

Restoring Fraser Chinook Salmon Workshop

Connecting good science with good decision making

**Co-hosted by Fisheries and Oceans Canada and
the Fraser Salmon Management Council**

11-12 December, 2023 | River Rock Resort (Richmond)/Zoom Hybrid



Executive Summary

Background

- This workshop was co-hosted by Fisheries and Oceans Canada (DFO) and the Fraser Salmon Management Council (FSMC) to identify technical approaches with high potential to inform Fraser Chinook conservation and management in the short/medium term, addressing the central question of rehabilitating depressed populations and how to better coordinate collaborative approaches for doing this.
- Workshop design was driven by DFO's desire to ensure that science work is coordinated to inform key management questions. Workshop co-host FSMC is partnered with DFO in the new Fraser Salmon Management Board (FSMB), which has identified Chinook restoration as a key priority. FSMC's Chinook Recovery and Rebuilding Initiative (CRRRI), currently nearing completion, seeks to improve understanding of First Nations' technical capacity, interests and potential as key partners to ensure a strong indigenous technical role in Chinook rebuilding.
- Workshop participation was by invitation, bringing together about 50 First Nations, DFO and other technical experts working on Fraser Chinook conservation and restoration, along with key managers who rely on science to inform decision-making (see Appendices for the list of attendees).
- Day 1 defined and explored the key challenges and then invited proposed solutions. An Open Space dialogue cast a wide net to identify challenges, followed by a series of exercises to sharpen the focus and eventually to identify five specific tasks around which participants chose to prepare work plan proposals. Day 2 consisted of intense group work to develop "pitches" for why each group's proposal was a priority and to flesh out a draft work plan.
- A joint DFO/FSMC technical group met to review the draft report and proposals, to explore where further scoping would be helpful, and to identify initial work/steps to consider for immediate implementation. Suggestions received during review of the draft reports were also added and those are summarized under "Joint Technical Group comments" below each proposal, both in the Executive Summary and in more detail in the main body of the report (Pages 12 - 19).

Key outcomes:

- Five priority work plan proposals, plus feedback on those from the joint technical group, as summarized in the recommendations below.
- Broader recommendations summarizing key participant insights, including on effective Chinook rebuilding strategies and winning conditions.
- Less tangible but valuable outcomes included the new personal connections, strengthened relationships and shared understanding forged over two days of intense, positive, collaborative technical work. The workshop was structured to maximize hands-on engagement and participants clearly welcomed the opportunity to sit down in multilateral groups, roll up their sleeves, exchange thoughts and brainstorm solutions together.

General recommendations:

1. DFO, FSMB, and indigenous and other groups should further develop and implement the draft work plans where those align with their existing work, work plans or broader mandates.
2. FSMB (or DFO and FSMC as the key parties) should consider what structures are needed to support the governance, coordination, and integration of the work required to further develop and implement proposals needed to support the restoration of Fraser Chinook (For more on this, see Proposal #3).
3. Build on what's already there. Start by exploring existing knowledge, opportunities and work already underway, including discussions with potential partners and appropriate leads to maximize efficiency and avoid duplication. This speaks to the value of a central hub, coordinator and/or steering group tasked with aiding technical coordination between multiple (and mostly extremely busy!) potential partners.
4. While not all work needs to be done collaboratively, ensure collaborative planning and coordination, both internally and externally, recognizing that Fraser First Nations are key governance and technical partners over the long term.
5. Prioritize work that directly informs and supports effective management responses to pressing management questions.
6. Pay careful attention to project scoping to identify immediate priorities and clarify feasibility across different time scales. Identify initial steps and phased approaches where needed.

Key recommendations - Project proposals:

1. **Tools and Technology:** This is about improving guidance for recovery teams on appropriate tools and how best to use them. It involves work to evaluate available tools, to help recovery planners understand which tools are available and how to use them, and also to identify missing tools that should be developed. Work to produce technical papers would be led by a collaborative Task Force (synergy noted with Data proposal).

Joint Technical Group comments:

- Already momentum with DFO/PSF discussing potential funding, and capacity to start proposed work. Important to scope to avoid duplication and engage nations in the work. Propose also exploring potential opportunities to support this work via the Pacific Salmon Strategy Initiative (PSSI).

