Grant County
PUBLIC UTILITY DISTRICT
Excellence in Service and Leadership

PRCC Habitat Subcommittee

Conference Call

Thursday, 8 December 2022
11:00 a.m. – 2:40 p.m.

Meeting Minutes

PRCC Habitat Subcommittee Members

Kate Terrell, USFWS	Chris Fisher, CTCR
Dave Duvall, Deanne Pavlik-Kunkel (alt), GPUD	Brandon Rogers, Hans Smith (alt), YN
Justin Yeager, NMFS	Carl Merkle, CTUIR
Jeremy Cram, WDFW	Erin Harris, GPUD
Nathan and Clayton Buck, Wanapum	Tracy Hillman, BioAnalysts, Facilitator

Meeting Attendees

Justin Yeager, NMFS	Dave Duvall, GPUD
Hans Smith, YN	Kate Terrell, USFWS
Jeremy Cram, WDFW	Chris Fisher, CTCR
Deanne Pavlik-Kunkel, GPUD	Erin Harris, GPUD
Tim Taylor, GPUD	Tom Dresser, GPUD
Tracy Hillman, BioAnalysts	

Action Items:

- Jeremy Cram will find out if the Libby Acquisition Project can be closed.
- Chris Fisher will share the 2018-2022 Fish Passage Monitoring at McIntyre Dam report with the PRCC Habitat Subcommittee (PRCC HabSC).
- Chris Fisher will inform the Okanagan Nation Alliance that they are welcome to submit a specification sheet requesting funds to modify Gate 5 at McIntyre Dam.
- Dave Duvall will contact Cascade Fisheries to discuss the additional insurances required by Grant PUD.

Decision Items:

- PRCC HabSC members present agreed to close the Weyco (Weyerhauser) Mill Creek Land Acquisition – CDLT Developmental Funding/Final Acquisition Project.
- PRCC HabSC members present approved the Big Meadow Creek Fish Passage Restoration Project budget amendment for an additional $26,240. This additional funding will help Cascade Fisheries purchase the additional insurance required by Grant PUD.
- PRCC HabSC members present reviewed and approved the contract language for the Sage Acquisition Project.

I. Welcome and Introductions

Tracy Hillman welcomed everyone to the meeting and participants introduced themselves. Tracy noted that the PRCC Habitat Subcommittee and HCP Tributary Committees will meet jointly for the Nason Ridge Update by Chelan County Natural Resources Department and Enloe Dam Presentation by CTCR. Following the presentations, the PRCC HabSC will take a short lunch break and reconvene to discuss PRCC HabSC items.

II. Nason Ridge Project Update (with the HCPs Tributary Committees)

Mike Kaputa (CCNRD) and Erin McKay (CCNRD) joined the meeting to update the Tributary Committees and PRCC HabSC on the conservation measures implemented on the Nason Ridge property. A requirement associated with funding this project was that the sponsor will provide annual updates on the conservation measures implemented on the property acquired with Plan Species and PRCC HabSC funds. This was the first update since the property was acquired with Plan Species and PRCC HabSC funds.

Erin began by providing a brief update on ongoing restoration actions on the property. She said the focus has been on property access planning and recreational planning. She noted that subgroups meet every month, while the larger group meets quarterly. They are currently working on recreational planning and what public access will look like, all of which are outlined in the Nason Ridge Community Forest Management Plan. Erin identified the expected outcomes of recreation and access planning and said they are identifying specific recommendations for recreation and access on the Community Forest including identification of pathways. In addition, they are identifying recreation issues and opportunities, developing a plan to leverage funding opportunities, and making sure recreation and access recommendations are aligned with other management goals, especially aquatic management goals.

Erin indicated that the Community Forest Management Plan includes goals for community benefits, aquatic resources, road management and sediment reduction, forest health/resiliency, and invasive species management. The Plan also includes goals for recreation, public access, and education. She said they are actively decommissioning roads. They have decommissioned about 5 miles of roads and removed 13 culverts. They are currently evaluating additional road decommissioning opportunities based on erosion potential and recreational planning. She added that they are working on a perimeter road blowout (stream crossing), which is a high priority action because of the risk of road prism failure. They are designing a 40-foot-span bridge with funding from the Salmon Recovery Funding Board and Ecology. Construction is planned for 2023.

Erin indicated that they are working on improving forest health and reducing fuels. In 2022, they created a 62-acre shaded fuel break and conducted thinning work along the perimeter road. They also burned

relic waste piles left by Weyco. In 2023, they plan to replant conifers in the floodplain. Erin noted that they are also implementing invasive species management actions, which include diffuse knapweed spraying along the perimeter road, summit road, and decommissioned road segments. They are also planning biocontrol actions for larger infestations. They continue to work on the Nason Kahler Habitat Project, which is designed to improve spring Chinook and steelhead spawning and rearing habitat by installing engineered log jams, floodplain restoration, and decommissioning a road. This project is moving forward with funds from the Salmon Recovery Funding Board. Associated with this project, the County is designing an alluvial water-storage project on Kahler Creek and working on another project at the mouth of Kahler Creek.

Erin then identified the recreation and access objectives. Those include: (1) provide access to enjoy open space and recreation opportunity, (2) continue to increase opportunities for non-motorized recreation, (3) increase opportunities for both summer and winter recreation, (4) provide recreation and education opportunities for children and underserved communities, and (5) provide quality hunting opportunities. As outlined in the Management Plan, they will work with community members, recreational interests, and neighboring landowners to address the recreation objectives.

Erin indicated that they plan to present to the Committees again late next year; however, if the Committees want more frequent updates, she will provide those. Members of the PRCC HabSC and Tributary Committees had no questions and thanked Erin and Mike for the update.

III. Enloe Dam Presentation by CTCR (with the HCPs Tributary Committees)

Chris Fisher gave a presentation on Enloe Dam to the PRCC HabSC and HCP Tributary Committees (see Attachment 1). Chris began by providing historical background on Coyote Falls and Enloe Dam and identified the location of the dam on the Similkameen River in the Okanogan River basin. Chris provided a bit of history on the construction of Enloe Dam and a summary of recent events, including Okanogan PUD's interest in relicensing the project beginning in 2008, tribes passing resolutions supporting removal of the dam, Okanogan PUD's decision to cease re-electrifying the dam, and the termination of the FERC license in 2019. Chris then described the work that has been completed since the FERC license was terminated.

Chris described the sediment sampling that occurred in the pool upstream from the dam. He identified the locations where samples were collected in 2019 and said analyses of samples tested for concentrations of trace elements (e.g., mercury, copper, arsenic, lead, silver, gold, nickel, and others) and total organic carbon. They also analyzed isotopes of cesium and lead to age samples. Chris showed some of the sediment quality results from the sediment analysis and pointed out potentially hazardous elemental concentrations (those that exceeded Threshold Effects Concentrations). He also identified areas within the project area where various elements were found and indicated their concentrations. He stated that the highest concentrations of arsenic, copper, and cadmium were located near the historical riverbed and concentrations decreased from the historical riverbed elevation up to the current riverbed elevation (i.e., concentrations of these elements increased with depth).

Chris then described the additional sediment sampling work funded by Ecology in 2022. This work included additional core sampling to help characterize sediment at depth and leaching analysis to sediment material, which allows estimation of contaminant binding ability to the sediment. Sub-bottom profile work was not conducted because it was determined that the USGS sub-bottom profile did not need supplemental sampling. Results from this work should be available by April 2023.

Chris spoke briefly about the navigability of Coyote Falls/Similkameen Falls, which is located just downstream from the dam. Flow statistics were used to populate a hydraulic model to determine

hydraulic conditions for adult steelhead and spring Chinook salmon passage. The model identified viable pathways at modeled flows. Overall, there are six hydraulic pathways that open and close to steelhead and spring Chinook passage at different flows (270-17,000 cfs). This work indicates that there are different pathways adult steelhead and spring Chinook can use to pass the falls during upstream migration.

Chris discussed the modeling work that was completed by the NOAA Science Center to determine available spawning and rearing habitat for steelhead and Chinook upstream from the dam. The potential extent of anadromy was determined using information on known barriers, ground surveys, and stream slope. This exercise indicated that of the 5,504 km of stream upstream from the dam, 2,446 km are potentially available to steelhead and spring Chinook. A model was then used to estimate available spawning and rearing habitat available upstream from the dam. The model translated available habitat into habitat capacity (maximum number of fish under full seeding) for parr and spawners. This effort indicated current habitat upstream from the dam could potentially support 3.9M Chinook parr and 9.8M steelhead parr. Depending on parr-adult survival rates, Chris said this equates to about 7,800-47,000 adult spring Chinook and 29,000-118,000 adult steelhead. As a comparison, Chis said returns of natural-origin steelhead to the Okanogan River basin ranged from 87-271 during the last four years. Chris commented that water temperatures upstream from Enloe Dam are considerably cooler than temperatures recorded in Omak Creek, where steelhead currently spawn and rear.

Finally, Chris showed pictures of Enloe Dam and the pool upstream from the dam during a period in 2022 when the dam was dewatered for a required safety inspection. He pointed out the seams in the dam but noted there was no or little water leakage through the seams.

In summary, Chris stated that initial sediment sampling revealed elevated levels of arsenic, copper, and cadmium in isolated areas. Results from additional sediment sampling funded by Ecology will be available in an interpretive report in early 2023. He said both adult steelhead and spring Chinook can navigate the falls and that there is habitat upstream from the dam to support millions of parr (estimates will be refined this winter). Chris said the next step is to conduct a feasibility study (pending funding) and, if feasible, prepare a 30% design to deconstruct the dam.

