrate the potential for prescribed fire to modify stand structure, promote understory vegetation, reduce fuel continuity, and restore fire-maintained ecosystems. By restoring open forest structure and reducing hazardous fuel continuity, ecosystem restoration treatments may also help moderate the effects of future stand-initiating wildfires while maintaining high-value wildlife habitat.

Resources

- BC Data Catalogue Ecosystem Enhancement layer: Habitat Enhancement - Burning and Slashing Activity - FWCP - Columbia Basin

Biographical notes

Thomas Hill has worked as a wildlife technician on a variety of wildlife and ecosystem restoration related projects around the west Kootenay and other locations in BC for over 20 years. He helped develop the Lower Arrow NDT 4 ecosystem restoration project from its conception.

Chanel Gagnon was born and raised in British Columbia and has lived and worked in the Kootenays since 2018. She is the West Kootenay Wildlife Biologist with the Fish and Wildlife Compensation Section of the Ministry of Water, Lands and Resource Stewardship. With nearly 10 years of experience working in terrestrial ecosystems throughout the Kootenays, Chanel focuses on the FWCP's West Kootenay Enhancement and Land Management Operations, supporting ecosystem restoration and the management of conservation lands throughout the West Kootenays.



Thomas Hill, Chanel Gagnon, and Irene Manley speak during the field tour.

4. From wild milkweed to connected landscapes: Research guiding pollinator habitat conservation in the lower Columbia Basin (Emmott *et al.*)

Presenter: Ang Emmott, Kootenay Native Plant Society, Nelson, BC
a.emmott@kootenaynativeplants.ca; https://www.kootenaynativeplants.ca

Co-authors: Valerie Huff and Brenda Beckwith, KinSeed Ecologies



Ang Emmott presenting From Wild Mikweed to Connected Landscapes.

Restoring native plant populations requires more than getting plants in the ground, it also means restoring the ecological connections that allow pollen and seed to move between populations.

Research on showy milkweed (*Asclepias speciosa*) in the Lower Columbia basin illustrates how habitat fragmentation can limit plant reproduction and how strategically placed restoration sites can improve connectivity across a landscape.

Showy milkweed, the province's only native milkweed species, occurs in the West Kootenay in scattered populations along the dry valley bottoms. It is the sole host plant for monarch butterflies and provides essential nectar and pollen for other native pollinators. Milkweed reproduction is especially sensitive to isolation. Its specialized pollination system relies on large insects, such as bumble bees and swallowtail butterflies, to transfer pollen between genetically distinct plants.

The talk explored how long-term monitoring of wild milkweed populations, ecological research and landscape mapping can guide conservation planning. Restoration work has aimed to increase connectivity between existing populations by enhancing patches and establishing new ones in strategic locations. By 2025 (Figure 1), 13 populations were reported to be reproducing, compared with two known reproducing populations prior to restoration efforts. (Figure 2). The mean nearest-neighbour distance between populations decreased from 10.4 to 4.2 kilometres, indicating reduced isolation and improved potential for pollinator and plant movement. These results highlight the value of considering habitat arrangement, not simply the number of plants, in restoration planning.

The broader message is that milkweed conservation can help guide wider pollinator and biodiversity conservation. Small habitat patches in parks, school grounds, road rights-of-way and private gardens may help close connectivity gaps when they are strategically placed. Long-term stewardship, monitoring, use of locally adapted seed and community participation will be important to sustain these gains and support climate-resilient habitat for native plants and pollinators across the Lower Columbia basin.

Biographical notes

Ang received their BSc in Environmental Biology from Queen's University in 2020, and is currently completing the Restoration of Natural Systems certificate program through University of Victoria and the Master Melittology program via Oregon State University. Ang is also the Stewardship Coordinator with the Kootenay Native Plant Society, where they work at the intersection of ecological research, habitat restoration, and community stewardship. Their work focuses on translating long-term research into community-based conservation initiatives that support native plants, pollinators, and ecosystems across the West Kootenay.

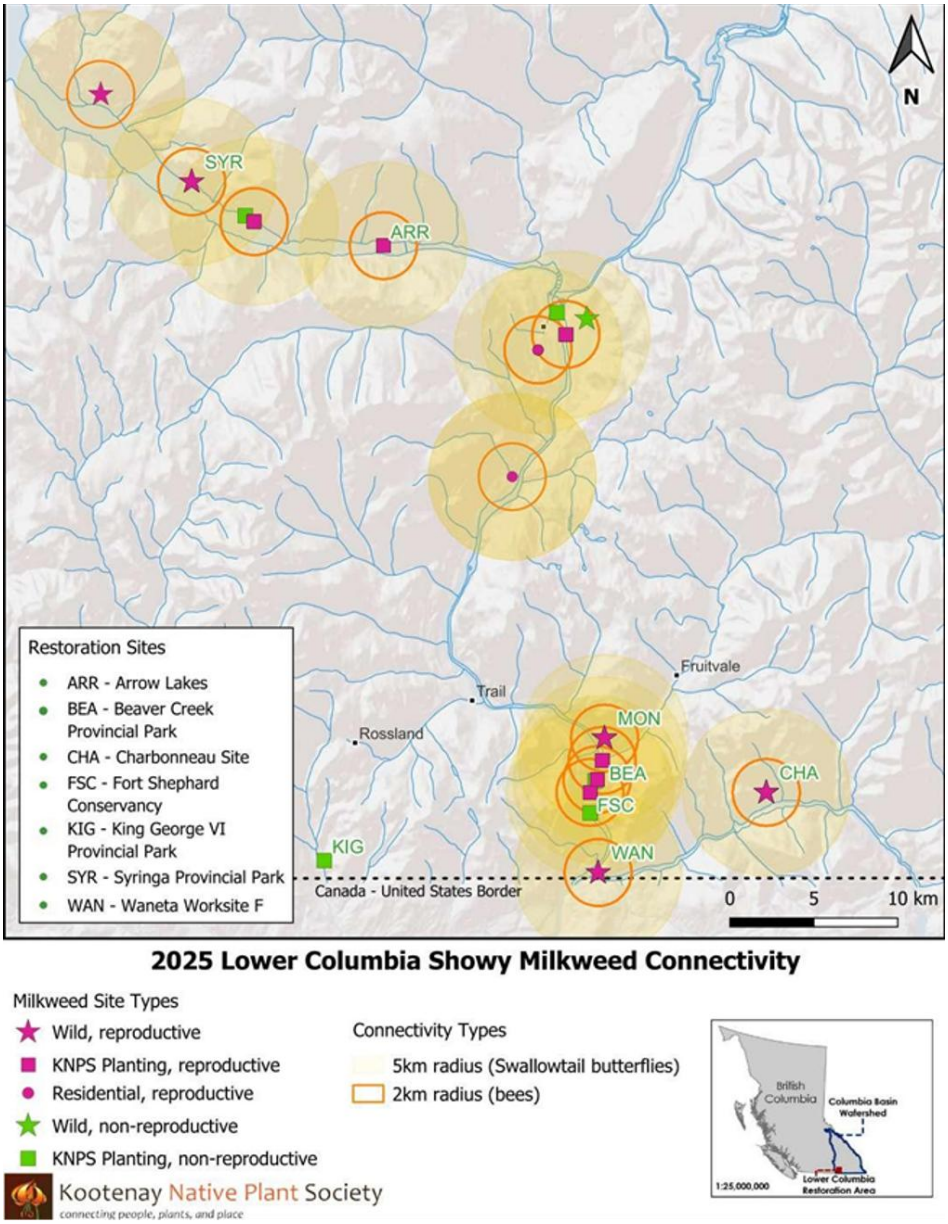

Figure 1. 2025 Showy milkweed sites in the lower Columbia basin, post-restoration work.

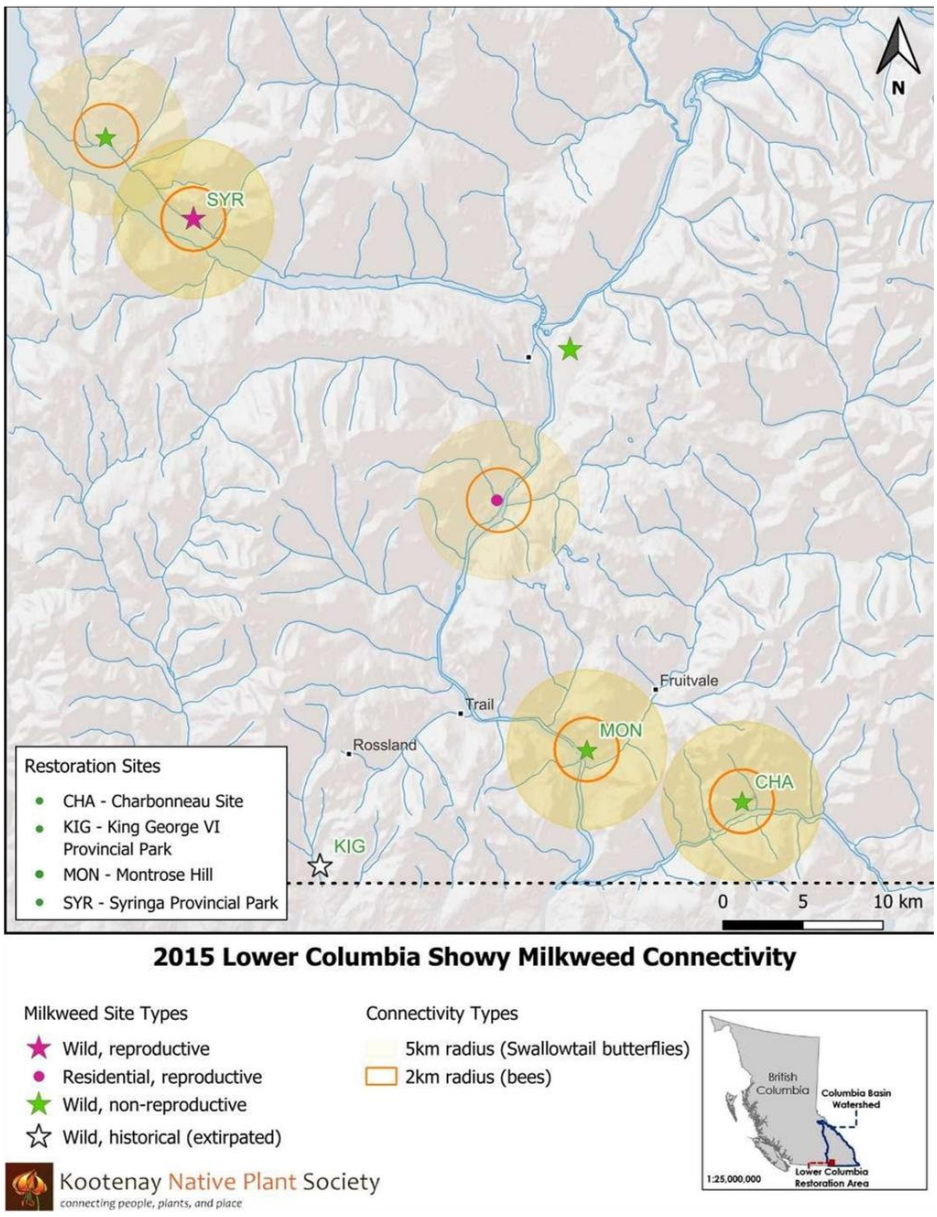

Figure 2. 2015 Showy milkweed sites in the lower Columbia basin, pre-restoration work.

5. Biocontrol trials to reduce *Armillaria* root disease in managed forests using a native fungus (*Hypholoma*) (Leslie)

Presenter: Adrian Leslie, MSc, RPBio, White Bark Consulting, Nelson, BC

Co-author: Michael P. Murray, Ph.D., P.Ag., Forest Pathologist, Kootenay-Boundary Region, Ministry of Forests, Nelson, BC



Adrian Leslie presenting on Hypholoma and Armillaria.

