CUMULATIVE THREATS, COLLABORATIVE SOLUTIONS: SHAPING SALMON AND WATERSHED FUTURES

Knowledge Exchange Workshop June 16th, 2026 ~ 9:00am – 3:30pm PST

Workshop Summary Report

Introduction

Co-hosts *Laura Weatherly, Fisheries and Oceans Canada (DFO); Jason Hwang, Pacific Salmon Foundation (PSF); Greer Maier, Washington Governor's Salmon Recovery Office (GSRO)*

Laura welcomed participants, noting this workshop, 12th in the Restoration Knowledge Exchange series, was hosted in collaboration with Simon Fraser University and the Watershed Futures Initiative, which supports research on cumulative effects in British Columbia's salmon-bearing watersheds.

Over 1,000 participants from around the world were taking part in this virtual workshop, representing governments, consultants, indigenous groups, non-governmental organizations and academia.

Jason reviewed the day's agenda, invited participants to use the Slido interactive tool, and reminded everyone of PSF's 2-day BC Salmon Recovery & Resilience Conference in October.

Greer added that today's topic gets to the core of what it will take to support watershed recovery and build resilience.

Cumulative Impacts as a Wicked Problem

Jonathan Moore, Simon Fraser University (SFU)

Highlights from this presentation included (See PPT for more details):

- Today's initial presentations feature work under the Watershed Futures Initiative.
- Like a many-layered onion, cumulative threats presents a complex, multi-layered challenge.
- Jon invited Slido input on the different human activities threatening salmon in participants' own local systems, and what part of the ecosystem/habitat was being affected.
    - Participant responses reflected in a "word cloud" showed the large range of human activities involved — which highlights the importance of a focus on people and the things we do that impact salmon.
- Cumulative threats involve vast scales of connections and vast scales of risk.
    - The resulting challenge for salmon is like death by a thousand cuts.
- Threats can be grouped into two categories: climate change-related and local activities.
- Some systems are thriving, some are doing okay and some are being driven towards impoverishment.

- Warning signs include spawner decreases seen in 70% of assessed stocks, commercial harvest declines of 70% in the last 40 years, and indigenous harvests that have declined by over 80% over the last 50-70 years.

- "Pathways of effects" provides a model for breaking down and understanding how human activities create stressors, which change habitat conditions, causing harm to salmon.
    - In BC, for example, widespread forestry leads to removal of riparian vegetation, which leads to warmer waters, which can harm salmon.
    - The effects on salmon are not just from a single stressor. More often, it's from a complex interplay of factors, from multiple activities and pathways, with climate change adding an additional layer.
- All this inspired the Watershed Futures Initiative, a collaboration between SFU's Salmon Watersheds Lab and the University of British Columbia's Conservation Decisions Lab, with the goal of improving the state of knowledge and effective management of cumulative effects.
    - The work encompasses examination of environmental justice and equity questions, mapping of spatial patterns and pressures, technical assessment of risks and harms, potential recovery actions, policies and values (how do people balance salmon, nature and other priorities).
    - The end goal is to help identify what are the positive paths forward for people and salmon.

Values, Justice and Salmon

Sara Cannon, UBC Centre for Indigenous Fisheries and Nigel Sainsbury SFU Salmon Watersheds Lab

Presentation highlights (See PPT for more details):

- Sara began by explaining why concepts of equity and justice belong in salmon conversations today.
    - The cumulative effects threatening salmon today emerge from colonial systems that focus on resource extraction. The largest resulting costs are borne by indigenous people who were not responsible and did not benefit from that paradigm.
    - The threats are thus not just ecological, and the cumulative effects framework was extended to include a cumulative injustices frameworks examining the many layers, harms and compounded effects.
    - This approach brings in the social and cultural threats, including inter-generational harm.
- The Yukon River as an example of colonial injustices: Chinook have been declining for decades due to multiple effects, including climate change, competition at sea from hatchery fish, commercial fishing, mines and dams built without consultation.

    - The result is empty freezers, no more fish camps, and cessation of traditional activities essential to preserving and transmitting indigenous knowledge to future generations.
- Nigel continued with a series of images developed in collaboration with the Nuu chah nulth people, and rooted in their world view that everything is connected:
    - Their relationship with land, water and animals is not based on resource extraction.
    - Colonial values based on greed causes harm to salmon and their habitat.
    - Connections are highlighted between ecological decline and impact to communities, including loss of identity, cultural practices, livelihoods and health outcomes.
- Addressing this through transformative justice, the key dimensions of which include:
    - Acknowledgement of the structures of cumulative injustice.
    - Recognition of indigenous sovereignty and authority.
    - Co-management through place-based shared governance.
    - Restitution and accountability.
    - Fair distribution of impacts and benefits.
    - Weaving together western science and indigenous knowledge.
- Regardless of how you work with salmon, this can be a tool for restoring equity, with many examples emerging now of First Nations leading salmon recovery on their own terms.