Jeremy Cram cautioned Chris not to set unrealistic expectations about parr production upstream from the dam. Jeremy indicated that the parr estimates are very likely overestimates and therefore adults expected to return from those parr numbers are likely much lower than projected. Justin Yeager asked if there are falls buried upstream from the dam that could limit fish passage once the dam is removed. Chris said, based on his examination of photos before dam construction, there is no indication that impassable falls exist within the current impounded area.

The PRCC HabSC and Tributary Committees thanked Chris for the presentation and asked Chris to share the interpretive report once it is available.

IV. Lunch Break

V. Welcome and Introductions

Tracy Hillman welcomed everyone to the meeting and participants introduced themselves.

VI. Agenda Review

The PRCC HabSC reviewed and approved the December agenda with two additional item: (1) a presentation on the Okanagan Falls Floodplain Reconnection Project and (2) Review Contract Language for the Sage Acquisition Project.

VII. Approve November Meeting Notes

PRCC HabSC members reviewed and approved the 10 November 2022 meeting notes.

VIII. Review Action Items

The PRCC HabSC reviewed the following action items from the November meeting:

- Jeremy Cram will find out if the Libby Acquisition Project can be closed. **Ongoing.**
- Dave Duvall will have the Grant PUD attorney review the revised Deed of Right template. **Completed. Dave Duvall indicated that the Grant PUD attorney is reviewing the deed of right template and will complete the review before the January meeting.**
- Dave Duvall will contact Mickey Fleming (Chelan Douglas Land Trust) to see when the last invoice on the Toole/Mardini/Jawa Acquisition Project will be submitted. **Completed.**
- Tracy Hillman will contact Mike Kaputa (Chelan County Natural Resources Department) to make sure Brandon Rogers and Justin Yeager are invited to participate on the Nason Ridge Stewardship Committee. **Completed.**
- Dave Duvall and Tracy Hillman will update the project list before the next meeting. **Completed.**
- Tracy Hillman will contact Jason Lundgren and ask him for three quotes for each insurance requirement ($10M Umbrella policy and pollution liability) for the Big Meadow Creek Fish Passage Restoration Project. **Completed.**
- Dave Duvall will coordinate with the Grant PUD Risk Department to make sure they understand the risks associated (or lack of risks) with the Big Meadow Creek Fish Passage Restoration Project. **Completed.**

IX. Project Updates

Members of the PRCC HabSC provided the following updates on funded projects:

- **Toole/Mardini/Jawa Acquisition Project** – Dave Duvall said he is waiting for a final invoice on this project. Once that is received, he will close the contract.
- **McIntyre Dam - Fish Jumping Efficiency Project** – Chris Fisher reported that he recently received the McIntyre Dam Fish Passage Monitoring Report, which describes the upstream passage success of adult sockeye salmon under different gate configurations during low flows. Okanagan Nation Alliance (ONA) counted the number of passage attempts and the number of successful attempts. Attempts per hour were highest at Gate 5, which is located along the right bank; however, the success rate was low. That is, of 570 passage attempts per hour at Gate 5, only 6% were successful. Gate 1 had fewer attempts (50/hour) but a higher success rate (14%). When Gate 3 (center gate) was the only open gate, the passage attempt rate there was 23/hour with a 7% success rates. Chris said flow through Gate 5 creates a wave curl off the wing wall that appears to attract the fish but limits passage success. He recommended that ONA modify Gate 5 so it does not create a wave curl. Chris said there is about $9,000 left in the budget that could be used to design a potential fix. Dave Duvall suggested closing the project and believes ONA should submit a specification sheet that would fund modifications to Gate 5. All members present agreed with Dave's suggestion. Chris will share the passage monitoring report with the PRCC HabSC and ask ONA to submit a specification sheet to the PRCC HabSC for funding to modify Gate 5.

- **Lower Wenatchee Instream Flow Enhancement Project, Phase II Project** – Kate Terrell stated that Trout Unlimited (sponsor) met with the Jones Shotwell Ditch Company (JSDC) directors and mapped out next steps. The sponsor intends to meet with JSDC's attorney in December. In addition, the sponsor continues to work on the project timeline, grant applications, project permitting, and engineering reviews.
- **Weyco (Weyerhauser) Mill Creek Land Acquisition – CDLT Developmental Funding/Final Acquisition Project** – No new activity on this project. Kate Terrell noted that the property was purchased by a private entity and it therefore can be closed. Jeremy Cram agreed and said if something new comes up, the sponsor can submit a new specification sheet. Members present agreed to close this project.
- **Icicle-Peshastin Irrigation District Fish Screen Project** – No new activity on this project. Jeremy Cram indicated he will check on the status of this project and report back to the PRCC HabSC.
- **Assessment of Sediment Chemistry Behind Enloe Dam on the Similkameen River Project** – Chris Fisher said this project can be closed.
- **Ben Canyon Creek Fish Passage Project** – Kate Terrell reported that the project is complete. Final invoices should be received soon. The contract can then be closed.
- **Cascade Orchards Icicle Creek (COIC) Flow Restoration Project** – Justin Yeager reported no new information on this project. He said construction is scheduled to occur in summer 2023. He added that the sponsor is finalizing paperwork.
- **ORRI VDS Backwatering Project** – Chris Fisher said there is no new update on this project.
- **Shingle Creek Fish Passage** – Dave Duvall said he will close this contract after he receives the final invoice. Dave will check with ONA on when the invoice will be submitted.
- **Sage Enterprises Acquisition – Sugar Reach** – Dave Duvall said the PRCC HabSC needs to review and approve the contract language (see Section XII). He added that the full legal description will be sent to him at a later date.
- **Lower Trout Creek Re-naturalization: Stage 1 Construction** – Chris Fisher reported that the PRCC HabSC visited this site during the tour. There is no new update on this project.
- **Big Meadow Creek Fish Passage Restoration Project** – Kate Terrell reported no new update on this project. The sponsor is working through insurance requirements associated with the Grant PUD contract (see Section X).

X. Restoration/Protection Projects

Big Meadow Creek Fish Passage Restoration Budget Amendment – Tracy Hillman said that he and Dave Duvall received insurance quotes from Cascade Fisheries (sponsor). The cost to purchase the $10M liability umbrella was $11,027 and the cost to purchase the pollution policy was $15,213. Thus, the total cost for the required insurance is $26,240. The sponsor indicated that they do not have funds available to cover the cost of the additional insurance; therefore, they are requesting a budget amendment that will cover the cost of the additional insurance.

Tom Dresser, Grant PUD, stated that Grant PUD's Risk Department now requires the additional liability insurance, pollution insurance, and watercraft insurance. Grant PUD requires a higher level of coverage because of litigation and insurance claims that have been filed. Thus, Grant PUD's risk tolerance has changed. Tom remarked that other funding entities may not require this level of insurance because they

lack awareness and they may have a different risk-tolerance level. Tom added that the insurance underwriters have identified restoration work as having a relatively high level of risk. That said, the amount of the insurance required may vary depending on the project type and level of risk. Tom noted that the premium costs are also driven by the reputation of the sponsors and insurance companies offer better prices to sponsors with more experience. Unfortunately, there is no way to predict the level of coverage that will be required.

Chris Fisher asked whether all sponsors receiving PRCC HabSC funds will be required to carry this insurance. Tom said, yes, all sponsors will need to carry this insurance; however, the level of insurance will vary depending on the type of project, sponsor reputation, and risks associated with the project. Projects with higher risk will need to carry more insurance. Grant PUD's Risk Department will evaluate each project and identify the level of insurance needed. Thus, projects are evaluated on a case-by-case basis. Hans Smith noted that subcontractors may already have the required amount of insurance. If so, they would need to add the project sponsor to the insurance. If they do not, they would need to purchase it and add the sponsor to the insurance, or the sponsor purchases it and adds the subcontractors to the insurance. Regardless, the cost of the insurance would be passed on to the sponsor, who would then pass it on to the funding entity. It is unlikely the sponsors or the subcontractors carry the level of insurance required by Grant PUD. Hans added that the sponsor would identify the level of insurance required during the bid process.

Given that Cascade Fisheries does not have the funding available to purchase the additional required insurance, Tracy asked members present if they approve adding $26,240 to the Big Meadow Creek Fish Passage Restoration Project. The total amount from the PRCC HabSC would increase from $295,500 to $321,740. All members present approved the budget amendment.

Decision: *PRCC Habitat Subcommittee members approved the Big Meadow Creek Fish Passage Restoration Project budget amendment for an additional $26,240. This additional funding will help Cascade Fisheries purchase the additional insurance required by Grant PUD.*

XI. Information Updates

Restoring Riverscapes Workshop: Advancing Process-Based Actions – Tracy Hillman reported that NOAA Fisheries will host a virtual Restoring Riverscapes Workshop in 2023 that focuses on advancing process-based restoration actions. The goals of the workshop are to discuss the principles and benefits of process-based restoration actions, dive into the challenges these approaches present, and work on solutions to encourage robust, region-wide implementation. The workshop will examine process-based restoration, provide riverscape restoration examples, explore constraints and solutions, and describe the road ahead. The workshop will occur over a three-day period on 7-9 March 2023. Registration for the workshop will open on 3 January 2023. It was recommended that members of the PRCC HabSC sign up for the workshop.

UCSRB Floodplain Science Workshop – Tracy Hillman reported that the Upper Columbia Salmon Recovery Board (UCSRB) will host a Floodplain Science Workshop on Tuesday, 24 January 2023. This workshop will replace the Science Conference the UCSRB would have hosted in 2022 but was cancelled because of the pandemic. Tracy said the one-day workshop in January will focus on floodplain reconnection projects and their biological benefits.