2. **Data Visualizer:** Building on PSF's Pacific Salmon Explorer and other existing tools, start with Fraser Chinook to develop a provincial salmon portal and database with multiple data layers that supports visualization of Chinook data, that is accessible, provides real-time data, and integrates indigenous knowledge.

Joint Technical Group comments:

- Propose further scoping to clarify concept, identify priorities for data needed to support Fraser Chinook conservation and rehabilitation and coordinate with other work planned. Potential fit with PSSI and current DFO work (Eric Quan, Sue Grant) noted, but need to address who would develop this proposal.

3. **Integrating the 4Hs: Ecosystem approach across the management spectrum:** This is a call for committing to effective integration across the management spectrum and engaging all

government levels and partners to address how to integrate management across the 4Hs (habitat, hatcheries, harvest and hydrology) to achieve ecosystem-based management. Fraser Chinook would provide the necessary focus to an integrated management approach that thinks across species, watersheds and realms of management.

Joint Technical Group comments:

- This could address the critical need for governance and technical coordination support that participants highlighted, with DFO and FSMC using existing models such as the Chinook Strategic Planning Initiative (a CSPI 2.0?) or the WCVI governance model for Chinook restoration and an approach consistent with potential future requirements under the new Fish Stock Provisions..
 - Can also help FSMB deliver on its Fraser Chinook rebuilding commitment and offer DFO with a model for implementing UNDRIP commitments. Given the importance of maintaining momentum, initial steps in 2024 could include appointing an interim joint steering group to explore potential governance models and to coordinate, further scope and prioritize technical work.
 - Propose inclusion of the Province, given their jurisdiction over key levers, and new tripartite opportunities (\$100 million Watershed Security Fund and Healthy Watersheds Initiative).

5. Ecosystem and Life History Informed Assessments: Identifying key pinch points in the life cycle to better inform managers and stewards on where to focus and what are the big problems that we can address. The proposed approach involves a Steering Group, with FSMC as a potential vehicle, and two proposed workshops: the first would be a high-level Risk Assessment Method for Salmon (RAMS) process; the second would involve clients to make the case for long-term funding.

Joint Technical Group comments:

- Proposed nesting this under Proposal #3 (Group 3 focussed on process, Group 5 on stock assessment model to support it). An interim steering group could further scope and guide proposal development. A series of watershed-level RAMS assessment workshops will require significant funding.

4. Climate Change scenarios workshop and implementation framework: Proposal for two workshops: The first is to establish alignment on plausible scenarios and recovery objectives (With what future are people comfortable?). The second workshop is about biodiversity and social objectives. Proposed DFO/FSMC Steering Group to lead, with an FSMC coordinator position to support. Results would inform restoration work.

Joint Technical Group comments:

- Clear benefits seen in an improved shared understanding of objectives and better informed adaptive management decisions, but is another workshop describing the problem the right place to start, or are we past that? Proposed that FSMB further explore this in looking at Climate Change adaptations in Chinook management.

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Workshop Background

Co-hosts: Fraser Salmon Management Council's (FSMC) Chinook Recovery and Rebuilding Initiative (CRRI) and DFO Science.

Workshop Question: What do we need to rehabilitate Fraser Chinook?

Objective: To identify areas of research that warrant further investigation because of their high potential to inform salmon conservation and management, while identifying opportunities to make salmon science in the Fraser watershed more effective in the future.

- Focus on: Research/Monitoring/Assessment: What do we need to work on?
- But not ignoring: Logistics/Governance: What are key implementation challenges and how will we work together?

Format: Approximately 50 invitees in technical and management roles from DFO, First Nations, the Province, non-government organizations NGOs and academia spent two days in intensive hands-on facilitated plenary and small group sessions addressing the workshop questions and collaboratively drafting proposed solutions. Their task was to draft actionable proposals for key first steps in a new collaborative approach to addressing the complex challenges facing Fraser Chinook. Intended outputs include a plain language summary report with recommended next steps and action plan.

(More info: See Appendices for Workshop agenda, agenda materials and participants list)

Proceedings: Summary Notes

Welcome and Orientation

Greg Witzky, FSMC and Diana Dobson, DFO welcomed participants on behalf of the co-hosts, and highlighted the need for collaboration given the complexity and significance of the work required.