Armillaria root disease is a native fungus that causes more tree mortality than beetles and fire combined in BC's Southern Interior Forests. *Hypholoma* is a native saprophytic fungus that can effectively out compete and reduce *Armillaria* in dead stumps and roots. Following logging or fuel treatments, the underground mycological balance is disrupted, and *Armillaria* takes over the now dead root systems, then infecting mature trees and young saplings alike. The threat of *Armillaria* infecting mature trees is legitimately cited as a reason not to do partial cutting in some forest types in the Kootenays. Instead, clearcutting is seen as the only option in stands that have *Armillaria* present, sometimes followed by mechanical stump removal ("stumping") to reduce *Armillaria* in the regenerating stand. While effective at reducing *Armillaria*, stumping and clearcutting also have many long-term negative consequences to forest productivity and ecosystem function. Recent research suggests *Hypholoma* is at least as effective as stumping in reducing *Armillaria* in regenerating stands. The question we are trying to answer with this research is: Can we improve

survival of both mature trees and planted seedlings in partial cuts (e.g. shaded fuel breaks, WUI cuts, seed tree systems, etc.) by producing and deploying *Hypholoma* in a cost-effective manner? We are working with local forest licensees and reviving old mycological growing techniques to grow and plant blocks of sawdust inoculated with *Hypholoma* next to freshly cut stumps in partial cuts over the next 2 years. The intent of this research is to pilot a viable, low-tech method to improve the health of regenerating forests without all the negative ecological impacts of clearcutting and stumping.

Acknowledgements

Funding for this project came from the Silviculture Innovation Program Home - Silviculture Innovation Program who support projects that focus on implementation of innovative silviculture projects and operational research. Project partners include Kalesnikoff, Harrop Proctor Community Cooperative, Selkirk College, and Mr. Mercy's Mushrooms. This work is built upon the research initiated by Bill Chapman in the 1990's after noticing there were few *Armillaria* mushrooms around where there was lots of *Hypholoma* mushrooms.

Biographical notes

Adrian Leslie, RPBio. has worked in the Columbia Mountains for 25 years on a wide variety of applied research and restoration projects aimed at improving the way we manage forested ecosystems. Projects include whitebark pine restoration programs, assisted migration trials, wetland restoration, wildlife friendly fuel treatments, and research on post wildfire ecosystem management. He completed his master's degree in *Armillaria* root disease in managed forests in 2011 and has continued to be involved in *Armillaria* research with Michael Murray ever since.

Dr. Michael Murray, PAg is the regional pathologist for the Ministry of Forests in Nelson, BC and has been leading the long-term research trials on *Armillaria* root disease in the southern interior for almost 20 years. Michael and Adrian recently published a paper showing the promise of controlling *Armillaria* root disease in regenerating forests using *Hypholoma* (a native saprophytic fungi) upon which this new research is based.

References

Michael P. Murray, David Huggard, Adrian Leslie. Effects of tree stump treatments for reducing Armillaria root disease within conifer plantations of southeastern British Columbia, Canadian Journal of Forest Research, Volume 56, 2026, Pages 1-12, ISSN 0045-5067, https://doi.org/10.1139/cjfr-2025-0089.



Adrian showing Hypholoma spawn.



Adrian Leslie with a Hypholoma-colonized log.

6. Making space for Barn Swallows: Nesting habitat creation in the Creston Valley (Shewan)

Presenter: Julia Shewan, BSc, RPBio, Creston Valley Wildlife Management Area
conservation@crestonwildlife.ca; crestonwildlife.ca



Julia Shewan presenting Making Space for Barn Swallows.

Barn Swallow are a species at risk in Canada and habitat loss is one of several threats identified for the species. Alternative habitat creation, such as purpose-built structures intended to attract nesting swallows, may help offset for some of these habitat losses. However, for Barn Swallow, there is a lack of cohesive knowledge about the design, implementation, and effectiveness of such habitat creation projects, which puts practitioners at a disadvantage when designing their own projects. This presentation aims to address some of these knowledge gaps by sharing the key results of a Barn Swallow habitat creation project completed at the Creston Valley Wildlife Management Area (CVWMA). We respectfully acknowledge this project took place within the Traditional Territory of the Yaqan Nuʔkiy people.

The project began when the Wildlife Interpretive Centre had reached the end of its operating lifespan and was slated for deconstruction over the winter of 2019/2020. The structure was a key breeding site for Barn Swallows in the Creston Valley, providing nesting habitat for roughly 30 breeding pairs underneath the building. CVWMA staff planned to build an alternative nesting structure to compensate for the impending loss, though few alternative nesting structure designs had been tried at the time (e.g., OMNRF 2016) and monitoring results at these purpose-built structures were mixed, with success at some and not at others (Parent and Meeker 2018; Campomizzi, Lebrun-Southcott, and Richardson 2019).

Despite these knowledge gaps, CVWMA staff moved forward and built a new structure, affectionately known as the Swallow Hotel, in late 2018, a year in advance of the start of deconstruction of the Wildlife Interpretive Centre. The Swallow Hotel was built at a site roughly 650 m east of the Wildlife Interpretive Centre. The structure measures 18 x 24 ft, and while it was a relatively simple design, the interior roof was purposely overbuilt to provide visual screening for nesting birds based on the results of Mercadante and Stanback (2011). A total of 40 prefabricated wooden nest cups were installed throughout the structure prior to the first breeding season. CVWMA staff monitored the Swallow Hotel pre- and post-deconstruction to determine the level of use.

Monitoring results to date show an initially slow start to occupation at the Swallow Hotel followed by steady increases in the level of breeding activity thereafter. At the outset, a single nest cup was used once during the 2019 breeding season. In 2026, the eighth breeding season that the structure has been available, an estimated 23 breeding pairs used the structure[1]. Breeding success at the Swallow Hotel has been relatively high across all years of monitoring. Successful breeding attempts, those where one or more young fledge the nest, ranged from 58 to 100% of all attempts made in a year (Figure 1). Barn Swallows predominantly use the pre-installed wooden nest cups for breeding though natural nest building was first seen in 2022, four years after the structure was built. Nowadays, several natural nests are maintained and used within the structure in any given year.

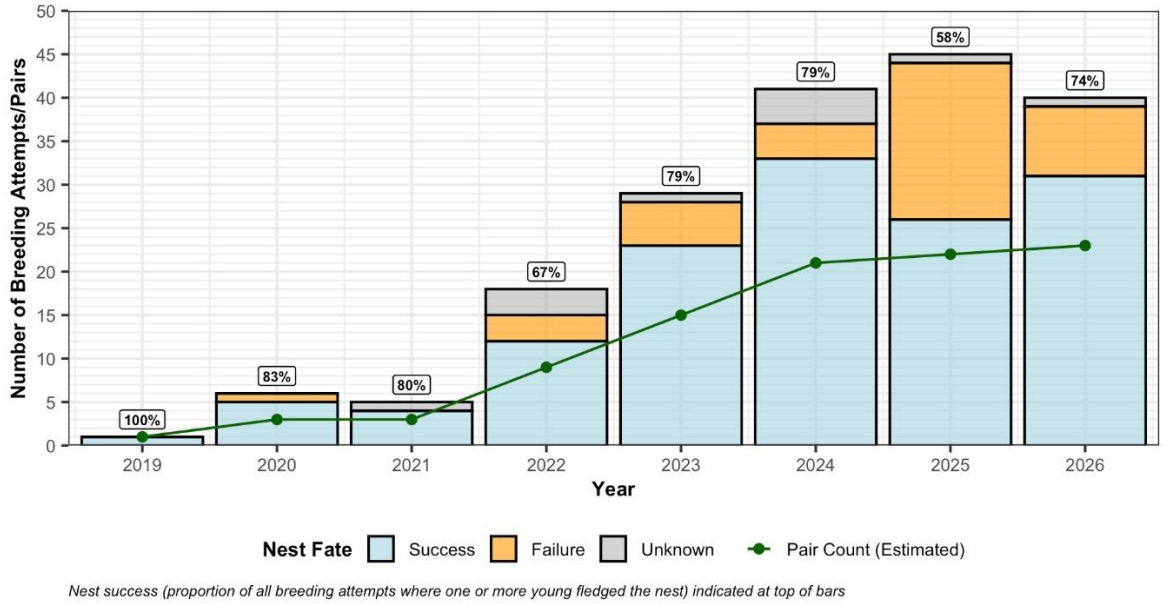

Figure 1. Summary of Breeding Pair Counts and Annual Nest Success Recorded at the Swallow Hotel, 2019-2026.

1 Pair counts are estimates only, not generated through evaluation of banded individuals. Monitoring data indicate that breeding pairs attempt to raise two broods per season, either by reusing a nest for both attempts or switching between nest locations. Some assumptions for breeding pair estimates are that when a nest is used twice in a season, it is the same breeding pair using that nest. When a nest is not reused, the nesting chronology of all other active breeding attempts is reviewed to assign the most probable location for a second attempt of that pair (where applicable).

The encouraging results from the Swallow Hotel led CVWMA staff to build another similar, but larger, alternative nesting structure for Barn Swallows in late 2024. The larger structure, christened the Swallow Resort, measures 24 x 30 ft and had 75 wooden nest cups installed through the structure prior to the first breeding season. CVWMA staff have monitored the Swallow Resort over the past two years and occupation trends at the Swallow Resort are eerily similar to that recorded at the Swallow Hotel. Both structures hosted a single breeding pair in their first year and three the following year. These similarities provide a hopeful outlook for the future occupation of the Swallow Resort. Monitoring is slated to continue for at least ten years for each structure and may be continued further into the future where resources allow.

Some key takeaways from CVWMA's Barn Swallow habitat creation project are summarized below, coupled with some results of habitat projects that have emerged since project inception. Overall, our project has been an overwhelming success. Both our alternative nesting structures have been found by the local breeding population and breeding activity within each continues to increase. However, there are additional factors that influence how a newly built nesting structure is used and to what degree that requires further study. Most practitioners, including ourselves, have found that it takes some time for swallows to find and colonize a new structure, if they use it at all (e.g., Darvill 2026). In contrast, a compensation structure built in southern Ontario hosted similar numbers of birds in its first year relative to the structure it was replacing (based on the number of active nests recorded pre- and post-deconstruction; Ontario Parks 2022). Furthermore, while our designs seem to work well in the Creston Valley, they may not work well everywhere. A replica of the Swallow Hotel was built in the Columbia Valley along with several other similar but smaller structures over the course of 2021 and 2023 (Darvill 2026). To date, only two of the seven structures built have had confirmed use by nesting Barn Swallows and neither of the used structures was the Swallow Hotel replica. As such, nesting habitat creation for Barn Swallow likely isn't a one-size fits all type of situation.

Taken together, the results of our project and other similar projects implemented across the country highlights the ongoing need for collaboration and knowledge sharing among this community of practitioners. There are opportunities to advance the science of alternative habitat creation for Barn Swallow for the benefit of all, to improve the guidance for others considering their own habitat creation projects and to give these projects the best chances for success.

Biographical notes

Julia Shewan is a wildlife biologist with a background in avian ecology. Her work experience, spanning two decades, straddles the cherished grunt work for graduate students, several years in the field of environmental consulting, to her most recent tenure at the Creston Valley Wildlife Management Area (CVWMA) as its Conservation Programs Assistant since the fall of 2018. These varied work experiences have given Julia a breadth of knowledge, from research study design and implementation to environmental impact assessment, and most recently, approaches to wildlife and habitat conservation. While Julia has worked on a number of wildlife species across the decades, none delight her so much as our feathered friends. Her passion for birds truly found a home at the CVWMA, a key breeding area and migration stopover point for hundreds of bird species, including several at-risk species.