Okanagan Falls Floodplain Reconnection Project – Chris Fisher provided a quick update on discussions surrounding the reconnection of the large floodplain located between Skaha and Vaseux lakes on the Okanagan River in Canada (see Attachment 2). Chris showed a slide that identified the historical river pathway, including meander paths, islands and side channels, connected wetlands, sloughs, riparian

vegetation, and habitat diversity. He then showed a slide that depicts the current conditions. A long dike currently disconnects the floodplain from the river. Chris said one of the largest restoration opportunities in this reach is to reconnect the floodplain. He added that Ducks Unlimited has been a major constraint to reconnecting the floodplain, because they want to maintain the existing wetlands. During a meeting last week, in which the Environment and Climate Change Canada attended, different concepts were presented to reconnect the floodplain. During that meeting, Environment and Climate Change Canada indicated that this would be a good project to help moderate water temperatures in the Okanagan River. Indeed, they will provide approximately $1M over a four-year period to reconnect the floodplain. Currently, the two restoration concepts include (1) adding culverts and a riffle and (2) removing the dike. Chris said he will share more information as the conceptual designs evolve.

XII. Administration

Contract Language for the Sage Acquisition Project – Dave Duvall shared the proposed language changes to the MSRF Sage Acquisition Project contract. The changes are consistent with the language in the PRCC HabSC Operating Procedures. All members present approved the revised contract language.

Decision: *PRCC Habitat Subcommittee members reviewed and approved the contract language for the Sage Acquisition Project.*

XIII. Adjourn

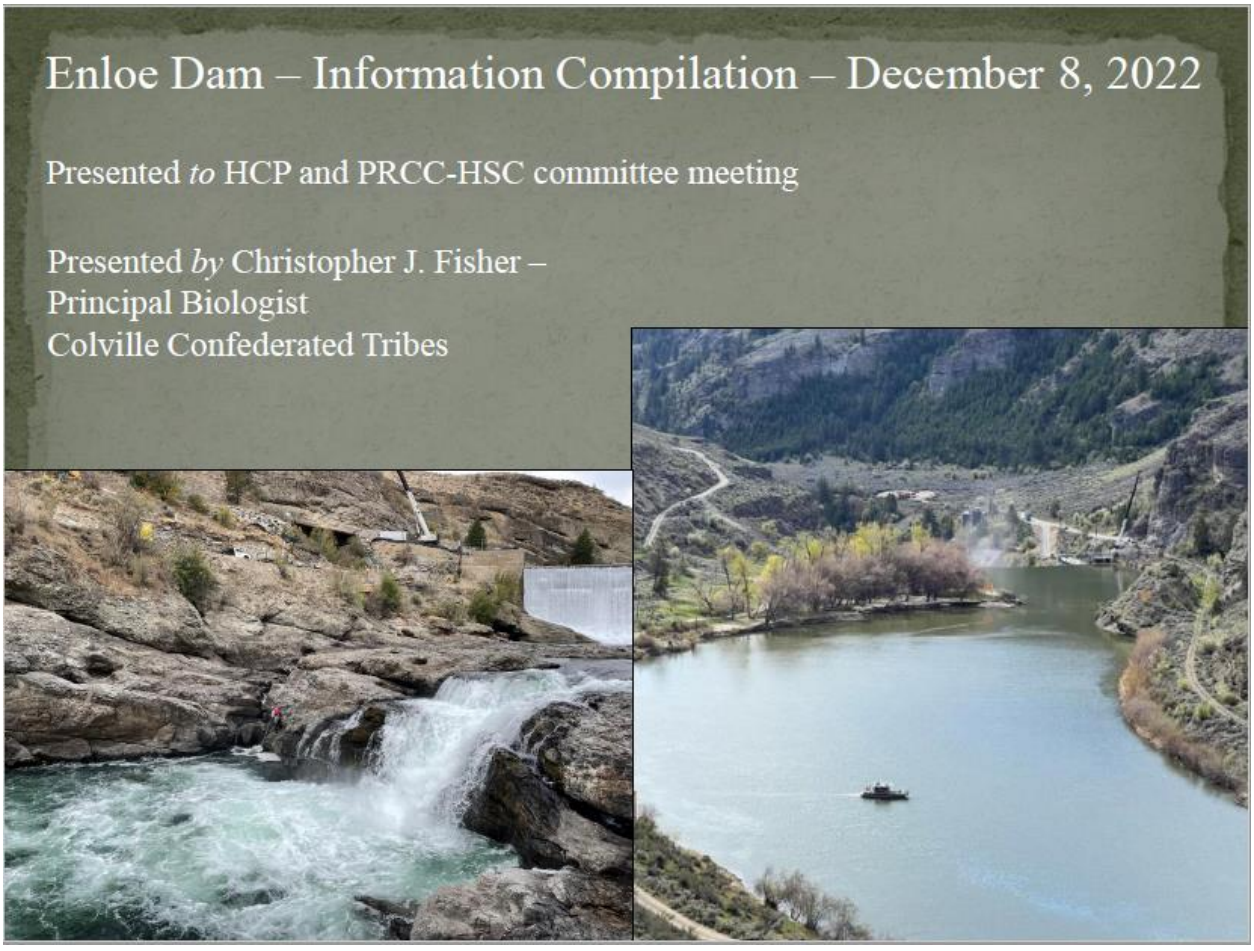
Tracy Hillman adjourned the meeting at 2:40 pm.

XIV. Next Meeting

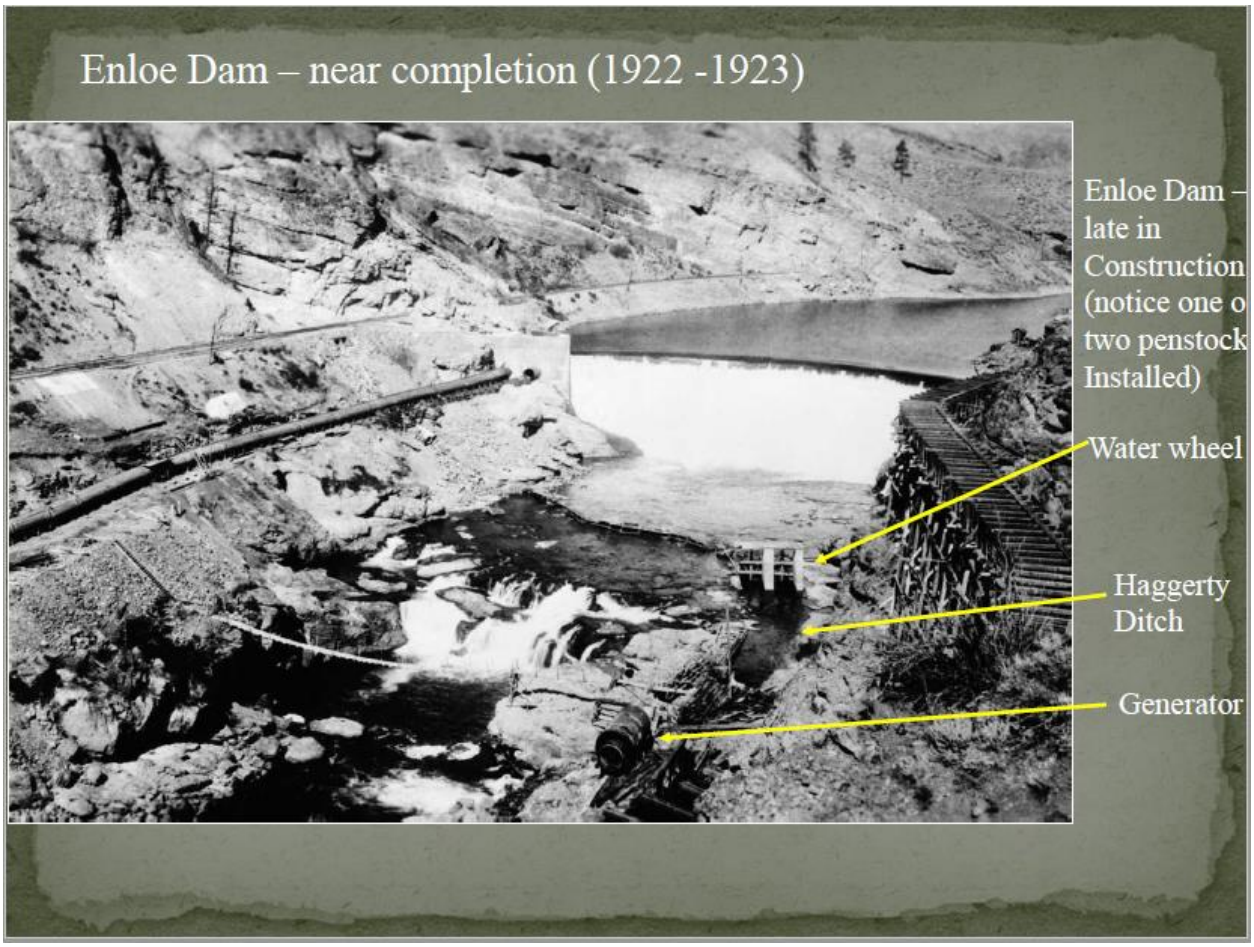
The next meeting of the PRCC HabSC will be on 12 January 2023.