Spatial Patterns in Cumulative Impacts

Spencer Dakin Kuiper, SFU Salmon Watersheds Lab

Presentation highlights (See PPT for more details):

- Cumulative impacts are a “wicked problem.” They are also inherently a spatial problem.
- Mapping the individual effects of urban development, forestry, mining, etc. shows hotspots for each threat but you lose a lot of detail when you try to overlay them all.
- We know that salmon experience multiple pressures simultaneously and that these effects vary geographically. This research sought to identify if distinct patterns of overlapping pressures occur repeatedly across landscapes and how they affect salmon.
    - Looked at different areas and pressure indicators (e.g. forestry, road building, mining, climate change, watershed characteristics (17 variables in all).
    - Used K-means clustering algorithm to group watersheds based on shared values.
- Results: Identified 8 distinct cumulative effects pressure archetypes, such as:
    - Mountainous: high elevation, small streams; winter snow shifting to rain changes peak flows, timing.
    - Mining interior: bigger rivers, more pressures.
    - Urban: straighter, more confined rivers, lots of impervious surfaces, lack of bank-side vegetation.

- Distribution: these archetype patterns, which don't follow traditional watershed boundaries, were overlaid with spawning habitat distribution. Findings included:
    - Varying expose to pressure by species.
    - Chum, for example, mostly depend on low-elevation coastal streams, affected by land cover alternation and linear development, so focus on riparian protection.
    - River type Sockeye spawn more in headwaters, and are more impacted by climate change and forestry, so focus on climate change mitigation/adaptation and forestry practices.
- In short, these different pressure "bundles" suggest the need for different management responses.
- Summarizing, this work reflects a novel approach to distil the enormous complexity, reducing it to 8 archetypes.
    - It may be particularly useful for informing priorities in data-limited systems.
- If cumulative effects are clustered, solutions can be designed and clustered accordingly.

Synthesizing Pathways of Effect for Decision Making

Sam Wilson, SFU

Presentation highlights (See PPT for more details):

- Pacific salmon are amongst the most studied species globally, but much of the information is not accessible, so this is about compiling and synthesizing information to inform decision making and building tools to support practitioners and planners.
    - The latter includes building pathways of effect for activities relevant to salmon and developing stressor/response functions, including determining the shape of such functions.
- A key question is how to quantify the effects of stressors on salmon survival.
    - Did a systematic review of 29,504 papers on factors affecting freshwater survival and productivity for salmon. This was narrowed to 815 papers and led to development of 50 pathways of effects, 116 papers on stress response and development of 131 stress response functions.
- Pathways of effect: We tend to conceptualize these as linear but it actually looks more like webs. The approach offers a tool where you can look at what's most relevant to your case.
    - Example: Pathways of effect showing the various ways that forestry affects egg survival (direct and indirect linkages).
- Stressor responses functions:
    - The first curve shows survival not initially decreasing until you hit a particular threshold.
    - But it may instead be a linear relationship where every increase in the stressor leads to a decrease in survival. So important to know the correct shape of your function.

    - The analysis suggested that 75% of stressor response curves had a linear increase (only 8% had a threshold function).
- Key takeaways:
    - We can build PoEs with published research, but these will need to be augmented by other information sources, e.g. expert opinion.
    - Stressor response functions are mostly linear, meaning small ecosystem changes can impact salmon.
    - Together PoEs and stressor response functions can be used to identify cumulative stressors and the impacts on salmon.
- This work is in the pipeline for publication, and will be publicly available to support land use planning and recovery actions.

Panel Q&A

- Presenters were encouraged to address during the Q&A how practitioners can start to integrate these insights in their work.
- What role can non-Indigenous actors play to support First Nations without getting in the way?
    - The most important thing is to follow instead of attempting to lead. The work is already happening. The approaches may be outside our organizational practices so we can push for change. Ensure that consultation is not a checkbox exercise, Indigenous monitoring can be a key source for primary, not secondary, data. Be aware that the level of injustice accumulates as the result of a series of decisions.
    - Often it's about the spirit in which we work — e.g. concepts of ally-ship and listening to understand.
- How do you act when there is a compelling issue and indigenous partners are already overwhelmed without the capacity to address their many competing priorities?
    - It is a reality that people do have a lot going on. But communicating well, ensuring we don't have blinders on, or just checking in on whether it's ok to move this forward.
    - Also being prepared to not move forward if there is a clear signal.
- Were there any variables that weren't included in archetypes due to lack of data?
    - Adding a temporal aspect to this work would be very useful — we might see a more dynamic archetype/ process emerge. There may also be emerging/future stressors (pipelines, solar/wind farms).
- Q/A: Spencer used spawning habitat because it was an easy variable to study. Rearing habitat is more spread out and not as well mapped. The paper also looks at CU (salmon Conservation Unit) status vs. archetypes. A closer look at rearing habitat could be future work).
- Which is more effective, a wide-reaching or targeted cumulative effects approach?