- FSMC highlighted the Southern BC Chinook Strategic Planning Initiative (CSPI; 2014-18) as a successful model for collaboration. The lack of a mandated process for Fraser and Approach First Nations to endorse the final CSPI strategy was a key obstacle to implementation. However, the 2019 Fraser Salmon Collaborative Management Agreement establishing FSMC and the Tier 2 Fraser Salmon Management Board (FSMB) provided a key missing piece.
- Restoring Fraser Chinook, and ensuring a strong Indigenous technical and leadership role in that work, are key priorities for both FSMC and the bilateral FSMB. FSMC's BC Salmon Restoration and Innovation Fund (BCSRIF)-funded CRRI project will incorporate advice from this workshop in a final 2024 report, including recommendations on required structures, supports and priorities for technical collaboration to support and integrate the work of multiple players at multiple levels needed for successful long-term restoration of these populations.

- DFO highlighted the critical importance of collaboration to advancing the Department's conservation goals and the need to better compile and synthesize information to inform collaborative work. Also stressed were the need to take a life history approach, with climate change as a key factor and, in generating science to inform collaborative management, how to ensure we make our science actionable — i.e. by providing results that support the work of managers, stewards and other users.

Facilitator and Workshop Planning Committee Co-Chair Marcel Shepert reviewed relevant CRRRI work (some still draft) being developed and compiled to inform proposed collaborative approaches (See frasersalmon.ca/crrri). These included a poster series by Dave Levy and Richard Bailey, which Levy briefly introduced, offering a big picture perspective on “what it will take” to successfully restore Fraser Chinook populations over the long-term, instead of “palliative care”.

DFO's Ann-Marie Huang, Workshop Planning Committee Co-Chair, reminded participants of the distinction between formal terminology used in the Species At Risk Act (“recovery plan”), Wild Salmon Policy (“conservation plan”) and the new Fish Stock Provisions of the Fisheries Act (“rebuilding plan”). She also reviewed DFO's legislated obligations under the Fish Stock Provisions and their relevance to this work. Once specific fish stocks are “batched” or added to the prescribed list in legislation, DFO is required to assess the status of a stock and develop a rebuilding plan if it is below its limit reference point and review it periodically. The five Fraser Chinook Stock Management Units (SMUs) were not included in the initial two batches, but DFO has already started working on FSARs (Fisheries Science Advice Reports), which are a new format for DFO Science advice that is meant to support the implementation of Fish Stock Provisions. FSARs will address stock status, trends, Limit Reference Points and assessment against those and probable causes of declines. DFO plans to have FSARs reviewed through the Canadian Science Advisory Secretariat (CSAS) for all five Fraser Chinook SMUs by December 2024.

Day 1 Group Exercises

In person and online participants were guided through a series of group exercises (Draw The Problem, Open Space, Name That Bucket and Dotmocracy) that included problem identification, suggested solutions, clustering of solution themes and then prioritization. (See Appendix for detailed inputs.)

Draw the Problem

Participants highlighted the following key challenges in the initial exercise:

- Shifting baselines: With factors like climate change and non-stationarity, what is the appropriate rehabilitation goal in a non-stationary world with new pressures.
- Unclear mandates: We have been challenged to learn from and to implement past work. Too many conflicting interests often means decisions that don't benefit salmon. Indigenous priorities are also not being honoured.
- Complexity: With cumulative impacts (death by 1,000 cuts), where should we focus our limited capacity to mitigate? Which part of the problem is ours to solve? How do we make

decisions with limited information? Restoration will require addressing multiple issues including water use, land use planning, and the need for more public education. These factors and more make it a very complex problem.