Attachment 1

Presentation by Chris Fisher on Enloe Dam




Location
Enloe Dam
Osoyoos
97
Driscoll Island
Eyhott Island
Image © 2007 DigitalGlobe
© 2007 Europa Technologies
© 2007 Tele Atlas
Image © 2007 TerraMetrics
Google

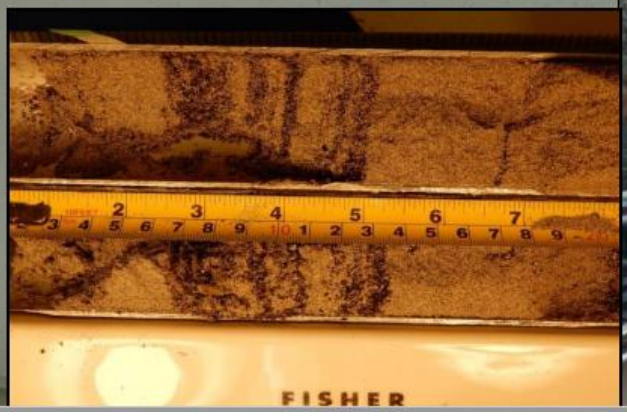

Enloe Dam – near completion (1922 -1923)
Enloe Dam – late in Construction (notice one o two penstock Installed)
Water wheel
Haggerty Ditch
Generator

Recent History

- Beginning in 2008, Okanogan Public Utility District initiated the relicensing to produce electricity at Enloe Dam
- Lower Similkameen Indian Band (2015), Colville Confederated Tribes (2017), Upper Similkameen Indian Band (2021) pass resolutions to support removal of Enloe Dam
- November 19, 2018: Okanogan Public Utility District ceased re-electrifying Enloe Dam, being cost prohibitive (Wells Dam = $12.03 MW, Enloe Dam = $150.53 MW)
- July 2019, FERC License terminated. Washington Dept. Ecology oversees safety of structure.

Overview

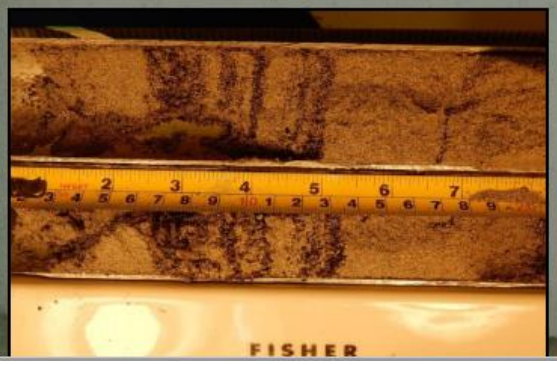
- Sediment sampling – results
- Continued sediment sampling locations, disposal sites
- Navigability of falls steelhead and spring Chinook salmon
- Capacity potential of existing habitat
- Environmental conditions
- Next steps

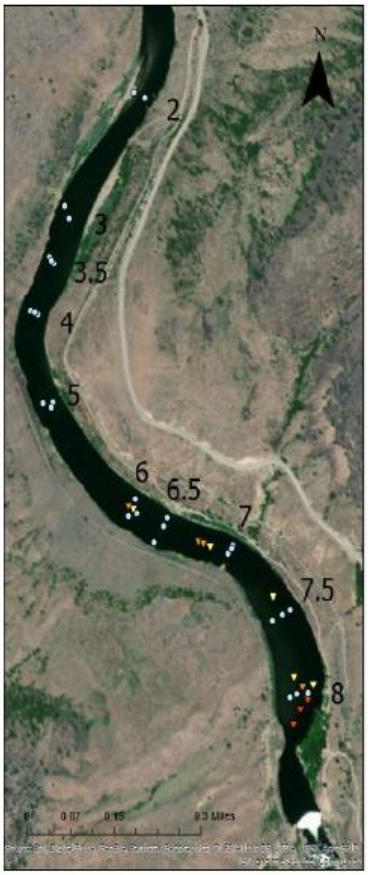


- August 2019, funding secured to conduct sediment sampling
- Sediment sampling conducted from October to December

Testing for concentrations of:

- Trace elements:
  - Hg, Cu, As, Pb
  - Au, Ag, Ni (and others)
- Total Organic Carbon
- ^{137}Cs, ^{210}Pb (age dating)





USGS sediment sampling locations on the Similkameen River above Enloe Dam (October 15 - December 14, 2019)

Explanation

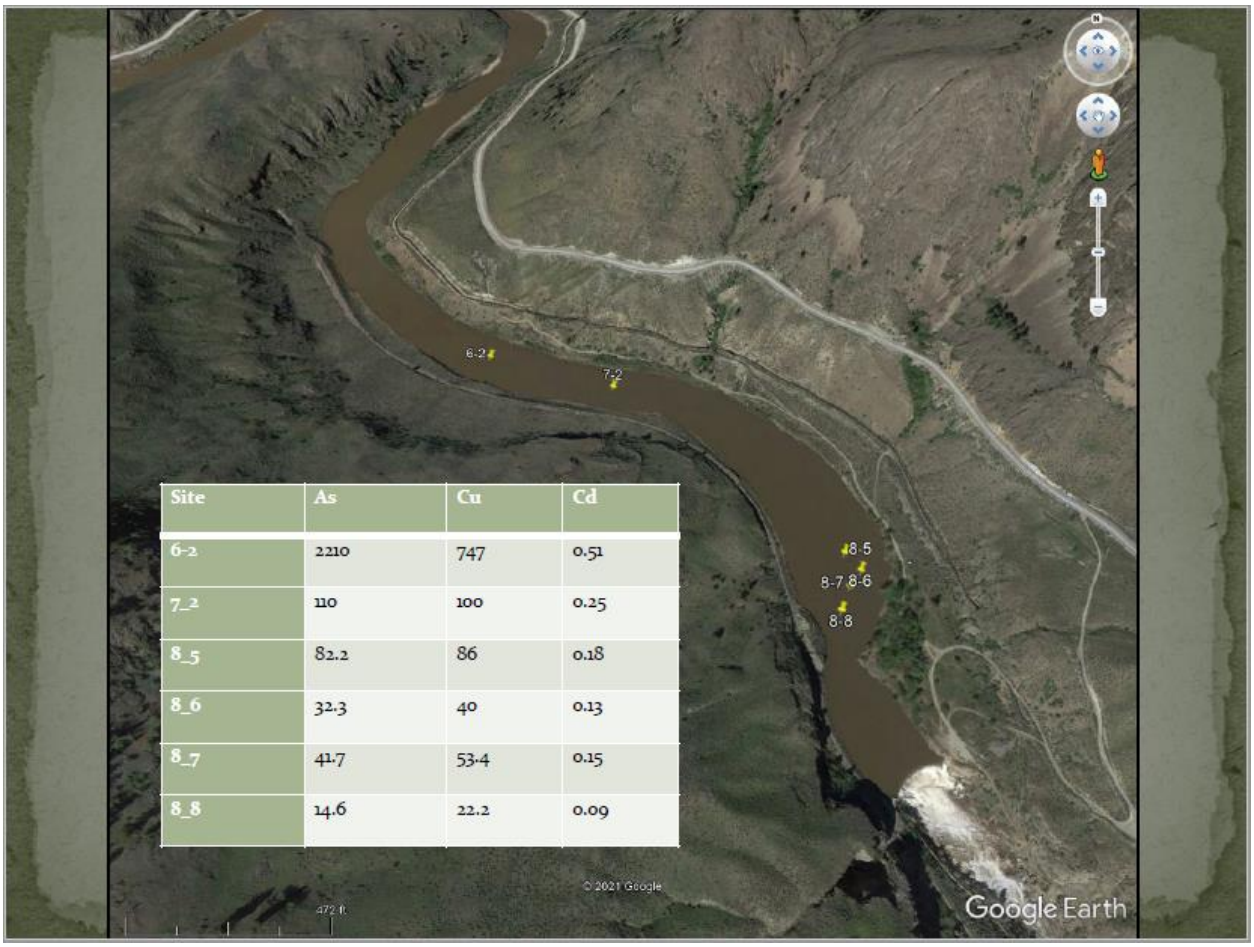
- Dec. Coring Locations
- Nov. Coring Locations
- Oct. Coring Locations
- PONAR Bed Grab Locations
- 7 Transect Number

Sediment Quality – Recent Data

Preliminary data of potentially hazardous elemental concentration in Enloe sediments:

Study ID and Date	Number of samples	Arsenic (ppm)		Cadmium (ppm)		Copper (ppm)		Mercury (ppm)		Lead (ppm)		Zinc (ppm)	
		Median	Max	Median	Max	Median	Max	Median	Max	Median	Max	Median	Max
Surface bull	9	10.1	12.8	0.23	0.28	20	21.4	0.02	0.06	8	9	37	39.3
Surface <63	27	29.2	38.7	0.48	0.79	57.1	69	0.05	0.07	12.2	15.2	70.1	77.9
Cores bulk	30	33.5	2210	0.135	0.52	37.9	747	0.01	0.17	7.65	14.3	51	112
Cores <63	20	279	3940	0.51	1.12	168	1010	0.025	0.15	13.4	28.3	112	137
	indicates exceeds TEC												
EPA/Kabba-Texas		9.8	14	19	68	472	1300	<.1	0.08	3420	13000	2320	7820

Sediment Quality Guideline: Threshold Effects Concentration (TEC)& Probable Effects concentraion(PEC)						
TEC/Hurst	9.79	0.99	31.6	0.18	35.9	121
PEC/Hurst	33	4.08	149	1.06	128	459



Site	As	Cu	Cd
6-2	2210	747	0.51
7_2	110	100	0.25
8_5	82.2	86	0.18
8_6	32.3	40	0.13
8_7	41.7	53.4	0.15
8_8	14.6	22.2	0.09