    - There is no silver bullet, so we need to think about systems-level transformation and we've outlined different layers of research that can be applied to that kind of work. So asking questions like how much risk is acceptable, how to balance the benefits nd risks of industry and then identifying what specific actions to take, like removing culverts. This includes how to incorporate the different groups and their values
- In BC and Yukon, very few places have collaborative tables and plans have typically been developed outside, so is the idea that developing a plan together is the gateway to such collaboration?
    - A recovery plan is a key platform for having the conversations to identify what matters, and then to identify problems and solutions. There is the risk though of just planning and then not translating it into action. In Washington we see examples of regional planning that balances the needs of people, place and ecosystem.
    - The presenters are already seeing this work feeding into planning and action.
- Expand on adaptation of species to different stressors.
    - Pacific salmon have incredible tools to respond to change. That's why they survived for millennia, but change is coming faster than ever, so it's important to consider how we can protect that capacity to adapt directly. Different populations have different thermal tolerance, but when you lump them all together you lose that important detail. When you're diving into the weeds, you can start to split that out and ask those important questions about how the characteristics of different populations affect stressor response curves. When you're doing PoEs and stressor response curves, you are forced to ignore some of that diversity in order to harness the power of these large data sources. So for the Fraser Chinook 52s, there are no studies on how sediment affect these populations but we can use data from coastal forests to say that sediment will affect eggs, then dive deeper for those populations specifically.
- How can biologists working with indigenous communities prioritize data collection to identify and target stressors?
    - Prioritization must start with communities, so showing up early and asking them what they're seeing. That knowledge, plus community priorities, should shape what gets collected and then the biologists can help ensure data collection happens as needed.
    - Data sovereignty is also very important (OCAP principles), in part because of the historical pattern where data was collected but not shared. Knowledge is power, and in the past that data may have been used to push against rights holders. Who holds knowledge is linked to questions of equity.
    - That was demonstrated in what occurred in the Skeena estuary.
- How can a local manager manage their watershed effectively?
    - It's hard because we make it hard. It's easy to save salmon if we just get out of their way, but in reality it's a question of tradeoffs with the other things that we want to get out of the watershed. You need a land use planning process to identify what's important. Then you need to plan tradeoffs (there are few win-wins). We can over-

complexify this. Salmon need sufficient water, cold water and connected habitats. Remove culverts, don't take the water, connect habitats.

- We've focused on the relationship between salmon and their habitats, and not much on the effects of fisheries, hatchery production, invasive species and pathogens. Do these also fall within the big ideas being discussed?
    - It's all connected by the salmon lifecycle. Some things aren't controlled by the local people, such as ocean temperatures or fishing. So how can you ensure the work you do is not overwhelmed by these other factors, as these things do all add up. As we talk of local agency in this time of cumulative effects and climate change, salmon may need more space to survive these additional pressures that are outside our control.

Public Preferences for Salmon Watershed Stewardship

Nigel Sainsbury, SFU

Presentation highlights (See PPT for more details):

- Stewardship decisions affect the lives of people too. And public support matters to the success of stewardship initiatives.
- Presentation shares results of a survey asking a representative sample of the BC population to weigh tradeoffs involved in salmon watershed stewardship.
    - The survey asked about preferences on logging riparian buffers, new land use prohibitions, salmon population status/targets and increased Provincial income taxes to fund restoration.
- BC residents are willing to pay more tax to permit the BC government to raise $615 million to increase salmon abundance in depressed populations from 25% to 75% of a healthy baseline, and they value healthy salmon much more than impoverished populations.
    - BC residents are willing to pay more to support healthier populations and they value healthy populations exponentially more than depleted populations.
- Survey also identified distinct demographic groups with different values and mapped the strength of support/opposition to different questions amongst those groups.
    - The largest group (55%) wants more salmon and most strongly supports new mining prohibitions.
    - A second group (33%) strongly opposes new mining prohibitions.
    - A third group most strongly supports salmon but not new prohibitions ("wants to have cake and eat it" mindset).
- If we seek enduring watershed futures, it's important to understand and manage for public priorities.
- Study results to be shared shortly.