- **Short term thinking:** The time scale of needed action to address key factors, like climate change and restoring hydrological regimes, does not match the time scale of funding. The focus has been on short-term initiatives lacking long-term continuity.
- **Working in silos:** We do not know what everyone else is doing. There is no effective management system to support sustainable rebuilding. First Nations, the Province, DFO and academia are all working solo, instead of collaborating on a shared plan with shared priorities that is informed by science. There are examples of successful collaboration that we can learn from, such as Cowichan and West Coast Vancouver Island (WCVI).
- **Governance gap:** There is no clear governance structure bringing people together and holding feet to the fire so we have piece-meal approaches. We need to define the problems and feed that into a governance structure to advance solutions. The problems will require actions at different scales, from restoring natal streams to questions about Salish Sea carrying capacity. We need a strong First Nations presence to tie it together, along with a long-term restoration framework, an endowment to ensure long-term funding and a shared vision that will support a long-term and stable commitment.

Having established a fairly unified overview of key challenges, participants were then challenged to use their remaining time to develop recommendations for technical work that could be undertaken over the short- to medium-term to start moving forward collaboratively. While the focus of this work was on proposed technical solutions to inform management, a common theme reflected throughout their outputs was the importance of governance and coordination structures to ensure effective collaborative responses.

Open Space, Name that Bucket, Dotmocracy

*The following three exercises were all focused on answering the question of “**What do we need to rehabilitate Fraser Chinook?**”*

- **OpenSpace:** Participants shared suggestions addressing both technical and broader factors critical to success. Technical suggestions included work to deepen a shared understanding of problems and solutions, and development of tools and supports to help focus and coordinate efforts, and foster collaboration. Many responses also addressed the importance of governance/leadership/commitment, a shared strategy, long-term funding and fisheries management reforms. (See Appendices for details)
- **Name that Bucket:** Participants identifying appropriate categories, but grouping the above suggestions proved a challenging exercise. The group settled on eight categories, which were then used for the ranking exercise that followed.
- **Dotmocracy:** Participants used sticky dots (in-person) or answered a poll (on-line) to “vote” on priority topics, with results tallied as follows:
 - Governance and process: 66
 - Collaboration and coordination; coordination and outreach: 52

- Life history and ecosystem informed assessment: stock assessment; marine conditions; genetics and life history: 48
- Ecosystem-based management: cross-cutting issues, species interactions, science and TEK: 42
- Data management and sharing: 36
- Funding and resource allocation: 34
- Tools and technology: 29
- Adaptive management: 15

Notwithstanding the workshop's focus on addressing technical questions, the strong emphasis that participants placed on factors outside our scope (governance, systems to support collaboration and outreach) was acknowledged, with a commitment to ensure the critical importance of those factors was reflected in the workshop recommendations. This was reinforced by the Day One closing thoughts offered by one participant, as summarized below:

While the workshop focus is science, it's essential to connect that to the required strategies, policies, process, communication and governance to ensure our work is effective. The advice on governance/process that won't be addressed here should be compiled and shared for others to work on. Things like funding will affect everything we do, so it's important to highlight where funding is an impediment. Communication is also everyone's responsibility, and affects the results of everything we do.

Day 2: Proposal Development

Welcome and Recap

DFO thanked FSMC for providing the good food and refreshments to fuel the work required.

Marcel began by acknowledging that grouping the wide-ranging Day 1 input was hard, with lots of diverse ideas and perspectives shared. Day 2 will consist of a series of group exercises to flesh out priority technical/science topics, with the intent of producing a series of concrete, actionable proposals to start advancing priority work required:

- New York Times (NYT) Headlines: A pitch that communicates the group's "big picture" vision for the more specific task proposal that they will work on throughout the day.
- OBOES (Objective, baseline, options, engagement, supports): Fleshing out the proposal: ensure it includes considering and identifying governance, communication and collaboration needs.
- The Big Pitch: Draft proposal outline. Group leads will circulate to share their proposals with other groups, answer questions and seek feedback to refine the final plan.
- What's the Plan, Stan? Groups will present their final proposals during the final plenary session.

Discussion

- What's the scope? The NYT Headline describes the over-arching aspirational goals. The detailed project plan can be for a task at any scale, but it must be a doable, high-priority task that can be accomplished in the short/medium term or a pilot that provides a foundational "brick" to start building the overall structure envisaged.
- How will the co-hosts address the remaining gaps? The Poster Series provides an example of a collaborative restoration strategy overview, highlighting the idea of it being both Top Down/Bottom Up, and supportive without being overly prescriptive. Addressing the missing governance pieces and structures for collaboration will be key to providing top-down leadership and coordinating bottom-up work to design and implement specific solutions. The NYT Headline Visions will inform additional work needed for follow-up in specific topic areas.