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7. A summary of climate change assessments for Kootenay Connect Priority Places (Utzig)

Presenter: Greg Utzig, P.Ag., Conservation Ecologist, Kutenai Nature Investigations Ltd., Nelson, BC g13utzig@telus.net

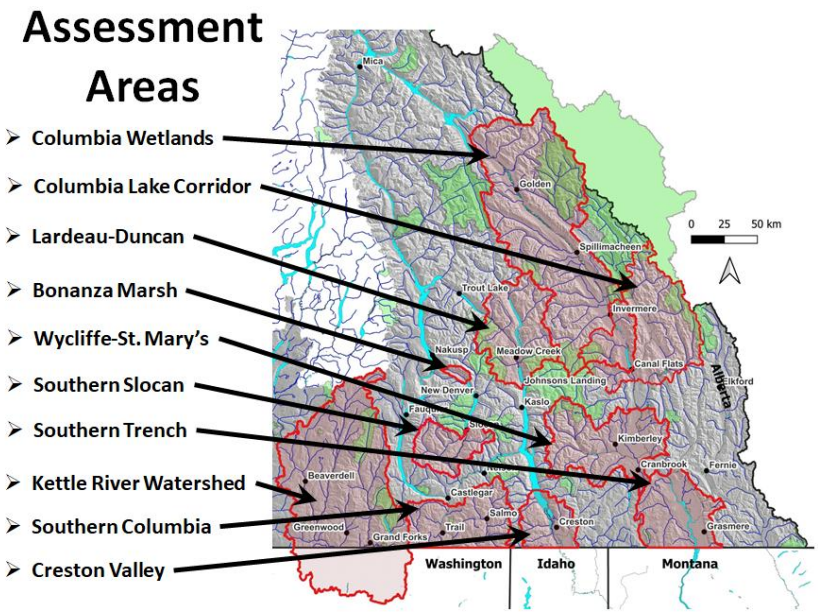


Figure 1. Climate change assessments.

As climate disruption proceeds across the globe, temperatures are rising, hydrologic cycles are being disrupted by droughts and extreme precipitation events, and phenological patterns are being interrupted. Stationarity is dead and uncertainty is now the norm. Most species will have to adapt by: adjusting behavioral patterns, shifting ranges, evolving, or fading to extinction. Over the past few years Kootenay Connect Priority Places has facilitated various projects in seven Kootenay biodiversity corridors to better understand and improve connectivity in those areas. This presentation provides an overview of climate change assessments for each of those areas, and similar assessments for a couple other areas (see Fig. 1).

The various assessments highlighted in the presentation summarized climatic changes, potential impacts, and strategic approaches to adapting to the identified changes. Figures 2 and 3 illustrate examples of the projected changes in seasonal temperature and precipitation. As shown, projected changes are similar throughout the area, with minor variations.

Primary issues varied between areas, but themes that occurred repeatedly included:

- Cryosphere disruptions – reductions in snow cover and associated increasing risk of drought, loss of glaciers and associated late summer/fall streamflow reductions;

- Increased vapour pressure deficits – increased evaporative demand resulting in water defecits and increased risk of fire, decreased tree growth and reduced tree resistance to insects and disease;
- Shifting bioclimates – resulting in necessitating species range shifts and need for North-Soulth and elevational connectivity; and,
- Increase frequency and intensity of extreme events.

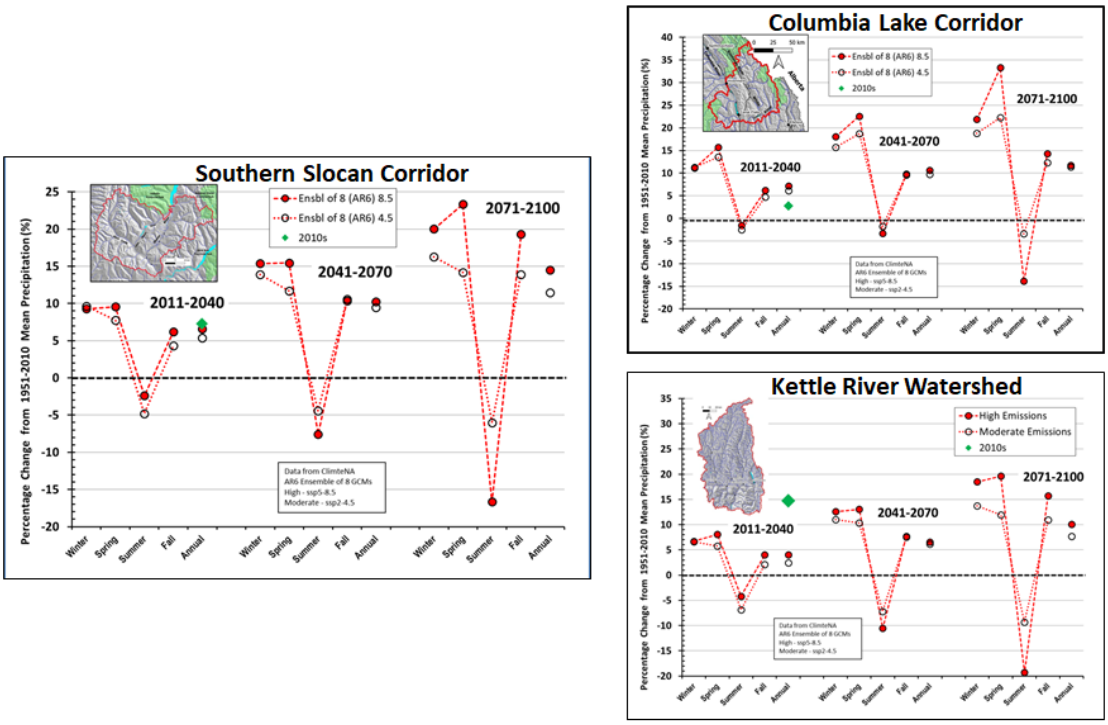


Figure 2. Historic and projected seasonal temperatures (green diamond 2010s).

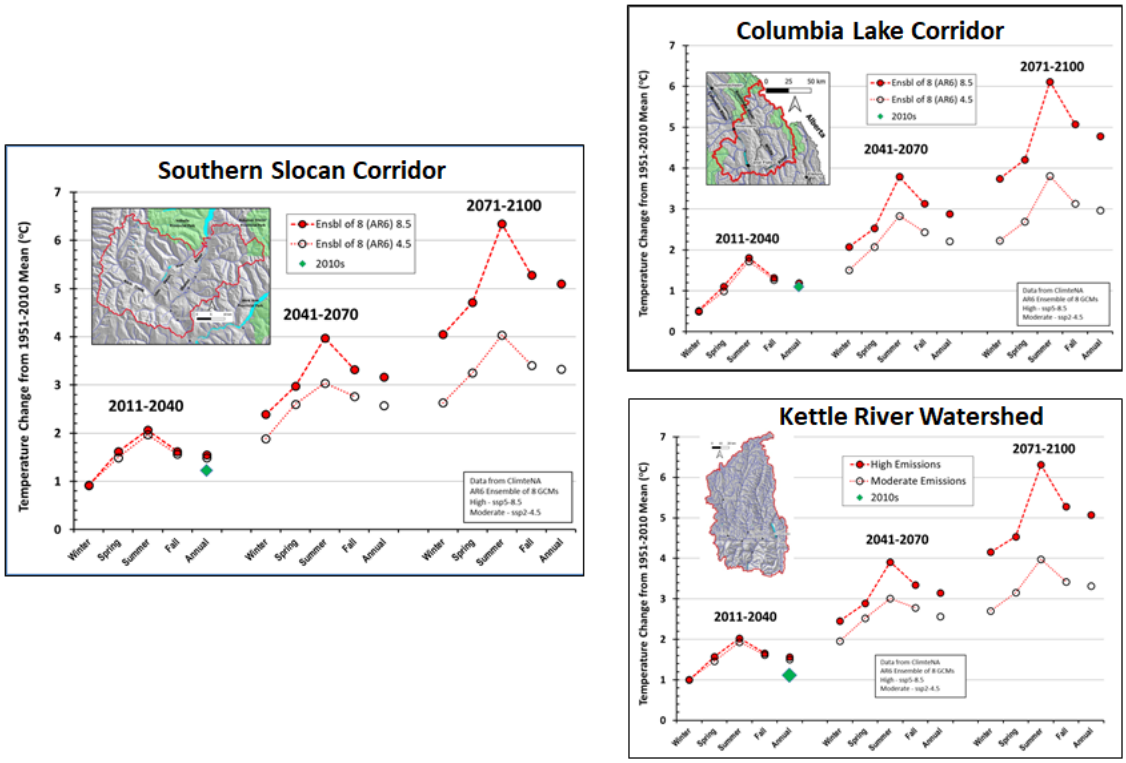


Figure 3. Historic and projected seasonal precipitation (green diamond 2010s).

Examples of the cryosphere impacts are illustrated by loss of seasonal water sources for wetlands in the Bonanza corridor at the north end of the Slocan Valley, glacial retreat in the Lardeau-Duncan corridor, and reductions in late summer/fall water inputs to the Columbia Wetlands in the East Kootenay (Figs. 4-7). Previous studies have shown that in warm dry summers glaciers contribute 25-35% of August and/or September streamflow, and that these flows have been decreasing since at least 2000.

All the reports included a list of strategies for addressing climate change, but also indicated that the only measure which will ultimately reduce the impacts was **elimination of greenhouse gas emissions** – ASAP. Various adaptation strategies for building resilience include:

- Embrace uncertainty,
- Reduce the risk of catastrophic wildfire by re-introducing low intensity fires and thinning stands where appropriate,
- Conserve wetlands, ponds ephemeral streams and seepage areas – assess climate change vulnerability,
- Protect and enhance riparian areas,
- Minimize landslide and debris torrent risk,
- Manage salvage harvesting to reduce impacts,
- Maintain old growth to conserve genetic diversity, and
- Ensure North-South and elevational connectivity for range shifts.

Most of the assessments summarized in this presentation were funded as part of Kootenay Conservation Program initiatives - Kootenay Connect Priority Places and Conservation Action Forums. The Kettle River assessment was prepared for the Kettle River Ripple Effect Forum.

Funding for these projects came from Environment and Climate Change Canada (ECCC), Regional District of Kootenay Boundary, Kootenay Conservation Program and Kutenai Nature Investigations Ltd.

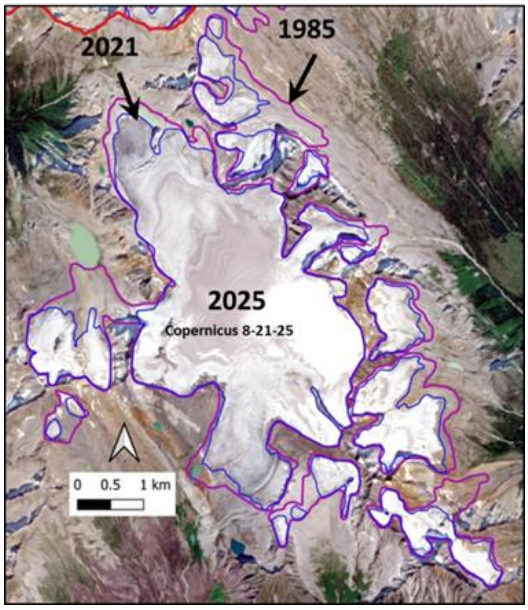


Figure 4. Macbeth icefield changes.

Reports and further information can be found at:

[Kootenay Connect Priority Places - Kootenay Conservation Program]

[Kootenay Connect: Climate Change Science - Kootenay Conservation Program]

[South Selkirks-Lower Columbia - Kootenay Conservation Program]

[South Country - Kootenay Conservation Program]

[Utzig-Climate-Change_Kettle River Valley-RippleEffect_RDKB_5-1-25]

[Kootenay Resilience.org]

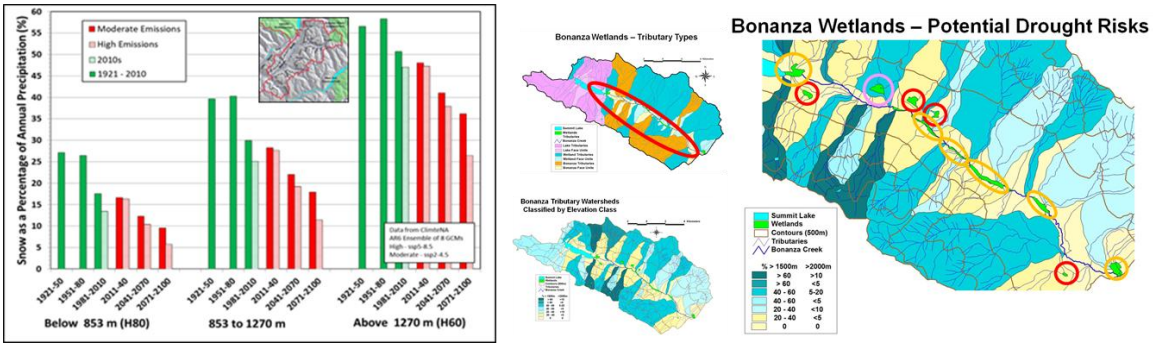


Figure 5. Historic and projected snowfall in Slocan Valley and sensitivity of Bonanza Wetland source watersheds).