Policy for Healthy Habitats

Marta Ulaski, SFU Earth to Ocean Research Group

Presentation highlights (See PPT for more details):

- Salmon are impacted by human activities through pathways of effects as discussed earlier.
    - They are also affected by policy pathways — laws, policies, regulations, planning and practices, which influence human activities, stressors and habitat.
- Understanding policy pathways: these are complex, ranging from local to international treaties.
    - Many also happen in their own silos — i.e. individual laws, etc don't consider how they interact or combine with others to create cumulative effects.
    - Examples of the many policies at various government levels, in marine and freshwater, that target specific issues or activities.
- Study of policies showed very limited positive content, most of which is outweighed by negative content, relating to cumulative effects.
    - Most positive elements (up to 70%) are also discretionary, not prescriptive (the most prescriptive being 30% in the Water Sustainability Act).
- Salmon systems are complex and the effects of human activity on them are often hard to predict.
    - Project level assessment is not effective, because cumulative effects are happening at the landscape level.
    - No enforceable limits on cumulative harm.
    - Decisions are isolated from the people and places most impacted by them.
    - The effects of all this are amplified by climate change.
- Regional processes can enable multiple opportunities;
    - Collaborative, on the ground monitoring.
    - Regional cumulative effects assessment.
    - Legal limits through spatial planning — rarely used, limits need to be socially negotiated.
    - Co-governance and indigenous-led approaches.
    - Climate adapted cumulative effects management.
- Challenges differ at the regional levels and it's often more effective to address them at that regional scale
- Pathways towards holistic cumulative effects policy : later talks will illustrate how to do this.

Action for Salmon Recovery

Riley Finn, UBC Watershed Futures Initiative

Presentation highlights (See PPT for more details):

- Presentation focus is on exploring possibilities for management actions.
- Decision analysis: Understanding cumulative effects is part of problem definition.
    - What options are available? A robust list of alternatives can improve decision making.
- Recovery plans and strategy development can be initiated through different mechanisms:
    - Endangered Species and Fisheries legislation; government/NGOs developing their own strategies and action plans.
    - What is in these plans? Can we share ideas and strategies across different watersheds to help identify actions that can be taken at different scales.
- Mapping actions to pathways of effects:
    - Example of Forestry, to address forest coverage loss leading to increased water temperatures and migration mortality.
        - Options include addressing the problem at different levels (from systemic to bandaids/treating outcomes).
        - Consider the potential range, from enabling policies to direct action..
- Study reviewed synthesized and categorized existing actions: grouping 618 discrete actions into 124 generalized actions and 11 strategies.
    - Analysis included documenting the frequency of these 11 strategies being used and what action types they each involved.
        - Results were almost evenly split between enabling and direct action.
    - Closer look at the most common strategies showed communication and relationships are fundamental and require dedicated funding.
- Solution space: mapping potential strategies across two axes (topical to systemic, and direct to indirect.
- Key points: Intent of this work is to create a toolbox for salmon watersheds, with potential strategies characterized using the Pathways of Effects framework.
    - Key lesson about engagement and collaboration as key to systemic change, with strategies to increase collaborative capacity as the most frequent action across all plans.
- Paper is in development, expect publication in ~6 months.

Shared Watershed Pathways in a Time of Cumulative Impacts

Jonathan Moore, SFU

Presentation highlights (See PPT for more details):

- To find positive paths forward for people and salmon, this work is attempting to peel the layered onion of cumulative effects, and to better understand it as a wicked problem that spans time, place, realms, etc. To recap what's been shared so far:
    - Sara and Nigel discussed equity dimensions and salmon as a vehicle to achieve transformative justice.
    - Spencer is looking at cumulative effects as a spatial problem. Mapping shows the impacts aren't random, but clustered. This means there are similar problems and solutions.
    - Sam and Marta describe the complexity of pathways of effects; with stressor response functions that are curves more than cliffs; and also the need need to work within socially acceptable spaces for risk and harm.
    - Nigel also showed there is widespread public support for salmon and riparian protections and for thriving salmon populations, though we need to understand and work with different societal values.
    - Marta's policy work shows how silo approaches miss the cumulative impacts, with salmon falling through these jurisdictional policy cracks, and also the value of regional land use plans with teeth.
    - Riley examined what people are already doing to help recover salmon, showing there is a big range (toolbox) to aid recovery, from direct to strategic action and from habitat mitigations to governance shifts.
- The next step is sharing this work, for example at the International Indigenous Salmon Peoples Gathering Gathering, PSFs' Salmon Recovery & Resilience Conference and other gatherings.
- We also need to look at difficult scenarios of what the future may bring, including scenarios involving restoration as well as some industry, and what are the steps towards those.
    - Shared watershed pathways: The goal is to envision and empower sustainable and climate resilient paths forward for BC's watersheds, their salmon and people.
    - These paths are controlled in part by the local actions that people are taking, but also by future implications of how we respond globally to climate change.
    - These future scenarios and whether they are good or bad for salmon depend on our values, and on whether the future is characterized by low or high emission scenarios.
- Narratives articulating potential futures:
    - Extractive control: industry/government work to impose extractive values on communities, either by force or control of media narratives.
    - Working together: Local people work together to decide how they want their watershed to work, including decisions on their economic bases and tradeoffs.
- 3-step process for using this conceptual approach for planning:
    - 1. Envision pathways and explore alternatives to understand what are the outcomes of each for people, fish and climate resilience.
    - 2. Stepping stones: identify policies, actions and processes to advance the vision.