NYT Headline Results

Group 1: Tools and Technology: How to help salmon come back? Let's sift through the toolbox

Members: Richard Bailey, Chrissy Czembor, Richard Bussanich, Sean Naman, Matthew Bayly, Howie Wright

The goal is to provide guidance for recovery teams on appropriate tools to support their work and how to use them. The task includes researching and evaluating the many options out there, providing advice to help recovery planners understand the tools, and explaining how the tool could be used for recovery planning, including the data and analytical work needed to do that. In

the longer-term, where tools are missing, the project would also identify tools that need to be developed.

Group 2. Data Group: Swimming upstream - Comprehensive Live Salmon Database:

Members: Sonora Morin, Aidan Fisher, Michael Staley, Merran Hague.

Fraser Salmon Visualizer: A state-of-the-art, accessible database open to everyone, with live/real time data and information at the watershed, Conservation Unit (CU) and stream scale (first-cut data). An expanded version of PSF's Pacific Salmon Explorer would include data on marine migration, impacts, climate; in river, catch, spawners, and indigenous knowledge (IK) — where it can be shared safely — along with links/contacts for all current projects (research, escapement, restoration).

Group 3: From Rags to Riches: From Canary to Keystone: Salmon rule again

Members: Catarina Wor, Jessica Moffatt, Les Jantz, Lynda Ritchie, Kelsey Campbell, Ken Malloway, Marc Labelle, Quinn Anderson, Teri Ridley, Timothy Healy.

This is about bringing salmon back from the brink and working together for the better, using ecosystem-based strategies to protect, conserve, and recover Fraser River Chinook and the places they live. It's about positioning salmon as the keystone species or vital link to drive a multidisciplinary approach to protecting and restoring salmon and their ecosystems, with integrated management across the four Hs (Habitat, Hydrology, Harvest and Hatchery) to achieve salmon prosperity.

Group 4: Climate change driving need for a radical approach: Throw away the baggage and work together!

Members: Brittany Jenewein, Sue Grant, Dave Levy, Pat Matthew, Gord Sterritt, Nicole Frederickson

Tripartite partnership takes a radical approach to reduce vulnerability of ecosystems to climate change. DFO, the Province and First Nations come together to enable out-of-the-box solutions, recognizing that the impacts of climate change are only going to get worse, and the task of restoration harder if we don't come together and act now.

Group 5: Life History/Ecosystem Model: 2050: 25 years of work saves Fraser Chinook

Members: Alston Bonamis, Chantelle Caron, David Patterson, Cam Freshwater, Shamus Curtis, Diana Dobson, Eric Hertz, Rachel Hornsby, Lauren Weir

This is about development of a life history/ecosystem model that identifies key bottlenecks and guides targeted long-term restoration work. The long-term results would include food needs being met once again, as healthy populations are restored, with restoration of wetlands and improved forestry practices to ensure long-term sustainability.

OBOES and Big Pitch Exercises

Groups worked through the detailed OBOES exercise to develop and refine work plans to advance their NYT Headline visions. The proposals were then refined with feedback from other groups, which included identifying potential synergies.

Final Group Proposals

(See group notes in the appendices for more details)

Group 1: Tools and Technology

Objective: Advice for restoration teams on which tools are available to support their work, plus when and where they should be used.

Baseline: Lots of tools are available but it's not always clear how to choose from those options and how best to use them.

Adaptive management (Plan, Do, Learn) approach (graphic): Set goals, inventory (status and trends), identify problems and potential actions, select appropriate actions and priorities, design actions and monitoring, implement, monitor and evaluate data, then adjust actions/goals.

Proposed tasks:

- Establish typology scheme with technical experts to understand which models are similar.
- Research existing guidance on using available models, and where gaps exist, identify what's needed to use the model usefully.
- Parking lot: There may be models in other jurisdictions, so research needed to see which may be relevant here.
- Need process for emerging science/development to provide new tools where needed.
- Deliverable is a paper on what is available.

Engagement: This work should be led by a collaborative group or task force that includes technical experts, First Nations champions, the Province, DFO and academics, who would lead in the writing of these documents and in pitching the need for them.