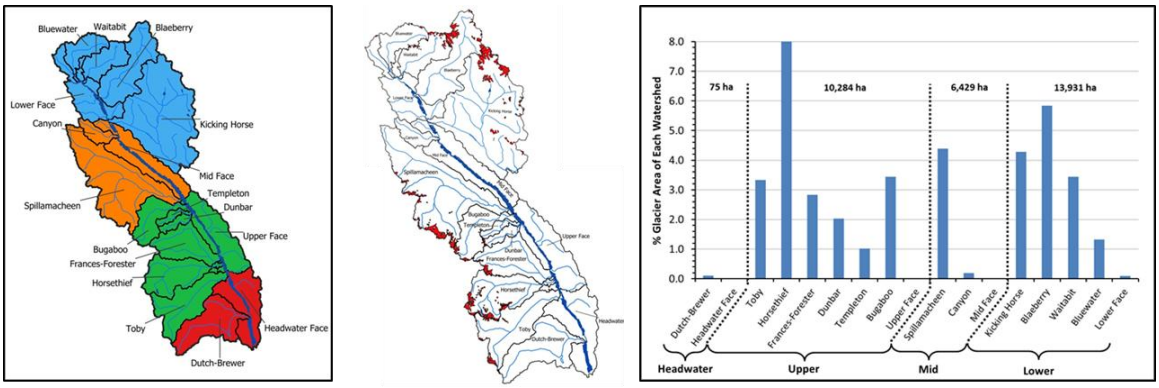


Figure 6. Columbia wetlands source watersheds and glacial water sources.

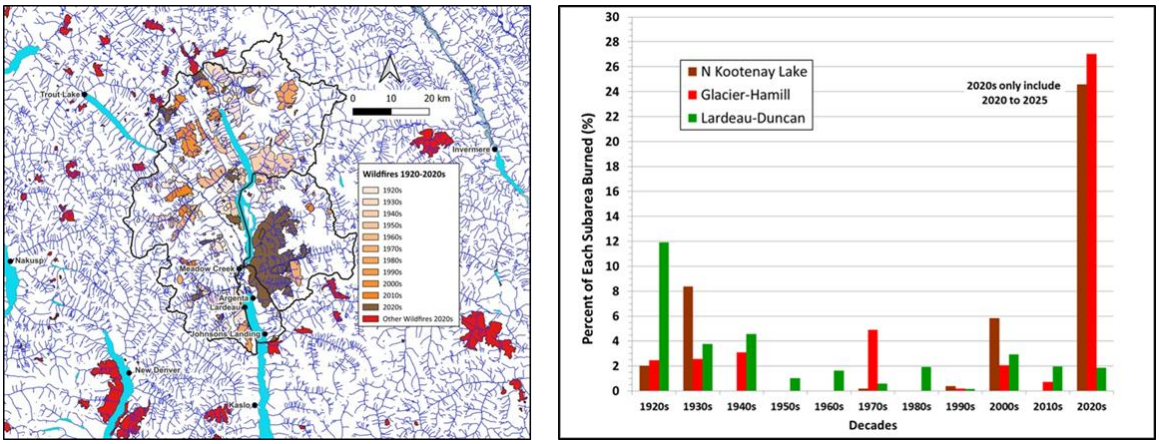


Figure 7. Lardea-Duncan Corridor fire history.

Unfortunately, at this time, governments at both the national and provincial levels in Canada are moving in the wrong direction, and are seemingly determined to make the impacts worse by expanding development of fossil fuel production. This year may set a new record for global temperature (Fig. 8), and the building of a very strong El Niño will ensure next year continues creating further climate disruption across the earth (Fig. 8).

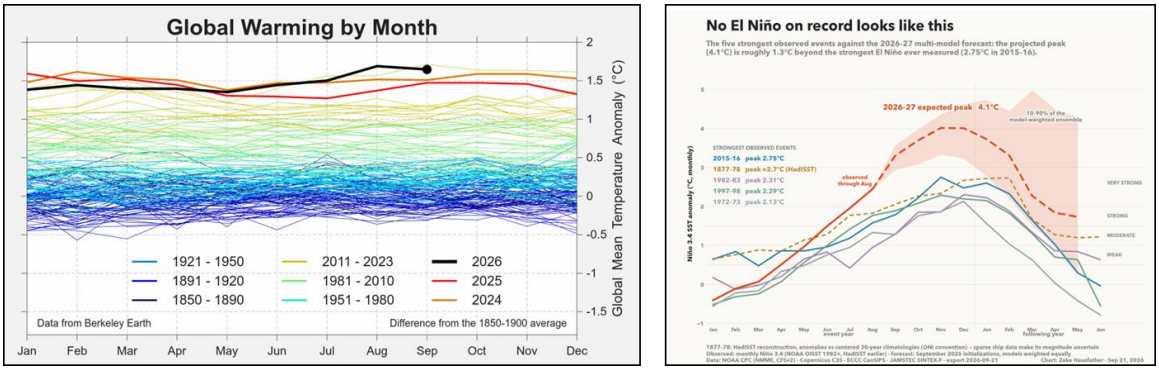


Figure 8. Global monthly temperatures up to September 2026 and development of the 2026/27 El Niño weather pattern.



Greg Utzig presenting on glacial retreat.

8. Climate change informed species selection: Optimising forest resilience (Daust)

Presenter: Kiri Daust, Future Forest Ecosystems Centre, BC Ministry of Forests

Kiri Daust
Future Forest Ecosystems Centre, BC Ministry of Forests
kiri.daust@gov.bc.ca

Climate change is altering the environmental conditions experienced by forests across British Columbia, requiring corresponding changes in reforestation practices. Tree species are adapted to particular climatic conditions; as those conditions shift, species that have historically thrived at a site may become less well suited, while species associated with warmer climates or lower elevations may become more suitable.

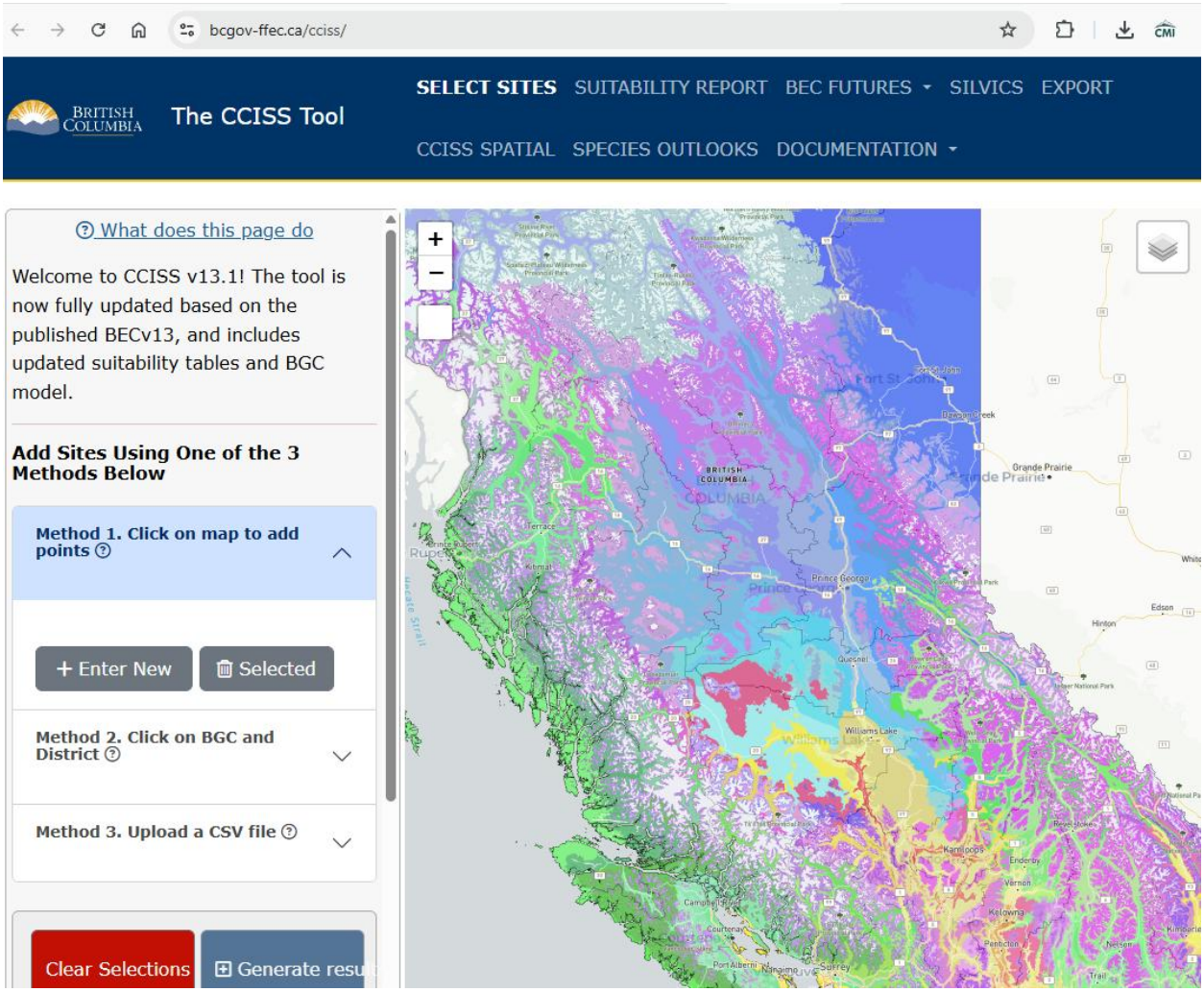
Our team developed the Climate Change Informed Species Selection (CCISS) tool to support climate-informed reforestation and assisted migration decisions. CCISS uses an ensemble of climate models to project changes in biogeoclimatic ecosystem units, then combines these projections with site-type information to estimate changes in tree species suitability. Overall, CCISS projections specific to the Columbia Mountains region show an increase in suitable area for Douglas-fir, Grand fir, and Ponderosa pine, with substantial decreases for cedar, Western hemlock, and Interior spruce. However, the projections separate into two distinct spatial patterns: loss of suitability for almost all timber species in the Southern Columbia Basin where climates are projected to be more suitable for grassland-type ecosystems, but stable or increasing suitability at higher elevations. These patterns suggest it may be important to consider differing management strategies in the two distinct regions.

Climate change is also expected to alter the biotic and abiotic stresses experienced by forests. Increasing tree-species diversity may improve resilience by reducing reliance on a small number of species with similar vulnerabilities. To help practitioners evaluate diversified planting strategies, we developed a complementary analysis based on Markowitz's modern portfolio theory, originally from finance. Applied to tree species, the approach combines climate projections, CCISS suitability projections, and growth data to identify species mixtures that balance expected growth against projected risk factors. A preliminary portfolio for the Rossland region suggests than an optimal mix may include Douglas-fir, Western Larch, Ponderosa pine, and a small percentage of White pine.

The CCISS tool can be accessed here (and please check out the documentation page for lots of extra information): https://bcgov-ffec.ca/cciss/

Biological notes

Kiri is a Data Scientist with the Future Forest Ecosystems Centre, in the Ministry of Forests, where his work focuses on climate modelling and creating decision support tools to make climate and forestry research more accessible. He recently completed his MSc at UVic, developing deep-learning models for increasing the resolution of climate data. Kiri has been involved in the CCISS project since its inception, and has worked closely with Will MacKenzie, Colin Mahony, and Courtney Collins on CCISS-related research since joining the ministry three years ago.