    - 3. Broad and strategic connection, communications and engagement.
- We're asking a lot of salmon and their habitat, and while they are resilient, with climate change they may not be able to take as much stress.
    - We need hard conversations to understand the hard decisions needed. Our work won't solve the problem but it can may help the work required.

Q&A Panel 2

- Were the BC residents' survey responses broken down by region? Values are often linked to livelihoods.
    - The survey collected demographic info to ensure it was geographically representative and to permit further analysis. So most respondents are from the Lower Mainland but the results showed regional differences in support for things like mining, buffers, agriculture and urban expansion prohibitions.
- How is this work being received by the Province, particularly with respect to DRIPA and implementation of UNDRIP?
    - It's been very good to work with the Province, in terms of what policy elements can address cumulative threats. But the Province is a big engine with many different parts. Marta's work highlighted the structural challenge of jurisdictional silos, so there is the challenge of linking the right research to the right partner. There is a Provincial cumulative threats assessment group. A critique is that it's not legally enforceable, but it's a good place to start these considerations. The Blueberry River Indian Band court case has been a pivotal tool in requiring the Province to consider cumulative effects and to set hard thresholds for that region. DRIPA identified it as critical to have effective policy/management of cumulative effects, but current Provincial policies are not doing a good job of that so a lot of work is still needed.
    - Progress on these things is typically not linear.
- How do you get to the enabling conditions? How can communities leverage what they have to build capacity, funding and motivation to have these bigger conversations?
    - An initial step is to explore what do we have to do, versus what are we currently doing. You need the broader recognition by all parties to set those enabling conditions.
    - The survey results were very positive, but when you look more broadly at what actually motivates pro-environment behaviour, it's very complex. It's our most deeply held values that drive human behaviour and those are very hard to change without a broader societal narrative.
    - Enabling conditions and questions about values are linked. How do people see themselves as part of the solution? There is often a false dichotomy pitting short-term economic gain against environmental solutions. We also need to highlight examples of the future, including what does it look like if we no longer have salmon in our streams. The goals is not just to restore salmon but to restore our relationships with salmon and how a place-based economy might look in that context.

    - We need to see pathways that blend degrees of protection with degrees of development to balance these things more thoughtfully.
    - There is also the idea of green infrastructure, though we haven't really built on it.
- On how effectively scientists communicate the results of their work, the public is more apt to believe information from sources they trust. How can we more effectively communicate what science says about what people can be doing better?
    - We know a lot about how to communicate more effectively, e.g the importance of using public champions whom the public trusts, and also more careful framing of public messages.
    - Conversations like this, that bring so many people together, are important. People believe information that supports what they already care about. If we get salmon right, we get a lot of the rest of it right. So it needs to be clear that more salmon means cleaner water, more fishing, less flood risk, cleaner air, more carbon storage and paint a picture showing the fuller value of healthy watersheds.
    - It's important to build relationships early in study design to build more trust.
        - — i.e. don't build anything for us without us.
- Re policies, effectiveness and intent at different scales, what factors affect success/failure?
    - Policy effectiveness is difficult to study because there are so many factors at play. Many studies look at implementation as a key bottleneck limiting the effectiveness of policies like the Wild Salmon Policy. Also important are legally enforceable provisions, although it's difficult to use these for cumulative effects because other effects may still continue. Also more proactive vs reactive policies, but it is hard to study the effectiveness of restoration with so many other impacts also happening.
- Did you look at how to use incentives instead of rules and consequences?
    - Voluntary-based incentives may be effective, but cumulative impacts challenge such approaches, as they may not be enough.
    - We're looking at whether the fisheries sensitive watershed designation is effective and it seems to be working. Salmon are amazingly responsive, so we need to look at how simple changes that are made on the land can make a real difference.
    - In-stream flows is a good example of where you can incentivize one landowner, but is it enough?
- In terms of the stepping stones, what are actions or steps we can take?
    - The stepping stones will look different in different places. The first step is engaging to learn from each other. There is also a need to engage politically and to take political actions locally. Also look for what are the local tables and opportunities to engage.

Lunch break: Slide deck featuring salmon initiatives (See PPT for details).