- Involve people who created the existing models.
- For models without guidance for practitioners, rely on experts, pull in staff, interns, etc to gather the information required.

Winning conditions:

- Chairs for this task force will play a key role in “herding cats,” ensuring the work gets done and convincing leadership and managers that this is needed. Potential champions include Richard Bailey, Jordan Rosenfeld, Astrid and Janson Wong (First Nations Fishery Council - FNFC), Jason Hwang.
- Science can provide guidance on what tools to use, but governance needs to be in place to support and empower the work required at the watershed level.

Next Steps

- Group leads are to draft a work plan, pitch it to management and start the work.
- First Nations technical reps, science and governance representatives all need to be involved. Also users, as we need to ensure the end users will feel empowered by the results.
- Feedback identified synergies with the ecosystem management group.

Joint Technical Group comments:

- DFO/PSF are discussing potential funding, capacity to start proposed work.
- Further investigate what's been done/planned to coordinate and avoid duplication.
- IF DFO/PSF lead initial work, ensure Nations/AAROMs and practitioners are engaged.
- Proposed work is clear, initial steps appear feasible, plus clear link to improving management.
- Propose also exploring potential opportunities to support this work via the Pacific Salmon Strategy Initiative (PSSI).

Group 2: Data Management: Fraser Salmon Visualizer

- **Objective:** Start with the existing Pacific Salmon Explorer tool and build upon it, starting with Fraser Chinook, one data layer and using that to expand (to all Fraser salmon, province-wide). The intent is to support visualization of Chinook data using existing tools where possible (i.e. not to invest in the development of the tool itself).
- **Implementation Milestones:** Focus (What do we have); Layers (standardization needed); Design (cross pollination of data and applications); Start (non-contentious data, e.g. water quality, idea of sharing live data); Collaboration (starts with tool development, inclusion of IK and ensuring it's appropriately protected).
- **Beginnings:** Need leadership group to agree on project. Data is available to start now, plus interest in consistent data gathering. Data collectors, systems to tap into and partnership response teams are all ready to do this.
- **Areas of Growth:** Overview and examples of what has/hasn't worked. NOAA has a helpful model similar to what is proposed and we know there is a lot of data and potential partnerships to do this.
 - What hasn't worked is trying to bring all the resources into one place. A variety of organizations currently house a substantial amount of data, but it's not always clear where it is and how to access it. It will require a substantial personnel investment to ensure it works properly, especially with live data. There are also concerns about sharing mechanisms/consistency. Where to house this also remains unresolved. Short term goals, visualization of the system and its applications also needed.
- **Success dynamics:**
 - Impediments: Data control/silos, IK issues.
 - Steps to achievement: From initial commitment to appropriately characterizing data quality

- Who needs to be involved: everyone who generates data; leadership responsible for funding, users.
- Decision makers: BC, federal agencies, Nations, data control team, data holders and providers.
- **Collaboration:** Technical team, technical, logistical and governance considerations
- **Detailed recommendations/action items:** Detailed annotations (people who collect data); data updates appropriately, version control, data quality and methods description.
- **Quote:** “Our modern, accessible, state of the art visualization and data support system that will transform our knowledge of fish and their environment.”
- **Feedback questions:** How to access consultant/proprietary data? How would real-time data be applied? How to get buy-in for using this portal? Need for a steering group, How to stay within scope? Sharing commitments.

Joint Technical Group comments:

- Propose further scoping to sharpen initial focus, clarify concept and more specifically identify priorities for data needed to support Fraser Chinook conservation and rehabilitation.
- Also address how best to integrate and coordinate with other work planned or underway.
- Will need to address additional technical questions, including IT, data security.
- Potential fit with DFO’s PSSI mandate and additional potential opportunities for collaborative work include PSSI work on data (Eric Quan's group), and DFO Science (Sue Grant work on rapid salmon stock status assessment tool).
- Can this be further refined as a medium term task? Who would do that?

Group 3: Ecosystem-based approach across management spectrum

Objective: Integrating the 4Hs in management as a step towards achieving ecosystem-based management.