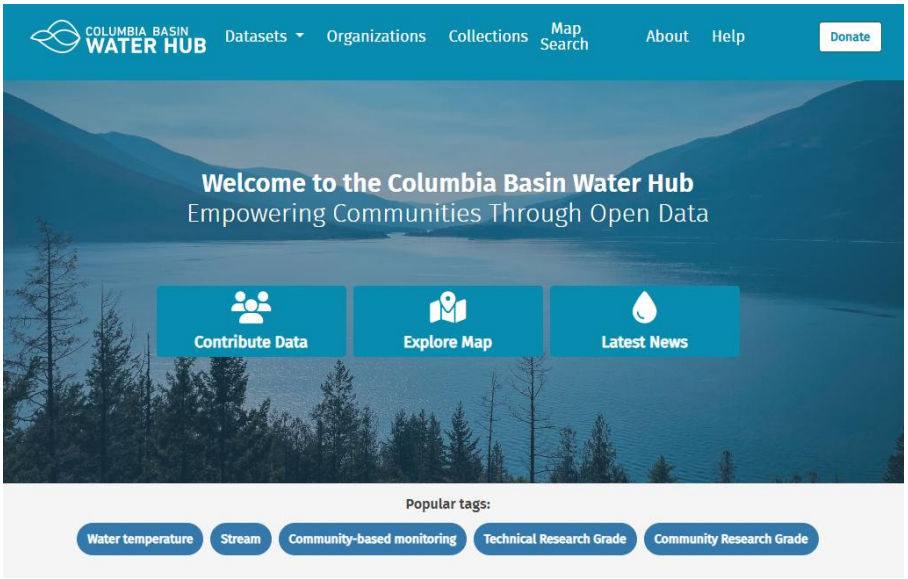
9. Columbia Basin Water Monitoring Framework: Informing climate resilience planning with high quality local data (Bryn-Thorn)

Presenter: Arlo Bryn-Thorn (he/they), Program Manager – Columbia Basin Water Monitoring Framework, Living Lakes Canada; www.LivingLakesCanada.ca

Leveraging Living Lakes' datasets from the extensive network of water and climate monitoring stations, the Columbia Basin Water Monitoring Framework has been supporting local decision making through informing regional representatives and rightsholders about current and historical trends of water movement throughout the Columbia Basin. This presentation highlights the Frameworks purpose and structure, describes the importance of the publicly-accessible Water Hub, and explores recent hydrological trends emerging from preliminary data from the 2025-2026 winter, onwards, as explored in the latest Watershed Bulletin.

The exceptionally warm 2025-26 winter brought rain instead of snow to many mid- and low-elevation areas. Some higher elevation areas in the East Kootenay retained more snowpack (e.g., Shepp Creek), and streams that drained from those areas maintained steadier summer flows. The West Kootenay experienced winter melt, earlier low flows, and relied on rainfall starting in mid-August to avoid severe drought in its mid- and low-elevation watersheds (e.g., Beaver Creek). High-elevation snowpack was bountiful this past winter, while many low-elevation areas saw record-breaking lows.

The data highlight how climate change is making water supplies increasingly unreliable when they originate predominantly in lower-elevation areas. Location-specific monitoring is essential as warm, wet winters with less snow are severely decreasing water reliability. The presentation concludes with insights from additional Living Lakes programming, supported by the Framework's datasets and professional network, that is improving community resilience and emergency preparedness in a changing climate.



10. Recovery of Chinook salmon (*Oncorhynchus tshawytscha*) in Canada above Grand Coulee Dam (Baxter *et al.*)

Presenter: James Baxter, Sn̓ʕay̓čkstx (Sinixt) Confederacy, Fish and Wildlife Division
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Co-authors: Herb Alex, Sn̓ʕay̓čkstx (Sinixt) Confederacy, Fish and Wildlife Division; Brian Miller, Casey Baldwin and Kirsten Brudevold, Confederated Tribes of the Colville Reservation, Fish and Wildlife Division



James Baxter presenting Recovery of Chinook Salmon above Grand Coulee Dam.

Abstract

The greatest obstacle to recovery of Pacific Salmon (*Oncorhynchus* spp.) in the upper Columbia River in Canada is achieving passage at Chief Joseph and Grand Coulee dams. Migration of salmon into Canada was blocked by the building of Grand Coulee Dam in 1941. Recently Tribes in the US and First Nations in Canada have focussed on addressing this issue. Since 2019 US Tribes have moved adult Chinook Salmon (*O. tshawytscha*) upstream of Grand Coulee Dam through trap and haul, and some of those fish have moved into Canada and successfully spawned. This presentation will focus on movement, spawning, and escapement studies (acoustic telemetry, drone surveys, aerial surveys) conducted in 2024 and 2025 by the Sinixt Confederacy in Canada and will also discuss the results in terms of relevance to Chinook Salmon recovery in Canada. Ongoing work in the US will also be reviewed.

Presentation

The presentation focussed on four main points. The notes below are a summary of the speaking notes written for this presentation.

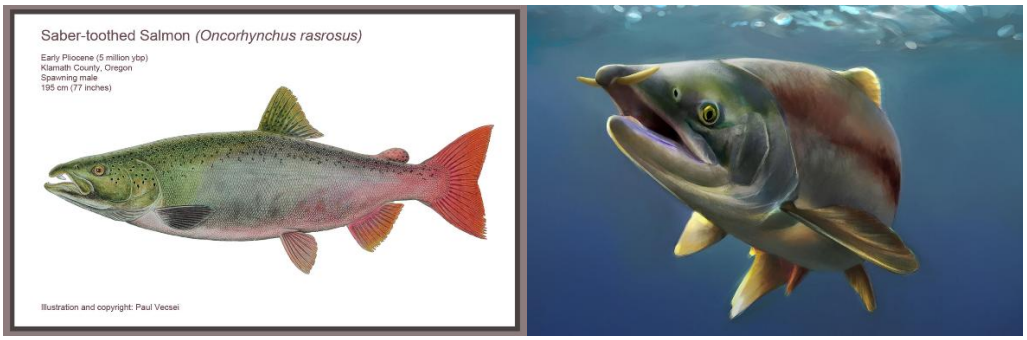
1. The rise. How the Columbia River became the greatest salmon river in the world, and the importance of salmon to the ecosystem and Indigenous peoples.
2. The fall. How the river got to the state that there were no salmon in the upper Columbia in Canada.
3. The road to recovery. How First Tribes and First Nations are leading the way to get salmon back above CJD and GCD, and the work ongoing.
4. And final thoughts.

The Rise

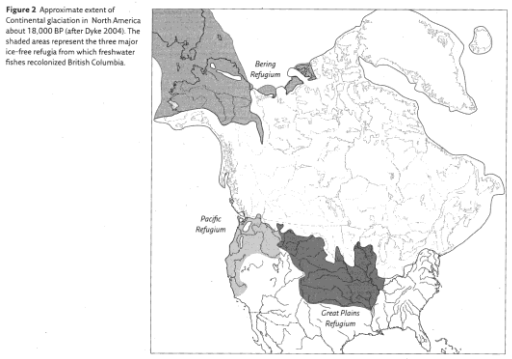
Salmon have been around for approximately 73 million years, and by 5 million years ago the six current anadromous species of Pacific Salmon and Trout had evolved (Chinook, Coho, Chum, Pink, Sockeye and Steelhead).



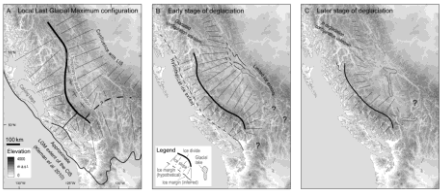
Interestingly there was also another salmon present around that time but it went extinct due to climate changes. It was known as the Saber-toothed Salmon. It was a filter feeder, and grew greater than 8 feet, and had tusks.



Before the last ice age there were salmon present in current day British Columbia (shown from fossil record) but 18000 years ago the slate was wiped clean and there were no salmon in the Columbia River in Canada. It was covered in ice. Salmon existed in the Pacific and Bering Refugia that was ice free.



As the ice retreated, salmon and people (and other animals) colonized BC and the Columbia system largely from the Pacific refugium.



And they were distributed throughout a very large watershed (15% lies in Canada, but it provides about 30% of the flow (coldwater)).



The river and its salmon sustained many Indigenous cultures across the Coastal, Plateau and Rocky Mountain regions, and the salmon were a keystone ecological species. Additionally, first peoples gathered annually at many significant fishing sites on the mainstem and tributaries for food and economics.



Pictured above is Kettle Falls (Sx̌ʷnitkʷ; “roaring water”). Other fisheries in Canada would have been at Bonnington Falls, Incomappleux River, and the outlet of Columbia Lake.

It is estimated that up to 16 million salmon returned annually (spring, summer, fall Chinook

Salmon).



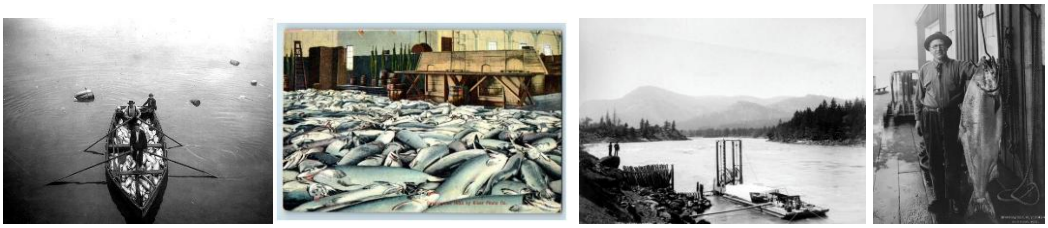
Indigenous People, the environment, and salmon developed a reciprocal way of life. Salmon were a food source. Salmon were used economically. Salmon were managed. And they contributed to the ecosystem aquatically, for wildlife, and in the forest.



And everything ran relatively smoothly in the upper Columbia River until the early 1800s.

The Fall

As North America was colonized, it all started to fall apart.



Commercial fishing in the ocean, canneries, instream fisheries, sport fisheries and dam construction all led to population declines.



This is Rock Island Dam, the first significant hydroelectric dam on the Columbia River in Washington, built between 1929 and 1933, and was the first dam to span the river. Coincidentally Rock Island Dam was built with fish passage facilities on each bank as part of its

original construction, which were later modified to improve fish migration.

Despite the reductions in salmon abundance, tribal fisheries continued as in the past because salmon were a way of life.



Salmon persisted and were still moving into Canada.

And then the final nail in the coffin came for the Kettle Falls fishery and salmon in the upper Columbia River in Canada. Grand Coulee Dam was constructed between 1933 and 1942. With migration completely blocked in 1940.



Rivers in Canada such as the Salmo and Slocan and Incomappleux lost their runs.



And the June hogs lost their access to the upper Columbia River. That unique race of Chinook is gone forever.



No passage was put in at Grand Coulee (which perplexes me as it was at other facilities). There is record of the Canadian Government not pushing for it. Instead, 3 hatcheries (Entiat, Leavenworth, and Winthrop) were built instead to compensate for salmon loss, but that didn't do anything for the upper river.



Local tribes held the Ceremony of Tears in 1940 at Kettle Falls to say goodbye to the salmon. And then things sat for a number of decades. The salmon were gone.

The Road to Recovery

Over time, U.S. Tribes and Canadian First Nations have taken the lead in establishing fish passage and reintroduction to the blocked areas upstream of Chief Joseph Dam and Grand Coulee Dam.

In 2015, the Columbia Basin Tribes and First Nations (CBTFN) finalized the Joint Paper “Fish Passage and Reintroduction into the U.S. and Canadian Upper Columbia Basin”. A phased approach.

Phase 1: Pre-assessment planning for reintroduction and fish passage. COMPLETE

Phase 2: Experimental, pilot-scale salmon reintroductions and interim passage facilities. ONGOING

Phase 3: Construct permanent juvenile and adult passage facilities and supporting propagation facilities. Implement priority habitat improvements.

Phase 4: Monitoring, evaluation, and adaptive management. Continue needed habitat improvements.

I can’t say for sure why this came to fruition when it did, but I believe for the Tribes and First Nations it’s the more wholistic view. That salmon are treated as relatives - to help them return is helping their relations and fulfilling their responsibility to the environment. Salmon are part of their identity and fabric of life. Salmon are in their DNA.

The story of she who retraces her steps is a story of hope – find it here: https://spokanetribalfisheries.com/news/.



In 2019 the Upper Columbia United Tribes1 (UCUT) completed Phase 1 with input from

Canadian FN's, and published its findings (UCUT 2019).

Phase 1 studies consisted of a reintroduction risk and donor stock assessment, multiple assessments of habitat availability and suitability, an evaluation of fish passage technologies at high-head dams, Grand Coulee and Chief Joseph dams' operations and configurations, and life cycle modeling.