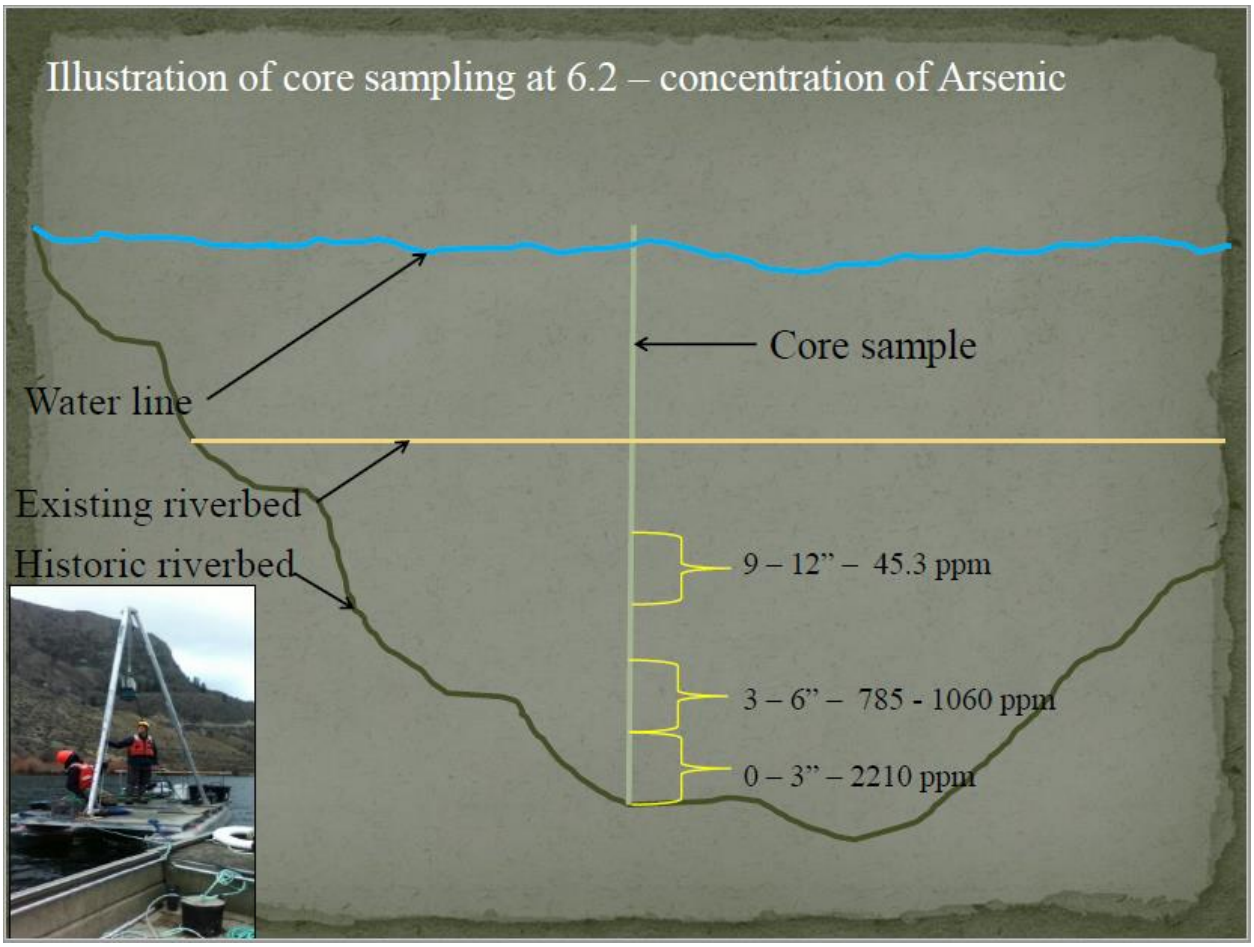


Illustration of core sampling at 6.2 – concentration of Arsenic
Core sample
Water line
Existing riverbed
Historic riverbed
9 – 12" – 45.3 ppm
3 – 6" – 785 - 1060 ppm
0 – 3" – 2210 ppm

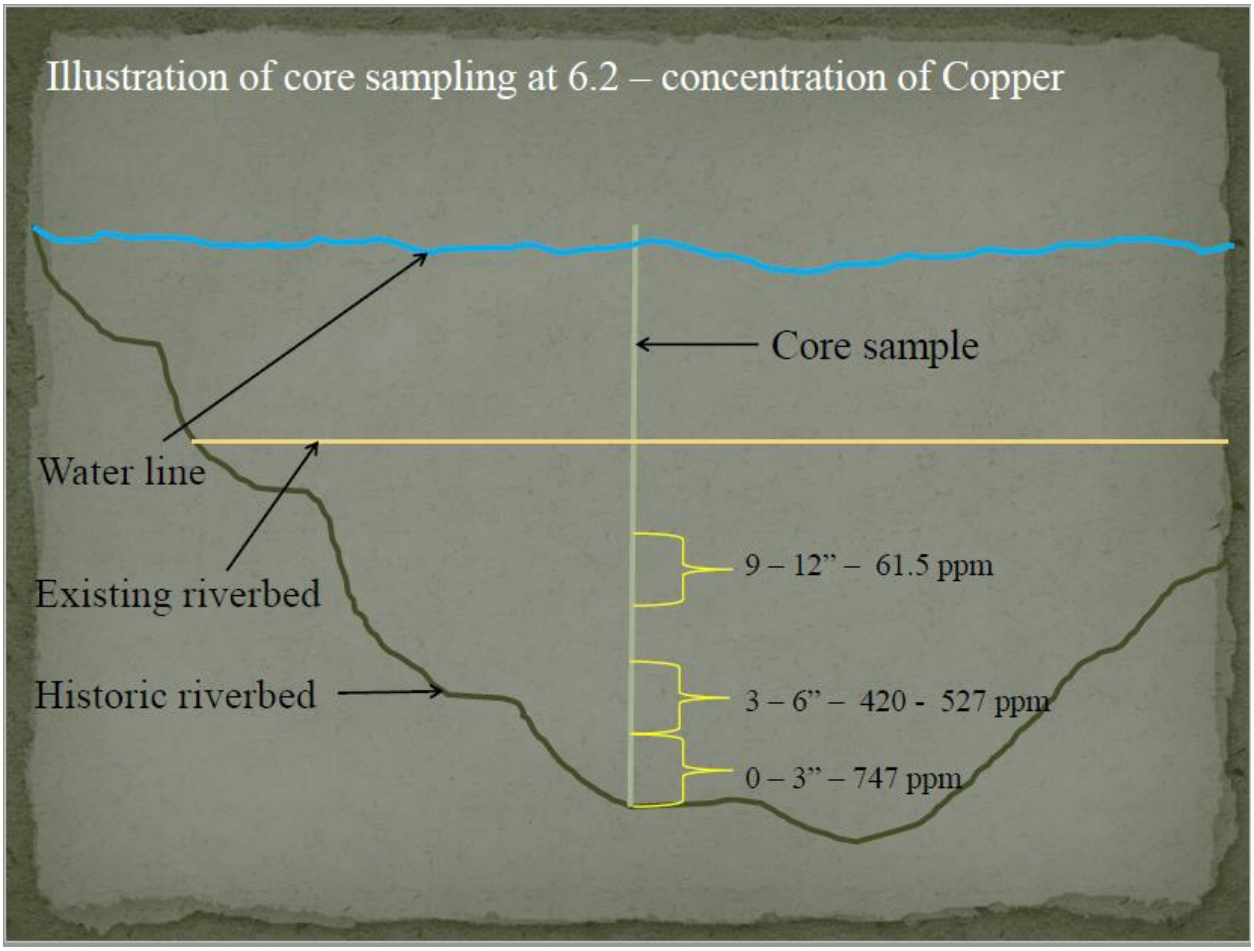


Illustration of core sampling at 6.2 – concentration of Copper
Core sample
Water line
Existing riverbed
Historic riverbed
9 – 12" – 61.5 ppm
3 – 6" – 420 - 527 ppm
0 – 3" – 747 ppm