The Importance of Collaboration in the Yakima Basin and Other Regions

Urban Eberhart, Kittitas Reclamation District & Michael Garrity, WA Dept of Fish & Wildlife

Presentation highlights (See PPT for more details):

- Basin overview: The Yakima was once one of the most important ranges for salmon and steelhead in the Columbia system. It is highly reliant on orderly snow melt in the Washington Cascades,
- From conflict to collaboration: This was about coming together to plan how to protect the future economy while bringing back salmon and steelhead to sustainable and harvestable levels, despite an expected future of more severe and frequent droughts.
    - We started with conflict despite an abundance of water. 1977 was the first significant drought that led to arguments and litigation over water access.
    - Parties finally agreed to talk and to develop a common understanding of the facts instead of dehumanizing each other.
    - This led to the Yakima Bain Integrated Plan, a 30-year plan drafted by a coalition of Tribal, federal, state, local and non-profit partners and water managers to ensure water for farms, fish and communities. Cost is $4 Billion to implement the seven elements in three phases, including building new reservoirs to hold water which is now falling at rain instead of snow.
- Key partners were initially opposed to dams/water storage but bought into this as a more pragmatic and holistic approach.
- Challenges: Hydrologic changes are coming far more rapidly than expected, with more prolonged droughts, decreasing snowpack, and warmer waters. Other challenges include endangered and extirpated populations, and aging infrastructure.
- Goals include reliable water supply, restored fisheries, increased municipal water supply, drought and flood resilience and a robust regional economy.
- An important part of successful collaboration is having all the stakeholders, Tribes, government and other partners learning to speak each other's languages and adopting these shared goals.
- Accomplishments; 2013-26:
    - Conserved 74,000 acre-feet of water.
    - Removed ineffective Nelson dam and replaced it with a system that supports recreation and fish passage; also restoration, downstream fish passage and causeway removal.
    - Acquired Springwood Ranch reservoir site and 80,000 acres of river habitat.
- 2026 and beyond: Plans include ongoing floodplain restoration, groundwater storage projects, fish passage and restoration, modernizing Wapato irrigation, Springwood reservoir.
- Extensive list of partners.

- Columbia Basin wide collaborative efforts: expanding lessons from the Yakima to the rest of the Columbia.
- Columbia Basin Collaborative — Vision acknowledges the shared goals of all partners.
    - A consensus-based body committed to identifying and supporting integrated strategies and actions to restore salmon and steelhead. Respects Tribal and industry priorities, the importance of a future regional power system.
- Columbia Basin Restoration Initiative: The former creates broad support for pursuing low hanging fruit, while this initiative is looking at a comprehensive vision closer to the Yakima initiative. It is intended to avoid litigation, although current federal government is no longer cooperating.

Discussion

- How adaptable is this plan, given climate variability?
    - Key to the Yakima plan is its focus on a list of goals, not a list of projects, so it is designed to evolve in response to new information and changing conditions. We are constantly collecting information and adapting — e.g. more groundwater instead of surface water storage — so this is an evolving plan.
    - There will need to be further adaptation to address the pinchpoint in the mid-system, where migration conditions are challenging.
- What sort of data is important?
    - We start with the commitment to all of the elements and to moving forward together, but at the same time we're looking at where we can move forward now, celebrating our successes and moving on to the next one.
    - Also important is the group's willingness to seize opportunities to move things forward, even when such a focus favoured the other side.
- What strategies are used to address surface evaporation?
    - We are working on projects to address ASR, and also implementing water storage projects in the tributaries (to store and cool water there).
    - We're also investigating a deep basalt groundwater storage, The Yakima nation is also working on promising solutions. We're working with other partners, including academics, to help quantify where we are incidentally conserving water.
- How are you addressing the new issue of water for data centres?
    - It's not an issue in the Yakima, though it is elsewhere in the Columbia. We have a lot of hydro power agreements, so we need to be careful about that being used to address peak demand and potentially threatening ESA commitments, leading to more conflict and litigation.

Tsecmenulecwem-KT: A Collaborative & Multi-Disciplinary Approach to Managing Cumulative Impacts in the Deadman Watershed

Christina Radyo, Skeetchesn Natural Resources Corporation

Presentation highlights on the *We Repair the Land Initiative"* (See PPT for more details):