Results from these studies indicate reintroduction of salmon to the blocked area could result in the production of 76,000 adult Sockeye Salmon and 44,000 adult summer/fall Chinook given current habitat conditions, available stocks of fish and with the construction of effective fish passage systems at existing dams.

Moving onto Phase 2, UCUT have been moving adult Chinook Salmon upstream of Grand Coulee Dam since 2019 via trap and haul as part of P2IP. Numbers have increased each year, and are based on surplus fish to hatchery and tribal needs, and capacity ($200 million in 2023). These adult Chinook Salmon are "naïve" in terms of them being placed into an area they haven't been reared (i.e., no imprinting).

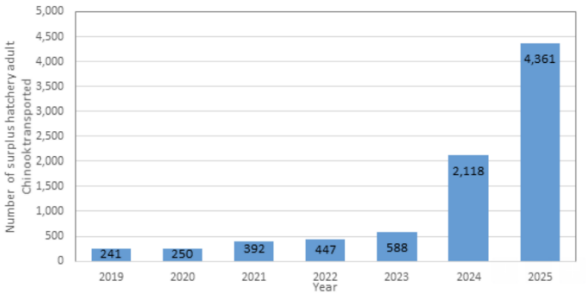


Figure 9. Number of surplus hatchery adult Chinook transported into the blocked areas of the Upper Columbia by year.



Some of these adults were implanted with acoustic tags in 2020 by UCUT (50), in 2022 by UCUT for CRSRI (58), in 2024 by UCUT for Sinixt Confederacy (59).

For 2024 tracked Aug 6, 2024. Tracked to Nov 29, 2024.

Drone monitoring work in 2024 was also done with partnership with Selkirk College in 2024.

For the 2024 acoustic study:

- 47 (79.7%) were tracked moving into Canada.
- 3 types of movement patterns.
- One-time movements into Canada for a short period of time with no spawning (A)-62%.
- Movements into Canada for a longer period and possible spawning (B)-26%.
- Multiple movements into Canada for varying periods of time with no spawning (C)-13%.
- Females averaged 11.8 days in Canada, while males averaged 14.0 days.
- 6 of the 47 tagged salmon (13%) that moved into Canada spawned at four locations.

- A total of 13 (28%) tagged salmon entered the Kootenay River, with 3 (6%) moving upstream to the base of Brilliant Dam.
- A total of 4 (8%) of the tagged salmon moved upstream to the base of HLK Dam (0.1 km). No salmon moved upstream into Arrow Lake through the boat lock at HLK Dam.
- Spawning started in the fourth week of September and was still going on at the end of October.



Figure 14. → Location of Chinook Salmon (*Oncorhynchus tshawytscha*) redds found at Genelle by ground surveys in September and October of 2024.



Figure 15. → Location of Chinook Salmon (*Oncorhynchus tshawytscha*) redds found at Norns Creek Fan by ground surveys in September and October of 2024.



In 2025 aerial enumeration flights to identify spawning areas from border to HLK and BRD.

Several flights conducted during spawning period.

Allows population estimates to be generated.

Also did drone work.

Final Thoughts

Most importantly this work is empowering the Tribes and First Nations in the recovery of salmon upstream of Grand Coulee Dam. In both countries. The approach is wholistic, and this is allowing the cultural connection of Sinixt and other First Nations to restore cultural identity with the return of their relatives (Canoe Journey and Nespelem Creek Fishery).

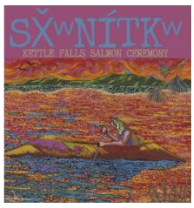
Trap and haul by UCUT partners allow Chinook Salmon to migrate into Canada and successfully reproduce (ecological connection being restored). Sturgeon are feeding. Algae and insects are growing. Other fish in turn are growing. This trap and haul method with continue during Phase 2 when possible, until hopefully passage at GCD and CJD happens.

Key spawning sites upstream of the border are being identified. This monitoring will continue.

Although not allowed to legally fish for them, many are being caught by anglers (social

connection restored).

‘Trap and haul’ is an accepted mitigation methodology and passage at Hugh Keenleyside Dam and Brilliant Dam should be moved forward.







Dare To Dream

Salmon are resilient. (Look at what they can do in where they are now).

Salmon know no borders. (Needs to be a collaborative unified approach. Salmon should be the focus, not politics).

The return of salmon will have immense cultural, social and environmental benefits. (Smile on faces when I talk to people about salmon recovery).

It can be done. In the words of DR Michel “One River, for the Benefit of All”.





Concluding slide with a special photo:

Limɬmtx

- I can take any questions if I have any time.



Rick Desautel-Sinixt Ceremonial Hunter

First Sinixt person to catch a Chinook Salmon in the Columbia River upstream of Grand Coulee Dam since construction in 1941.

pútiʔ alaʔəɬx – They are still here

11. Bringing the salmon home – Evaluating the feasibility of salmon reintroduction to historic habitat in the Columbia River upstream of Grand Coulee Dam (Zimmer)

Presenter: Michael Zimmer, Okanagan Nation Alliance. mzimmer@syilx.org

Co-authors: Patrick Zubick, pzubick@syilx.org and Marc Nelitz, ESSA Technologies Ltd., mnelitz@essa.com



Michael Zimmer presenting *Bringing the Salmon Home*.

The Canadian reaches of the Columbia River historically supported abundant salmon runs that sustained Indigenous fisheries throughout the Upper Columbia River. These included Sockeye salmon returning to the Arrow and Slocan Lake systems and Chinook salmon migrating to the headwaters. These runs were extirpated following the construction of Grand Coulee Dam, which blocked upstream fish passage. The loss of salmon has had profound cultural impacts on the Indigenous Nations of the Upper Columbia and has motivated efforts to evaluate the feasibility of salmon reintroduction to the region.

In 2015 tribes and First Nations along the entire length of the Columbia River co-developed the Joint Fish Passage Paper - a four-phase approach to bringing salmon back to the blocked portions of the river. In Canada in 2019, the Columbia River First Nations, along with the Province of British Columbia and Canada signed a Letter of Agreement to begin looking at the feasibility of reintroducing salmon back to the upper Columbia River.

In the Canadian reaches of the Upper Columbia River, these efforts are now being advanced through Bringing the Salmon Home: The Columbia River Salmon Reintroduction Initiative (CRSRI), a partnership between the Syilx Okanagan Nation, Secwépemc Nation, Ktunaxa Nation Council, Province of British Columbia, and Fisheries and Oceans Canada. CRSRI and its partners have conducted intensive field studies to evaluate key biological components of salmon reintroduction feasibility. Here, we present a historical summary of work conducted to date (in Canada and in the US) along with results from studies led by the Okanagan Nation Alliance (ONA) using PIT-tagged Sockeye fry to evaluate juvenile migration behaviour and survival, as well as a study using acoustic-tagged adult Sockeye salmon to characterize behaviour and movement within the Arrow Lakes. We also present the results of our life cycle model (LCM) that collates the data from all CRSRI projects to better understand bottle necks to salmon reintroduction.

Studies to date have shown sockeye fry released into Arrow Lakes and the Lower Columbia River (below Keenleyside Dam) can successfully navigate the numerous high-head dams, mature in the Pacific Ocean, and return as adults as far upstream as currently possible (Wells Dam, to the base of Chief Joseph Dam). Similarly, adult sockeye translocated from the Okanagan River (donor stock) to the Arrow Lakes show spawning tributary seeking behaviour with some attempting to spawn in tributary habitat (Deer Creek).

Together, these studies provide new information on the capacity of reintroduced salmon to migrate through, survive within, and utilize historical habitat in the Upper Columbia River. Over the coming years, we look forward to collaboratively advancing salmon reintroduction beyond feasibility testing.

Resources

- Welcome | CRSRI
- Fish_Passage_and_Reintroduction_into_the_US_And_Canadian_Upper_Columbia_River4.pdf
- SALMON-LETTER-OF-AGREEMENT.pdf

- Documentary: Bring the Salmon Home

Acknowledgements

We acknowledge our key partners on this work, the Ktunaxa Nation Council, Secwepemc, and the Governments of Canada and British Columbia.

Biographical notes

Michael Zimmer has worked on fish and fish habitat related issues in the Kootenay and Boundary regions since 1997. Working as a consultant, educator, and for the last 14 years, leads ONA's Columbia Fisheries team in Castlegar. Through the Syilx/Okanagan cultural lens, focusing on collaborative management of resident fish and related aquatic species including species at risk, invasive species monitoring and suppression, and for the last 10 years focused on bringing anadromous salmon back to the blocked portions of the Canadian Columbia River.

12. Affirming Indigenous data sovereignty in collaborative wildlife conservation in the era of open data (Tattersall *et al.*)

Presenter: Erin Tattersall, University of British Columbia ertattersall@gmail.com

Co-authors: Warren Cardinal-McTeague, University of British Columbia warren.cardinal-mcteague@ubc.ca; Isla Myers-Smith, University of British Columbia isla.myers-smith@ubc.ca; Samuel Haché, Canadian Wildlife Service samuel.hache@ec.gc.ca; Sambaa K'e First Nation, Sambaa K'e, Northwest Territories; Michael McPhee, Sambaa K'e First Nation lands@sambaakefn.com; Julian Russell, Sambaa K'e First Nation environment@sambaakefn.com; Desiree Louis, University of British Columbia desireehana.louis@gmail.com; Cole Burton, University of British Columbia cole.burton@ubc.ca

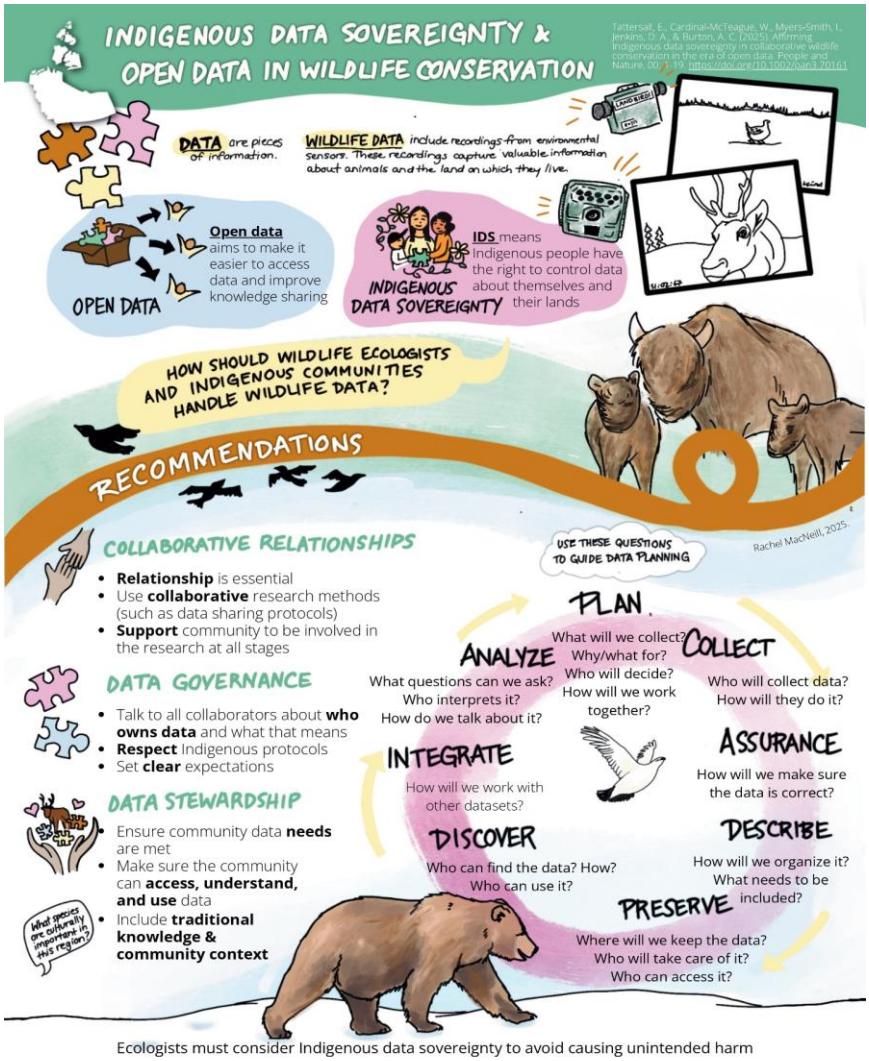


Figure 1: Accompanying infographic for Tattersall et al. 2025 (R. MacNeill).