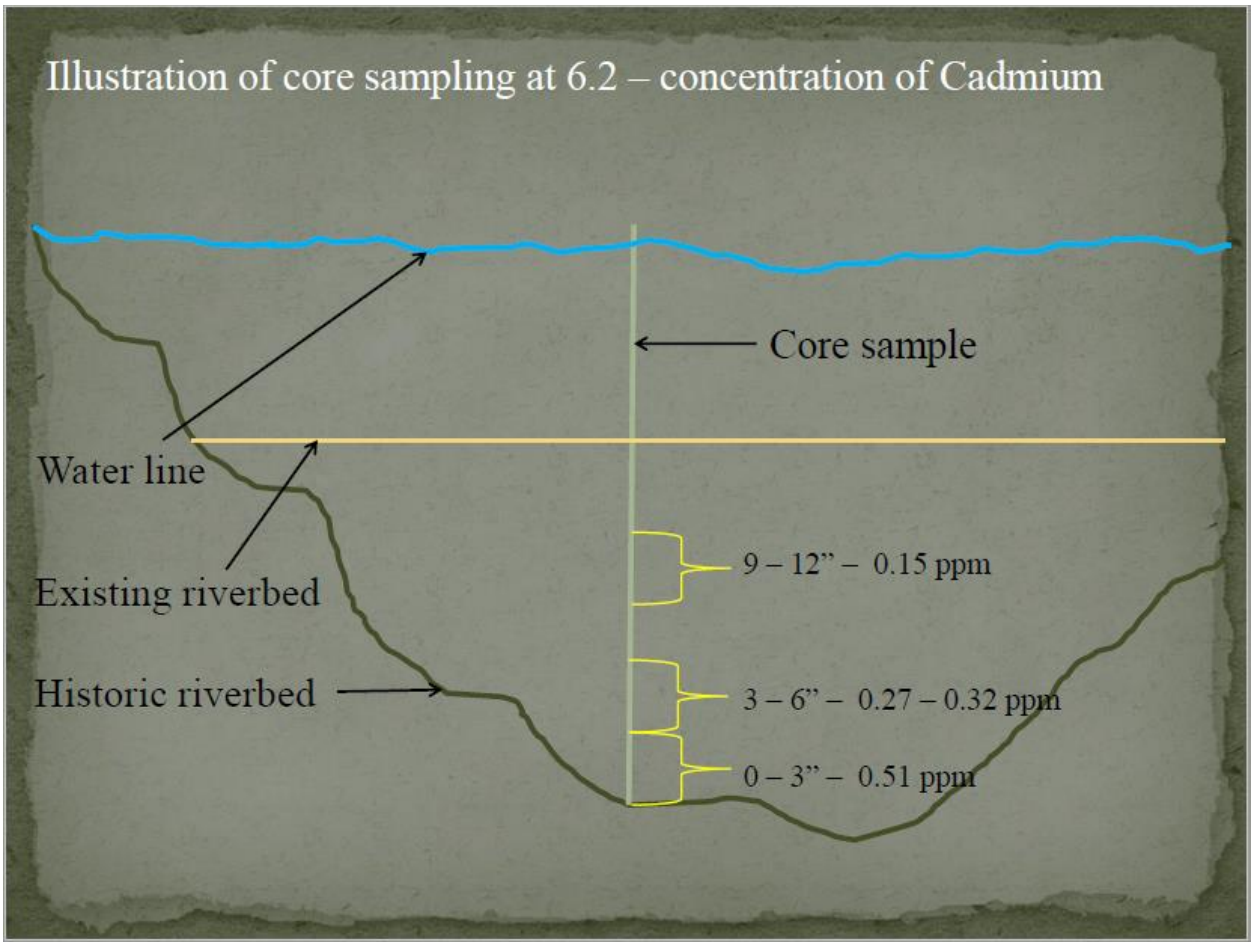


Illustration of core sampling at 6.2 – concentration of Cadmium
Core sample
Water line
Existing riverbed
Historic riverbed
9 – 12” – 0.15 ppm
3 – 6” – 0.27 – 0.32 ppm
0 – 3” – 0.51 ppm


Additional Sediment Sampling – Funded by Dept. of Ecology
4/13/2022
SED-RC-2.0-02

Upstream Tasks

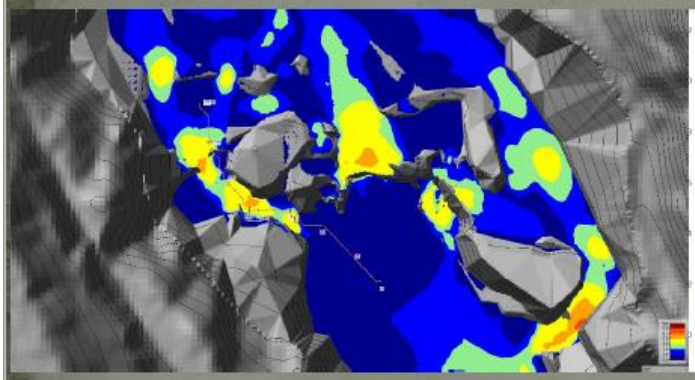
- What did they do?
  - Sub-bottom Profile: It was determined that USGS Sub-bottom profile did not need supplemental sampling.
    - Why is this important? To help determine the amount of sediment that is impounded behind the dam.
  - Core Samples: Ecology wanted to supplement previous core sample work with additional samples to help characterize the sediment at depth
    - Why is this important? Depth sampling is important because historical contamination can be found at depth (behind the dam sediment is continually deposited)
  - Leaching Analysis of Sediment Material: A leaching analysis allows us to estimate the contaminant binding ability to the sediment.
    - Why is this important? A leaching analysis is important for future decisions regarding dredging and disposal.

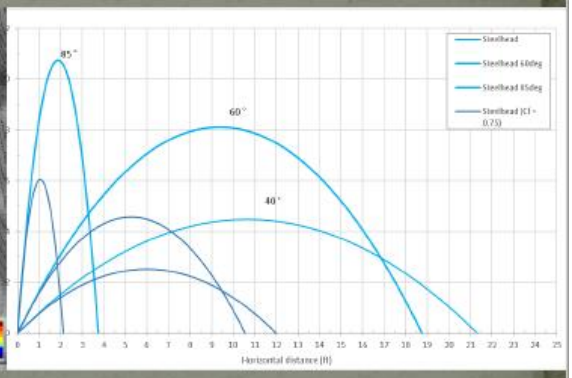

Navigability of Coyote Falls - October 12, 2021 (525 cfs)

Steelhead and Chinook Fish Passage at Similkameen Falls

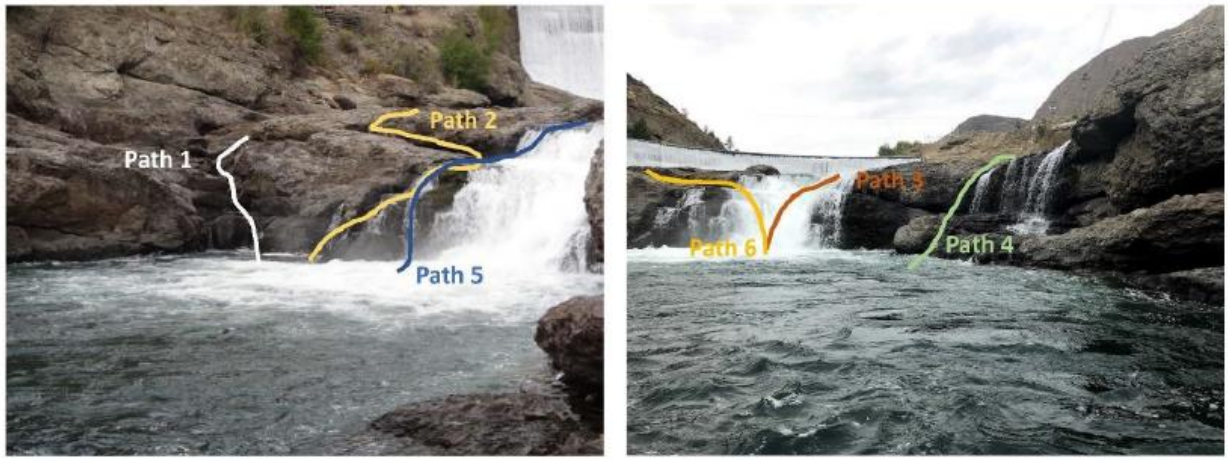
1. **Annual Flow Statistics** during Steelhead and Chinook run timing used for Hydraulic model.
2. **Hydraulic Conditions** at Similkameen Falls when Steelhead and Chinook are present.
3. **Steelhead and Chinook** average swim and jumping ability.
4. **Hydraulic pathways at Similkameen Falls** within the athletic ability of steelhead and chinook at each modelled flow.

- Combined Hydraulic model and swim data.
- GIS software routine least cost analysis.
- Produced viable pathways at modelled flows.
- Each path was checked to confirm using model data.





Six hydraulic pathways that open and close to steelhead and chinook at various flows.