- Background: Skeetchesn's tradition of stewardship; concept of land, water and everything being connected.
- Deadman watershed overview; Home to Chinook, Coho, Pink, Kokanee, Steelhead and Rainbow Trout, with cumulative impacts from a range of activities, including two catastrophic wildfires that have burned 60 percent of the watershed since 2017.
- Collaborative Initiative established in 2023 by Skeetchesn to better understand and respond to the impact of wildfires, but based on stewardship work that they've been doing for many decades.
    - Work under the initiative includes research, monitoring and restoration focus areas.
- Progress to date: Established a true adaptive management program, including a coordinated monitoring network with 12 monitoring stations, technical partnerships, peer reviewed publications, baseline studies, annual gatherings to strengthen relationships and share knowledge; also implementation of priority restoration projects and co-development of the Deadman Watershed Monitoring, Mitigation and Adaptive Management (MMAM) Plan.
- Success factors: Focus on knowledge sharing, with strong interdisciplinary partnerships and clear data sharing agreements; Skeetchesn leadership, local presence and coordination; annual gathering to support relationships and knowledge sharing; coordinated watershed monitoring network; and collaborative development of the MMAM plan.
- Lessons learned and priorities moving forward:
    - Importance of local monitoring capacity/user friendly equipment and ability to access data in real time.
    - Meaningful community engagement via long-term relationship building.
    - Long-term funding to sustain capacity and momentum.
    - Translating science into management action — we've made strides but it needs more work, so we're exploring ideas.
- Skeetchestn's long term vision for the Deadman watershed. Skeetchsn's leadership — anyone wanting to do research in the watershed comes to the Nation. We're not going anywhere — we're building long-term indigenous capacity for the future. Integrating science and Skeetchestn values into decisions, and caring for the watershed for future generations. It's not just about justice, but the relationship with the land leads to better outcomes.

Discussion

- The wide array of people and tone of collaboration at the recent gathering was impressive, How important is this for the success of the project?

- We're dealing with unprecedented issues and we understand that we can't do it alone. We also understand that others share our goals and that we need a broad range of expertise to solve these problems.

Towards Coherence: Tactical Guidance for Working Differently

Rene Henery, Trout Unlimited

Presentation highlights examples of successful collaboration in a challenging context of cumulative effects, from the Reorienting to Recovery (R2R) project in California.

- You know it's time to try something new when all parties want the same thing but it's not happening, and all are feeling frustration.
- How we often work together — compared to what's possible:
    - How we often work is focusing on solving for our own interests, with our strategy/cards hidden, and adversarial or transactionally collaborative.
    - What's possible: advocating for a collective set of interests, with transparency (cards on the table) and cooperative/reciprocal collaboration. This does not mean abandoning our own interests but recognizing that we are part of something bigger.
- Foundations for coherent collaboration: core components and vibes:
    - Core components include a group of people who want to work together, with a common understanding of the world/system, a common set of objectives, and a structured, transparent process to consider actions together.
    - Vibes include receptivity, authenticity, caring (intent to build trust) and a healthy stretch zone.
- Zones of tolerance explained: We all have have our comfort zones, a stretch zone (where we can come our of our comfort zones to collaborate — i.e. the difficult but rewarding zone where growth and learning occurs) and our panic zones (no go areas where fear and defensiveness take over).
- Reorienting to Recovery (R2R): Project to recover Chinook in California's Central Valley.
    - "If you want to change the system, you need to get the system in the room" — and actively engaged in the discussion.
    - Central Valley overview: highly developed and complex.
    - They set out to create a new approach for salmon recovery based on identifying a preferred scenario and suite of actions that would advance salmon recovery, while balancing other interests to achieve a critical mass of support.
    - Three project phases; diverse design team; with multiple inclusive groups to support participation and engagement.
    - They started by reaching out to existing groups and forums, built out an existing lifecycle model and shared it publicly; then developed a common set of objectives for salmonid recovery and for related values and interests.

- Recovery definition:
    - On target abundance, it was recognized that success would lie within a range, and would require a values-driven conversation.
- Example: Values translation process.
    - A structured, transparent process to consider actions together. Structured decision making is only as successful as the trust and coherence in the collaboration, so that needs to be built first.
    - R2R Phase 3: Balanced scenarios: No one was happy with the baseline, so that provided very valuable motivation.
    - Scenario to advance: modified tortoise

Discussion

- How do you deal with it when the values driving people are in direct conflict with each other?
    - We structured the project to avoid pitting values against each other. There will be tradeoffs. And the orientation to those tradeoffs changed once we changed the dialogue and the relationships and got people to reorient so that they didn't see things in a purely binary way.
- How was it possible to get everyone to agree on salmon as the priority?
    - In California it's all about water and for most people, salmon are a constraint. We also have no treaty rights related to fish. So having people share salmon as something that they all cared about provided a common ground for a discussion that would otherwise have been more politically fraught.