In the current data-driven landscape of wildlife conservation, data sovereignty is fundamental to determining how knowledge is created and applied to pressing biodiversity concerns. Western science increasingly champions open data, uplifting data stewardship and sharing to make data more accessible. Concurrently, Indigenous Peoples stress the importance of Indigenous data sovereignty (IDS) to assert Indigenous rights over Indigenous data. These distinct philosophies create possible tensions in collaborations between Western scientists and Indigenous Peoples. Awareness of this issue in wildlife conservation is growing, and practical guidance is needed for balancing IDS and open data in collaborations.

In this research, we reviewed current literature to identify challenges in bringing IDS and open data together in collaborative wildlife conservation. We identify nine recommendations to navigate potential IDS and open data tensions in collaborations, stressing the need to focus on relationship-building, support Indigenous data governance, and to proactively discuss data stewardship expectations. We also suggest reflective questions to consider at each stage of the data life cycle, which provides a framework for supporting IDS throughout the collaborative process.

As an applied example, we present a co-designed case study with Sambaa K'e First Nation in which we explored how community perspectives can shape collaborative data governance in the context of wildlife monitoring with environmental sensors in the Northwest Territories. During a community workshop, Sambaa K'e participants discussed their intimate, intergenerational relationships with land and how this connection frames the Nation's research priorities. Their perspectives highlighted that wildlife data embody relationships between land, wildlife, Indigenous Peoples, and researchers and that this must be represented in collaborative data governance.

Altogether, our work demonstrates the need for explicit recognition of IDS principles for wildlife data and proposes general guidance for addressing data sovereignty in collaborative initiatives. It also emphasizes that consideration for relational value of wildlife data results in collaborations that are more meaningful to all partners and ultimately create stronger outcomes for wildlife conservation.

Biographical notes

Erin is a PhD candidate at the University of British Columbia, living and working remotely from Nelson, BC. Her research explores the intersection between 'big data' approaches to wildlife monitoring and Indigenous stewardship priorities in collaborations between Western scientific researchers and Indigenous groups. She works within the context of the Northwest Territories Biodiversity Monitoring Program (NWTBMP), a multi-collaborator initiative that uses remote cameras and acoustic recorders to monitor wildlife communities across the Northwest Territories to understand rapidly shifting habitat conditions under anthropogenic climate change.

Published Work

Tattersall, E., Cardinal-McTeague, W., Myers-Smith, I., Jenkins, D. A., & Burton, A. C. (2025). Affirming Indigenous data sovereignty in collaborative wildlife conservation in the era of open data. *People and Nature*, *00*, 1–19. https://doi.org/10.1002/pan3.70161

Tattersall, E., Sambaa K'e First Nation, McPhee, M., Russell, J., Louis, D., Cardinal-McTeague, W., Myers-Smith, I., Haché, S., Burton, C. (*in prep.*). What is the value of data? Connecting land relationships to wildlife data governance.

13. Evening Plenary: Secret lives of snakes and other unsung creatures of the lower Columbia (Dulisse)

Presenter: Jakob Dulisse, independent researcher



Long-time resident of the West-Kootenay, biologist, photographer and champion for creatures large and small – Jakob Dulisse – gave an engaging evening talk whereby he shared stories about his many years of wildlife research in the Lower Columbia. His talk included surprising discoveries involving snakes, spiders and other fascinating creatures. All who attended were captivated and inspired.

Find Jakob's photos on his Instagram account @jakobdulisse.

Find his most recent reports on the North American racers in BC's Inventory Explorer site here.



14. Rossland Forest Park project: A work in progress (Cameron)

Presenter: Eva Cameron, Rossland Sustainability Commission, Climate Adaptation Task Force. evamcameron@gmail.com

Co-Author: Anthony Bell

Vision

Create a Rossland Forest Park that conserves natural lands for wildlife, residents, and visitors.

The Forest Park initiative aims to:

- Limit urban sprawl and protect natural areas around the community.
- Conserve ecosystems by safeguarding wildlife habitat, ecological functions, and connectivity.
- Maintain public access for recreation and enjoyment of nature.
- Support wildfire resilience by enabling eligibility for provincially funded wildfire fuel treatments, where program criteria are met.
- Enable restoration and stewardship through ecological enhancement projects and long-term management planning.

To learn more about this project including its history, and next steps see the full poster here.

15. Central Kootenay Invasive Species Society - display (Carr)

Presenter: Laurie Carr, Central Kootenay Invasive Species Society (CKISS)



The CKISS display, including zebra and quagga mussel samples.

16. Local projects by the Rossland Streamkeepers (Coedy)

Presenter: Bill Coedy, Project Manager, Rossland Streamkeepers
rosslandstreamkeepers@gmail.com; Facebook @rosslandstreamkeepers

Rossland Streamkeepers performs small projects annually in educational water awareness and in monitoring local creek temperature, conductivity and flow. Educational awareness projects include the Trail Creek Watershed Interpretive Water Walk, the fabrication of portable 3D watershed terrain models and the collaboration with Grade 11 Crowe students on the annual health assessment of Beaver Creek. An example of an interpretive sign and watershed model will be on display.

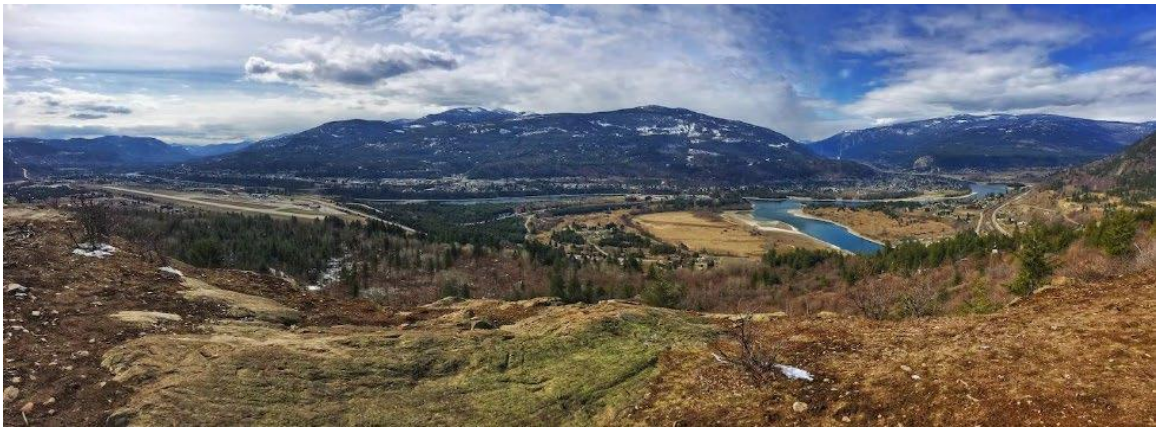
Science related projects include long term flow monitoring of Trail Creek and Topping Creek to determine annual hydrographs for water security and climate warming prediction purposes. Periodic snapshots of water quality within the Trail Creek watershed have illuminated interesting findings of ephemeral tributaries, geothermal minewater sources and continued pollution inputs from legacy industrial activity. Graphical analysis of metal and phosphorus concentrations of two streams in Warfield are presented.

Biographical notes

Bill Coedy has been involved with the Rossland Streamkeepers since retiring from his science career in the north and moving from Yellowknife to Rossland in 2015. The Rossland Streamkeepers is a local citizen science organization committed to water protection and security through educational awareness and stream monitoring. The Rossland Streamkeepers receives grant funding for its projects through partnerships with other non-profit organizations such as the Rossland Society for Environmental Action, WildSight and Living Lakes Canada.

17. Dove Hill brushland ecosystem enhancement (Dobie and Lin)

Presenters: Alysia Dobie, BSc, Forest Technician, tmxʷulaxʷ (Land) Technician, Okanagan Nation Alliance – Columbia Region adobie@syilx.org; Lindy Lin, Okanagan Nation Alliance



The Dove Hill brush land is an important mosaic of habitats inhabited by a wide range of ungulates, reptile and birds, including many species-at-risk. Impacted by fire exclusion, invasive species and human encroachment, the mallow ninebark -oceanspray -bluebunch wheatgrass brush land ecosystem (Gb03) is red-listed by the British Columbia Conservation Data Centre (BCCDC). Additionally, the Dove Hill trail network represents an important recreational value for Castlegar and the Kootenay Community, providing a significant opportunity to promote awareness of the importance of fire in ecosystem stewardship.

With long-term fire suppression and exclusion of cultural burning practices, brush land ecosystems have been altered through forest ingrowth, changes in vegetation structure, health and habitat values. These changes have also resulted in increased fuel loading and wildfire risk in areas adjacent to communities.

The project would seek to reintroduce low severity prescribed fire in prioritized treatment units in 26 ha of Dove Hill brush land. The aim is to enhance brush land health, protect native plant diversity and restore fire resiliency in a valued ecosystem to the benefit of both wildlife and community.

Project goals

- Enhance Resiliency in a Red-Listed Fire Adapted Ecosystem
- Restore Native Plant Diversity
- Incorporation of Indigenous Knowledge in Ecological Restoration
- Restore and Enhance Important Habitat for Ungulates
- Enhance and Protect Habitat for Species-at-Risk
- Protect Recreational Values and Promote Community Outreach Opportunities
- Increase Community Safety in the Wildland Urban Interface

Project activities

2026-2028: Invasive management, native plant enhancement (seeding/planting), burn preparation (thinning and large diameter tree protection).

2028: Prescribed burn.

2029-2030: Invasive management, native plant enhancement (seeding/planting).

Ecological and Cultural Values on the Land

- *Red-listed brush land ecological community*
- *Key winter ungulate range*
- *Community safety, infrastructure and recreational values*
  - This project aligns with Kootenay Boundary Higher Level Plan (KBHLP , and ongoing Ministry of Forest Wildfire Risk Reduction treatments (Figure 1) and increases landscape level fire resiliency and community safety.
- *Species-at-risk habitat include:*
  - ṗaʕs (Common nighthawk, *Chordeiles minor*)
  - Yellow-breasted chat (Icteria virens)
  - qʷayqʷaytʕaps (Western skink, *Eumeces skiltonianus*)
  - aslaiyaʔqnə kʷ̓uxʷkʷ̓uxʷap (Rubber boa, *Charina bottae*)
  - Fringed myotis (*Myotis thysanodes*)
- *Culturally important plant species observed include*:
  - síyaʔ (saskatoon, *Amelanchier alnifolia*)
  - ɬəx̌ʷɬax̌ʷ (chokecherry, *Prunus virginiana*)
  - ʕacʕacaqs (biscuitroot, *Lomatium triternatum*)
  - skʷlsiɬml’x (kinnikinnick, *Arctostaphylos uva-ursi*)
  - wəx̌wax̌iɬp (mock orange, *Philadelphus lewisii*)
  - stʷ̓yiʔ (bluebunch wheatgrass, *Pseudoroegneria spicata*)
  - q̓ʷəć̓q̓ʷć̓wixʷups (yarrow, *Achillea millefolium*)
  - ocean spray (*Holodiscus discolor*)
  - Orange honeysuckle (*Lonicera ciliosa*)
  - staxcin (Columbia lily, *Lilium columbianum*)
  - sx̌ʷəsmiɬp - the bush (soopolallie, *Shepherdia canadensis*)
  - mlmltiɬp (trembling aspen, *Populus tremuloides*)