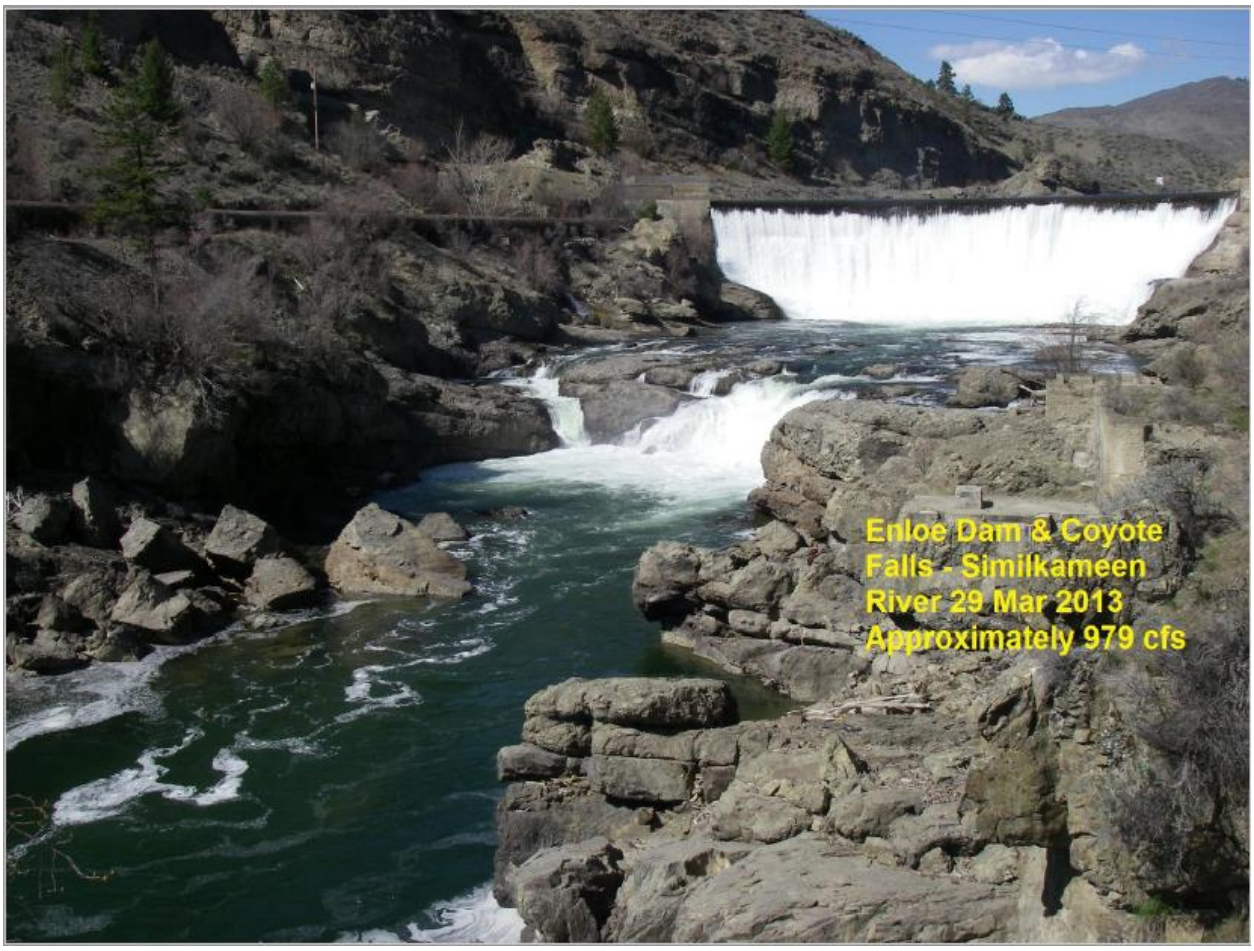
Results

Steelhead

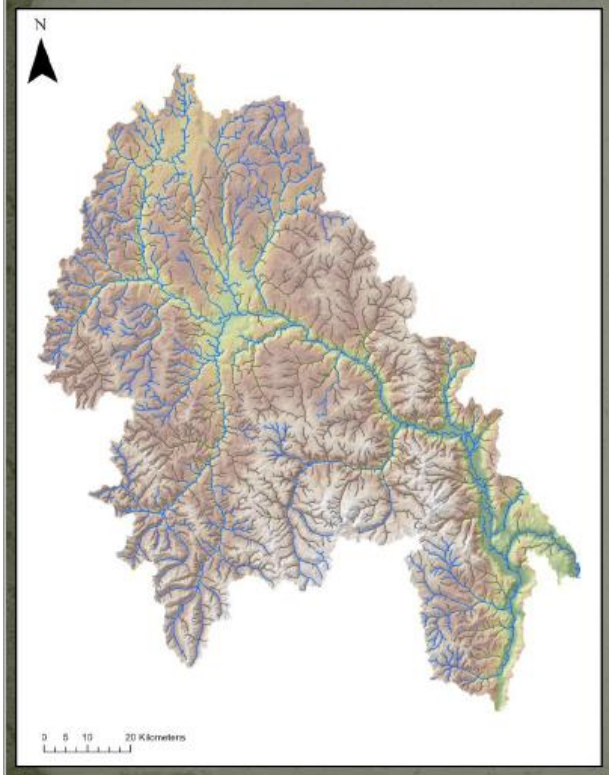
	Relative Fish Passage Difficulty along Viable Modeled Fish Passage Paths- Adult Steelhead								
Path	270 cfs	500 cfs	1000 cfs	2,100 cfs	3,000 cfs	5,000 cfs	7,000 cfs	12,000 cfs	17,000 cfs
1	-	-	Less Difficult	Less Difficult	Moderate	Moderate	Moderate	More Difficult	More Difficult
2	-	-	-	-	Moderate	Moderate	Moderate	Moderate	More Difficult
3	-	-	-	-	Moderate	Moderate	Moderate	Moderate	More Difficult
4	-	-	-	-	-	-	Less Difficult	Less Difficult	Moderate
5	-	-	-	Moderate	Moderate	Moderate	Moderate	Moderate	More Difficult
6	-	-	-	-	-	Moderate	Moderate	Moderate	More Difficult

Chinook

	Relative Fish Passage Difficulty along Viable Modeled Fish Passage Paths- Adult Chinook								
Path	270 cfs	500 cfs	1000 cfs	2,100 cfs	3,000 cfs	5,000 cfs	7,000 cfs	12,000 cfs	17,000 cfs
1	-	-	Moderate	Moderate	Moderate	-	-	-	-
2	-	-	-	-	Moderate	Moderate	Moderate	Moderate	More Difficult
3	-	-	-	-	Moderate	Moderate	More Difficult	More Difficult	More Difficult
4	-	-	-	-	-	-	Moderate	Moderate	Moderate
5	-	-	-	Moderate	Moderate	Moderate	Less Difficult	Moderate	Moderate
6	-	-	-	-	-	Moderate	Moderate	Moderate	More Difficult


Enloe Dam & Coyote
Falls - Similkameen
River 29 Mar 2013
Approximately 979 cfs

Habitat Assessment



Anadromous extent

- Known barriers
- Ground surveys (Upper and Lower Similkameen Bands)
- Stream slope
- Result: 2446 km accessible (of 5504 km)

Modeling capacity

- How much habitat is there?
  - Parr:
    - Small streams (<20m bankfull width)- Pools, riffles
    - Large streams – bank and bar edge
  - Spawners:
    - Pool tail area
- How many fish would we expect at full seeding?
  - Parr - Literature, report fish densities (Skagit R., etc.)
  - Spawners – Redd area

Streams surveyed - 62

- Streams NOT surveyed dry at confluence
- Natural barriers aligned with LiDAR/DEM
- 19 streams listed with barrier, 9 are log jams
- Spawning habitat: substrate, depth and velocity
- Large wood – 39 sites

Modified criteria –

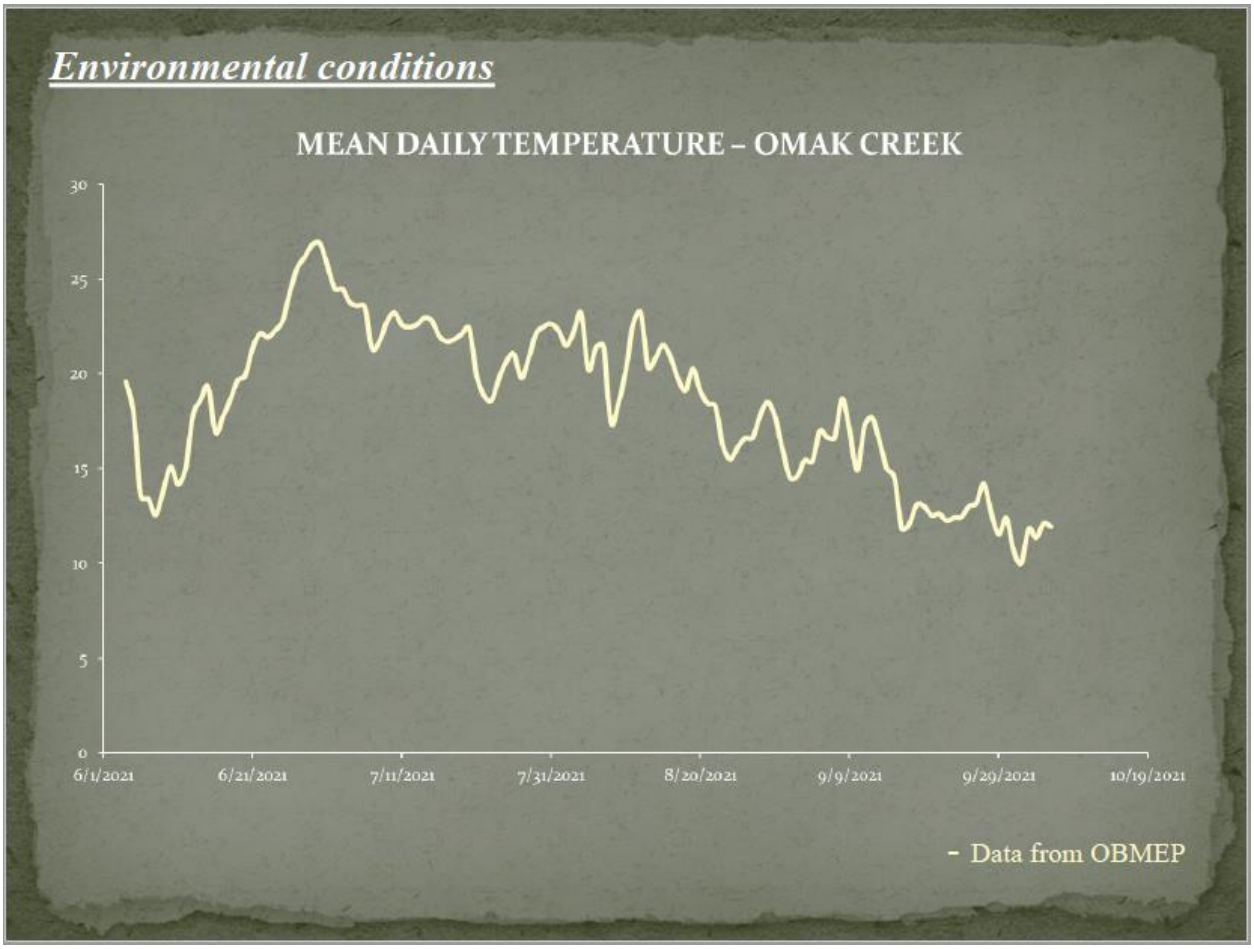
- *Reconsider confluence*
- *Pools – spawning habitat*
- *Calibration for Large wood*

Some context: At parr capacity....