Q&A Panel 3

- The afternoon presenters were joined by Murray Ned, Lower Fraser Fisheries Alliance and Lisa Helmer, BC Ministry of Water, Land and Resource Stewardship.
- How do you deal with addressing cumulative effects, when it often involves changes in policies — at many levels?
    - After investing 7 years in efforts to revise the Salmon Allocation Policy, we decided to focus elsewhere. You have to ask yourself, how much do you invest in such efforts, when at the end you get policies that lack effectiveness due to a lack of political will.
- How do you manage change within an organization or collaborative group and sustain efforts over time?
    - We started out doing what Rene and others talked about, i.e. getting the right people in the room to build a common understanding and then taking that message back. As people move on and get replaced, it's important to choose their replacements carefully because it's the relationships and trust that make it work. So work on that needs to continue to ensure newcomers catch the excitement and the vision.

    - Staff and political mandates at the Province come and go, but the First Nations partners and other local stewards are rooted in their communities and it's them and those enduring relationships that will persist over time.
- Especially for BC, where we're still lacking a framework for assessing cumulative threats, how do we know when we're on the right track and having some success?
    - It depends on where you are in the process. At the beginning, having smart objectives that encompass all the interests and values is very important because it defines the scope of the conversation. Then once you develop "the hivemind" and develop common hypotheses, then the "vibes" signal success. So that's about how people are experiencing the process, i.e. feeling safe and secure in participating.
    - We judge success based on our own values and those may differ amongst the different people, so we need to be aware of that and careful about imposing objectives.
    - Achieving success in the first on-the-ground project to reconnect former steelhead habitat was important. Success in that one small project created tremendous excitement because it was helping to meet the overall goals and it encouraged everyone, including funders, and helped to inspire others.
    - A Washington process has had similar successes but not in a way that favoured one stakeholder and that prompted resentment.
    - It's very important to celebrate the small wins when you find them, and to involve ceremony.
- The answers sound simple and fundamental so why isn't it happening more broadly? How do we move from a few precious examples of success to success becoming the norm?
    - A lot of universities are trying to answer that question. Once you get these groups going, they still require constant care and feeding. It's all about relationships, trust, respect and a common vision of the future. It's easier to wreck with negative energy than to feed the positive energy they need to sustain it.
    - In the Yakima, people came to the realization over decades that no one was going to get all they wanted, and enough people were willing to get on the boat. In the wider Columbia, not everyone is there yet. So it's about how quickly you can move people towards that.
    - It is basic and formulaic. There is an invisible massive body of trauma out there complicating what would otherwise be fairly straightforward work. Trauma from the difference between what you think the world should look like and how it is. So it's a kind of PTSD, which is more pronounced the longer you have been affiliated with these communities ties. So it's about getting people to step out of their comfort zones, identifying the coalition of the willing and identifying an appropriate scale of change for that situation. But once coherence happens, it's contagious and self-propagating.
    - If you can get that kind of progress in a context as complex as California, that offers a lot of hope to us in BC.

- What role do local communities and stakeholder play in supporting healthier watersheds and how can their engagement be strengthened?
    - The challenge is how to bring them in meaningfully, how to demonstrate change and ensure we're planning for the long term, not just for the here and now. Simple things like getting out on the field together can be so powerful.
    - It's important to show up to community events, not just when you have a specific ask.
    - I see local groups having the capacity and the interest in doing much of the work. But we often see redundancy, so we need more awareness of the work that is already happening. We also need provincial and federal champions to ensure their work is aligned with ours.
- This morning we discussed salmon recovery falling through jurisdictional cracks, so how can we do better to bridge the silos and do better for salmon recovery?
    - From the Provincial perspective, we welcome new ideas for how we can do better. We need to be strong and resilient enough to walk the data (western and local) to decisions. We need to engage industry, regulators and decision makers, ensuring they are aware early in the process about the perspectives that are out there. It does take some boldness, e.g. cases where we've held the pen with First Nations to write policy that was brought to Cabinet.
    - To change the system you need to bring the system to the table. You need to bring all the people to the table. It's hard and a lot of work. What we have in the Lower Fraser is not so much a fish and water problem. We have a people challenge. We also need radical change to the current systems to make it possible.
- Addressing cumulative impacts at a large scale is daunting, so what are some ways we can make it achievable?
    - We've heard good examples, such as in the Yakima and California. Common elements are building a coalition of the willing and a common vision for the future that recognizes the world is changing and that we need to be flexible. There are successes, so we need to identify and highlight them. We also need to recognize that our systems were not set up to protect salmon but to support industry.
    - You need a common understanding of the facts in your particular situation; and a coalition of the willing. Keep showing up and a lot can be accomplished, one bite at a time.
    - That common understanding can be facilitated with models.
- Any parting thoughts?
    - Appreciation for such opportunities to share the work being done, and for others doing this work.
    - Lots of myth busting is needed. Also getting out of our comfort zones.
    - Appreciation for the knowledge sharing, for providing hope, and for highlighting the importance of both people and science in finding solutions to these complex issues.

Adjourned