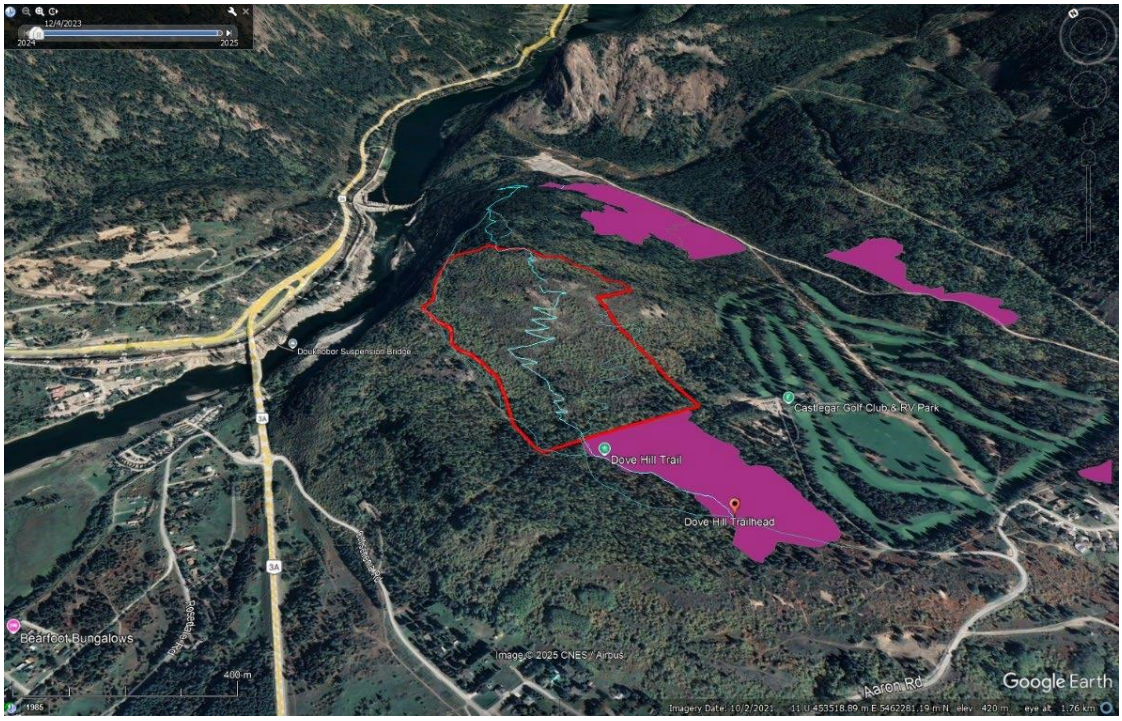


Figure 1. Ecosystem enhancement of red-listed brushland ecosystem, Dove Hill, east of the City of Castlegar. Total treatment area 26 ha (red boundary). Ongoing Wildfire Risk Reduction project, Airport Creek (purple). [Find the project webpage here.]

18. Chronic wasting disease: Poster and demo (Dolman & Archambault)

Presenters: Carley Dolman, Okanagan Nation Alliance cdolman@syilx.org; and Marcus Archambault, Okanagan Nation Alliance marchambault@syilx.org



Marcus Archambault conducting a CWD sampling demonstration.

Education, early detection, and rapid response of Chronic Wasting Disease (CWD) are key to prevent its' spread and protect the tmix^{w} and food sovereignty of all people. CWD affects cervid species including deer, elk, moose, and caribou. It is highly contagious among these species and leads to their gradual degeneration and eventual death, and has been detected in BC. In fact, the CWD Management Zone starts only ~10 km to the east from this Forum (in Rossland BC) as the crow flies.

Wide-spread surveillance by testing tissue samples from cervid heads is critical for quick and effective management of this disease, and without involvement from locals sampling of this magnitude would not be feasible. Join me to learn more about CWD, how you could contribute to this conservation effort, and how samples for disease testing are collected from the heads of deer species.

Freezer locations for cervid head drop-offs, with addresses and a map, can be found at CWD

Sample Drop Off Locations - Chronic Wasting Disease in British Columbia. The cwdbc.ca website is recommended as a resource for anyone interested in learning more about CWD, especially hunters, and includes how-to videos, articles, and summaries of regulations and recommendations. Anyone with questions or feedback about the program is welcome to contact Carley Dolman or Marcus Archambault at the Okanagan Nation Alliance; suggestions can be considered within the program and brought to the provincial CWD team.

SEE HERE FOR PDF VERSION OF THE POSTER

Biographical notes

Carley Dolman has worked for the Syilx Okanagan Nation Alliance for six years based in the eastern territory out of snɬuxʷqnm - Castlegar. She works on projects related to wildlife, plants, and habitat enhancement, with an interest in how ecological systems work together and interact with one another.

Marcus Archambault has worked for the Syilx Okanagan Nation Alliance for three years based in the eastern territory out of snɬuxʷqnm - Castlegar. He works on a variety of projects, with a focus on small animals (bats, snakes), and health and safety.

19. Creating new roosting habitat for bats in the Kootenays (Lafond and Lausen)

Presenter: Caroline Lafond, Okanagan Nation Alliance, Castlegar, BC clafond@syilx.org

Co-author: Cori Lausen, Wildlife Conservation Society Canada cLausen@wcs.org

Bat populations in British Columbia face multiple stressors, including changes in forest structure, disease, and climate change. In the West Kootenay, one of Canada's most diverse bat communities, 11 of 13 local species use tree features for roosting. The decline of mature and old-growth forests has reduced the availability of natural roosting features, such as loose bark and tree cavities. While bat boxes provide alternative roosting habitat, they are suitable for only a limited number of species.

Recent advances in artificial roost technology have provided new opportunities to address this habitat limitation. BrendanBark, an American-made artificial roost, mimics the microclimate and visual cues of natural bark roosts using large sheets installed by arborists around poles or standing dead trees. In 2025, Okanagan Nation Alliance joined Cori Lausen with Wildlife Conservation Society, and Selkirk College Innovate to collaborate on the design and local production of a smaller artificial bark roost prototype, the miniBark. MiniBark units provide a narrow crevice entrance and can be installed in groups of 2–4 on a single live tree, reducing costs and increasing installation accessibility.

To date, 32 miniBark units have been installed across the Kootenay region. Despite the first installations occurring in March 2026, bats have already been documented using these new artificial roosts. These preliminary observations suggest that miniBark may provide a promising and flexible tool for increasing artificial roosting opportunities and supporting bat conservation in landscapes where natural roost features are limited.

FIND PDF VERSION OF THE POSTER HERE

Biographical notes

Caroline Lafond has worked with the Okanagan Nation Alliance for the past two years, with a focus on wildlife conservation and habitat enhancement initiatives throughout the West Kootenay. Her work includes bat roost enhancement, wildlife connectivity along Highway 3 near Grand Forks to reduce amphibian and reptile road mortality, and the development of a habitat enhancement project for Western Painted Turtles. Her bat conservation projects, developed in partnership with the Wildlife Conservation Society and Kootenay Community Bat Project, focus on improving roost availability for local bat species. This work includes installing bat condos near existing roosts that are expected to become unavailable, as well as installing and monitoring artificial bat roosts in local forests.

20. Sina (beaver) habitat restoration on Golden's West Bench (Schulhof)

Presenter: Jenna Schulhof, Wildsight jenna@wildsight.ca; wildsight.ca

Sina (beaver) populations on the West Bench near ʔakuqɬuk (Golden), BC have been declining. Within the Ktunaxa understanding of ʔa·kxaṁis ḳapi qapsin (all living things), sina are part of the interconnected systems that sustain the health of ʔamak (land) and wuʔu (water). When ʔa·ḳankiɕqaʔis sina (beaver dams) are no longer maintained, wuʔu levels and summer stream flows drop, affecting the long-term health of wetlands, streams, and the many species that depend on them.

Supporting the return of sina helps restore balance across the landscape. Wetlands maintained by sina activity hold wuʔu longer into the summer, support riparian plant communities, and provide important habitat and refuge for wildlife. These living systems contribute to the resilience of forests and surrounding communities on the West Bench, particularly during periods of drought and wildfire.

Working with regional partners, like ʔAkisḳnuk First Nation, Wildsight is leading a five-year project across 16 hectares to support sina and the wetlands they sustain. Activities include manually enhancing existing ʔa·ḳankiɕqaʔis sina (beaver dams) and restoring riparian vegetation by planting preferred food sources such as ʔa·quɬuḳpak (willow), mukwuʔk (dogwood), and ʔa·kɬumak (aspen). The goal is to support conditions that allow sina from healthy populations in the nearby Columbia River to naturally return to higher elevation lakes and wetlands on the West Bench.

SEE HERE FOR PDF VERSION OF THE POSTER

Biographical notes

As the project manager, Jenna is guided by scientific advisor Dr. Annette Luttermann and the close partnership with ʔAkisḳnuk First Nation. Jenna is a trained wildlife technician having worked on projects with amphibians, songbirds, bats and multi-species mammal projects. As one of Wildsight's conservation specialists, her work on forestry and recreation issues in relation to wildlife conservation have given her valuable context and connections for this project.

FIELD TOUR

Friday, October 23 offered one field tour with multiple stops, thanks to a number of field tour leaders who guided us through a diversity of research and restoration projects within close proximity of the Waneta Dam and Pend d'Oreille areas.

Written summaries from field tour leaders were not collected. However, some resources associated with the discussions that took place have been included here.



1. Beaver Creek Park

Jakob Dulisse, independent researcher. *Regional herptile monitoring*, and the presence of North American Racers that underpin the creation of Beaver Creek Park.

- KCP's Stewardship Solutions: Report North American Racers and other reptile sightings. See here

Brian Bookhout, Kootenay Mycological Society. *MycoMap BC: Citizen science fungal collections for DNA sequencing*

- Find the MycoMap BC project here, including how to participate.

Angeline Emmott, Kootenay Native Plant Society restoration site. *Comparing native plant treatments amongst three dry sites (Beaver Creek being site 1)*

- Find more about the Beaver Creek Monarch Waystation Learning garden here



2. Trail Airport, Selkirk College restoration site

Megan Drake, Applied Environmental Science and Planning Technology, Selkirk College
Mike Hounjet, Columbia Power
Angeline Emmott, Kootenay Native Plants: *Comparing native plant treatments amongst three dry sites (dry site #2)*

- See proceedings submission #2 for more details on this site.



3. ***Waneta worksite F restoration site***
   Mike Hounjet, Columbia Power. *Industrial restoration on a dry site*
   Angeline Emmott, Kootenay Native Plants restoration site. *Comparing native plant treatments amongst three dry sites (dry site #3)*

Resources

- Waneta Hydroelectric Expansion Project Assessment Report (EAO and DFO)
- Waneta Hydroelectric Expansion Project Owners Requirements for Construction
- Columbia Power – Waneta Expansion Project, Environmental Stewardship



4. ***Salmon reintroduction, sturgeon, and invasive mussels***
   Parking location is here
   James Baxter, Sinixt Confederacy, Fish and Wildlife Division
   - https://www.uppercolumbiasturgeon.org/
   - Columbia River White Sturgeon Management Plan
   - Lower Columbia River fish management plan
   - Sinixt Confederacy Reports Out on 2024 Chinook Salmon Work - Sinixt

   Khalish Frasker, Central Kootenay Invasive Species Society. *Invasive mussel detection*
   - Invasive mussels in BC: The risk, the response and how you can help
   - Whirling Disease in Southeast BC – Online Training



5. ***Rare brushland ecosystems, yellow-breasted chats, and Pend d'Oreille and Fort Shepherd management of conservation lands***
   Irene Manley, Ministry of Water, Land and Resource Stewardship. *Pend d'Oreille and Fort Shepherd management of conservation lands.*
   - Resources coming

   Thomas Hill, Thomas Hill Environmental. *Rare brushland ecosystems and best management practices*
   - Webinar: Management and Restoration of Brushlands and other dry ecosystems of the West Kootenays (scroll down to season 10)
   - Conservation, Restoration and Stewardship of Low Elevation Brushland (Gb), Grassland (Gg) and Dry Forest Ecosystems in the West Kootenay Region, Version 7, Field Manual

- Conservation, Restoration and Stewardship of Low Elevation Brushland (Gb), Grassland (Gg) and Dry Forest Ecosystems in the West Kootenay Region, Version 7, Background Information Document

Kristen Mancuso, Okanagan Nation Alliance. *Yellow-breasted Chat monitoring in the West Kootenays*

- Learn more about the ONA's species at risk monitoring and conservation efforts here.
- Find the reporting on Yellow Breasted Chat monitoring in the Kootenay region here



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Find this proceedings and all other major documents produced by CMI here.