- Chinook: 3.9 million parr ⇨ 7800 - 47,000 adults
- Steelhead: 9.8 million parr ⇨ 29,000 – 118,000 adults

Natural-origin adult steelhead return to Okanogan River

2019	2020	2021	2022
167	271	117	87


Environmental conditions
MEAN DAILY TEMPERATURE – OMAK CREEK
30
25
20
15
10
5
0
6/1/2021
6/21/2021
7/11/2021
7/31/2021
8/20/2021
9/9/2021
9/29/2021
10/19/2021
- Data from OBMEP

Steelhead population estimate in Omak Creek - (Mission Falls to confluence)

	2014	2015	2016	2017	2018	2019	2020	2021	2014-2020 avg	2021 prop of historical avg
Omak Cr (Lower), Age 1+	7581	4488	7252	7264	3101	4,163	5,284	224	5590.429	0.0401
Omak Cr (Lower), Age 0	29136	27671	29243	4064	9360	19,717	10,818	921	18572.71	0.0496

- Data from OBMEP

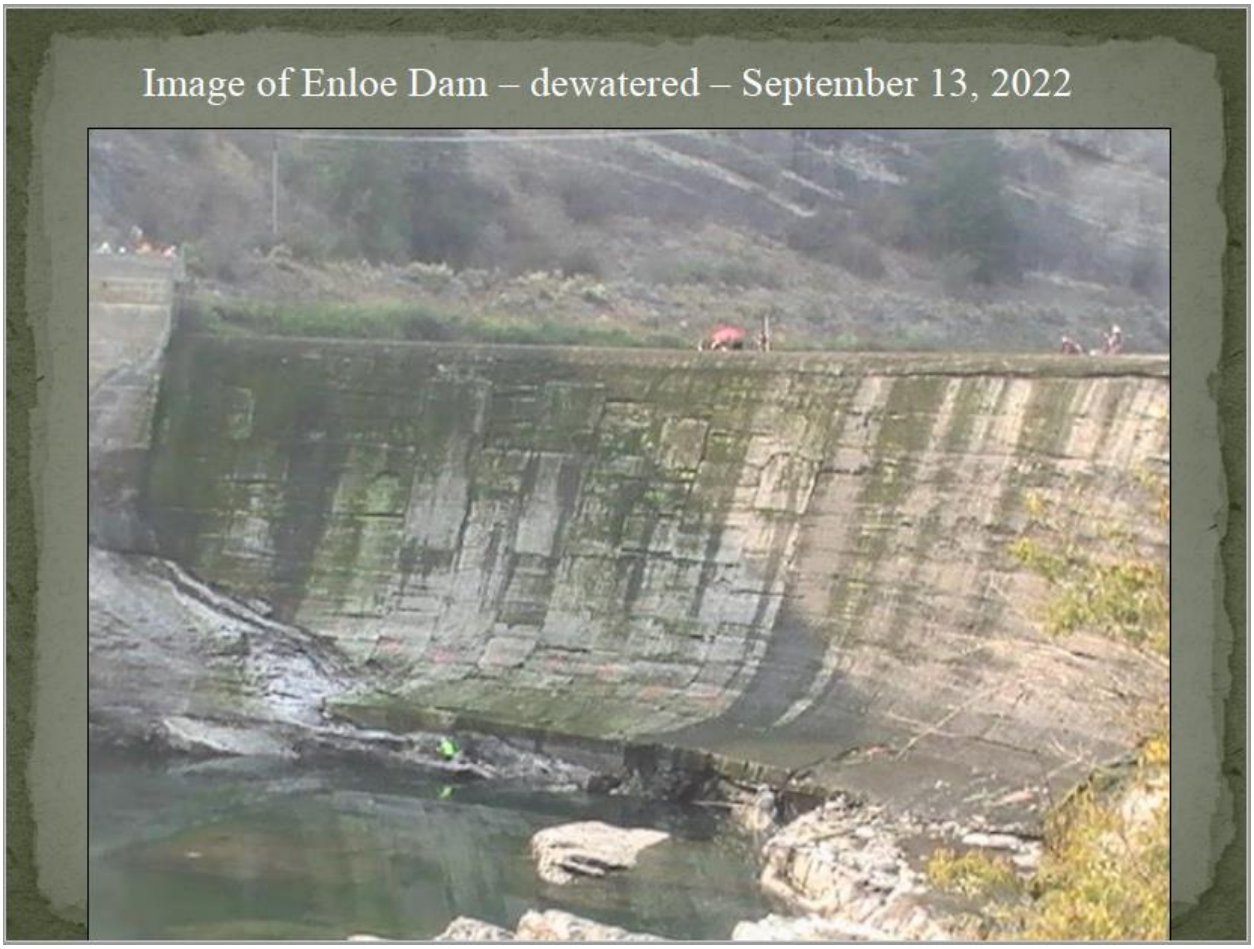


Image of Enloe Dam – dewatered – September 13, 2022

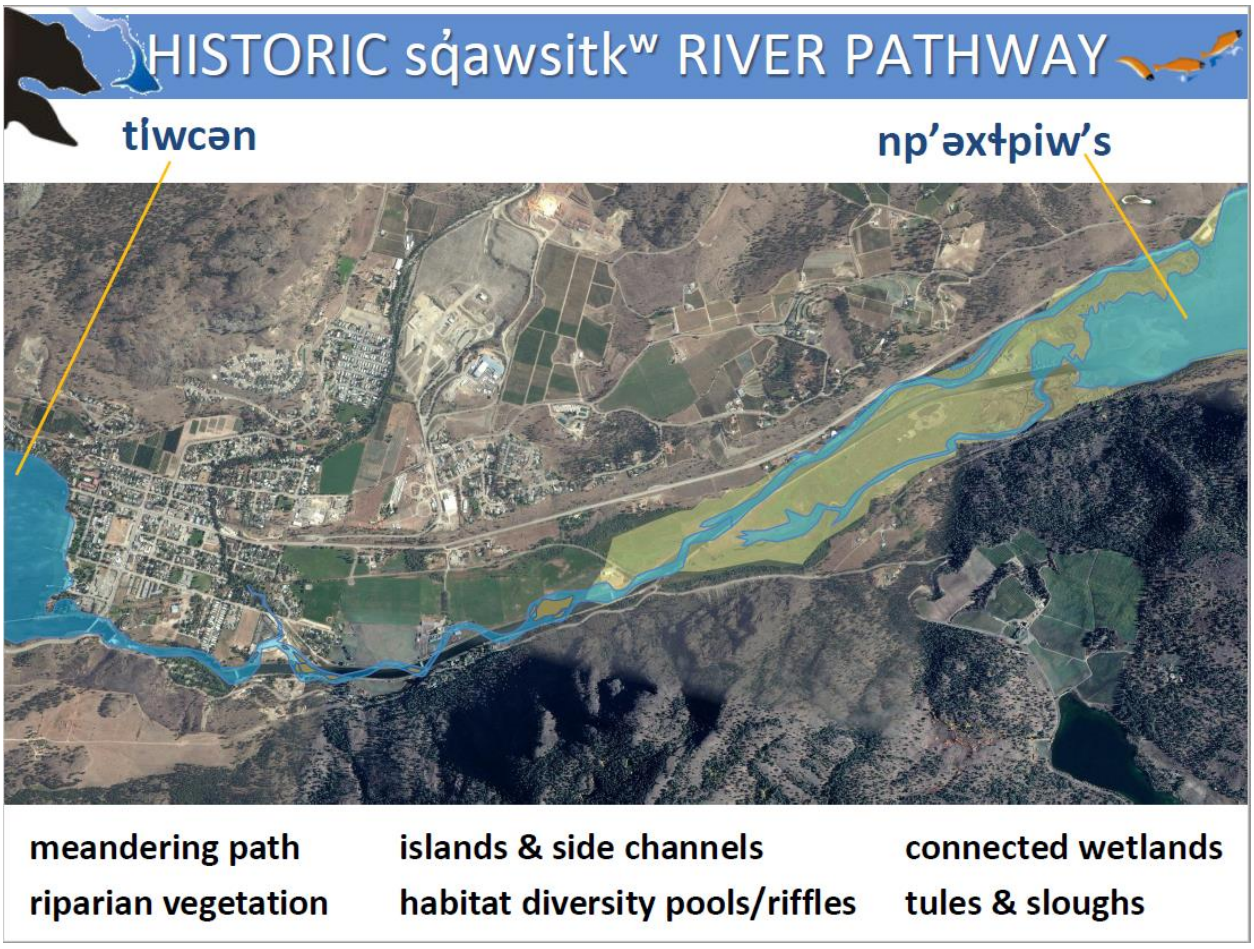

Enloe Dam Impoundment at drawdown – September 13, 2022

Summary:

- Initial sediment sampling, elevated levels of As, Cu, Cr, isolated
- Additional sediment sampling – characterize impoundment and background - interpretive report (draft) December 2022.
- Falls navigability – successful for both steelhead and spring Chinook
- Habitat – capacity, millions of parr* – refined estimates winter 2022
- Okanogan PUD – Dam Safety Inspection – Sept. 2022 – report 2023
- Proviso of 250K to consider ownership – accept liability
- Next step, pending funding, feasibility study - 30% design to deconstruct

Attachment 2

Presentation by Chris Fisher on Okanagan Falls Floodplain Reconnection Project on the Okanagan River

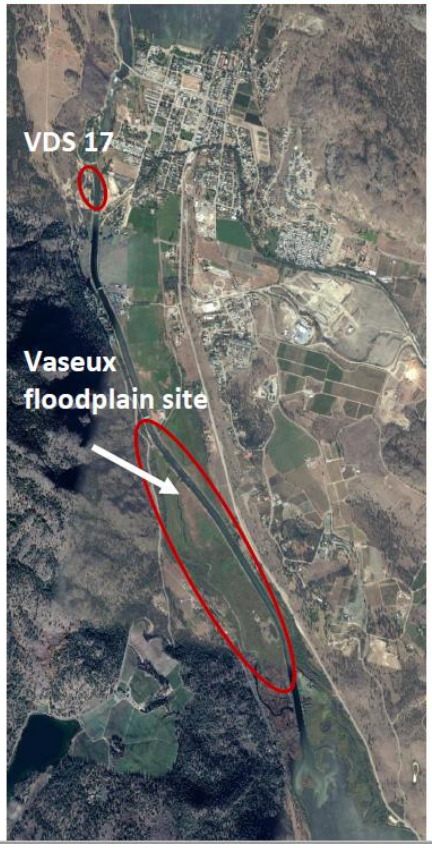



The river now
tl̓wcən
np’əxɬpiw’s
sx̌ʷəx̌ʷnikʷ

Existing conditions

BACKGROUND

- One of the next largest opportunities is the re-engaging the floodplain in the NW marsh unit of the Vaseux-Bighorn National Wildlife Area (between VDS 14 and Vaseux Lake).



ADD RIFFLE

Add a riffle at 33+046 (the shallowest part)
Add 1 or 2 culverts