- Coordination/joint planning that considers management, hatcheries and restoration planning including planning for hydrological recovery, habitat protection.
- Watershed-based approach and structures that consider the whole salmon life cycle — fisheries, marine areas, migration routes, and whole ecosystems needs. If you fix the ecosystem, the rest will take care of itself.
- No progress without proper governance, good data, prioritization.
- Think outside the box, understand why past efforts failed and manage change properly.

Ideas on governance:

- Governance and technical tables at multiple levels.
- Engage various government levels, including First Nations, to achieve an integrated management plan for salmon.

- Can focus on Fraser Chinook but need to think across species, watersheds, realms, including terrestrial species.
- Need buy-in from senior management for it to happen: Bottom-up incentives/top-down agreement.

Regional level planning

- Regional tripartite table: Commitment from senior levels that will drive the process, access funding, agree on the issues, set priorities.
- More holistic 4H integrated salmon management plan: pilot, more community based plan?
- Promote regulations reform for fish: Water use, Forestry and land-use practices, Linear practices.

Subregional tables

- Secretariat group for Fraser Chinook, with a process to identify priorities, immediate action items for all the Hs.
- Use existing structures: FSMC/ FSMB (e.g. or sub-regional governance?); build support structures at sub-regional and regional level to address funding, regulations, laws, policy.

Watershed and population/ deme level work

Habitat, Hydrology, Hatcheries, terminal harvest?

- Indigenous-led guidance on spatial recovery table aggregates.
- Responsive to prioritization at other levels of planning; work on immediate, mid and long term recovery.

Tripartite tables:

- The right people in the right roles (fed, Indigenous, BC, municipal) technical capacity.
 - Balance technical capacity, TEK/IK, other capacity, funding?
 - Who else should be there and when (NGOs, industry).
 - What authorities would they bring to the table, what knowledge, what capacity.
 - Clarify roles and responsibilities

Activities to be considered at a watershed level planning table

- Habitat: Prioritize protection, restoration; develop Pacific salmon specific best management practices; ecologically functioning stream crossings, riparian protection, restoring connectivity
 - Do no harm: Research to ensure it's good, adaptive management (actions must be reversible)
 - Develop ecosystem-based approach to evaluating habitat status/ecosystem health, considering a broad spectrum of indicators.
- Hatcheries: watershed conservation/restoration needs inform hatchery planning; establish priorities, Spring 42, Spring/Summer 52 triage, plan for emergency events.
- Harvest: regional priorities inform watershed hatchery planning.

- Hydrology: recommend land use regulation/policy changes to address hydrology.
- Fish health

Model for Process: Step by Step

- Agree on values for watersheds/species: consider a multi-value, true ecosystem approach
- Gather available data and tools, gap assessments, (IK, western science)
- Determine recovery objectives, performance metrics, what does success look like
- Determine limiting factors and threats/pressures
- Determine potential actions to address threats: evaluate tradeoffs, explore all actions then determine which to undertake, don't limit early, think big and put everything on the table
- Implement actions, monitor, rinse and repeat — iterative, adaptive.

Why didn't past attempts work:

- Disagreement on basic data: Not easy to resolve; may require dispute resolution bodies.
- Defaulting precautionary principle: Identify gaps and how to deal with them early to avoid derailing progress in later stages (limit reference points for Fraser Chinook, how to incorporate TEK better (“Two-eyed seeing”), when to consider environmental indicators in management.
- Political Interference: Establish all-party agreement on issues, objectives, principles, end points, etc, leadership support, accountability.
- Lack of funding: All parties contribute, flexibility, creative consolidation, long-term funding
- Past practices have not been inclusive enough. Multi-disciplinary, multi-government, multi-representational is better.
- Too worried about perfect data/solutions — paralyzes decisions, parties become more positional: Monitoring and adaptive management; Precautionary principle; Evaluate data gaps and action important data series.

Recommendations

- Establish a governance process that includes the key parties, Federal, Provincial, First Nations, etc. and regional bodies.
- Out of box thinking re solutions to past problems (changes, ideas to test).
- Put fish first, examine the authorities and how they affect fish. Are they causing harm, why and how to change that?

Joint Technical Group comments:

- This could be “CSPI 2.0”, with DFO and FSMC as lead partners in a steering group to establish a new collaborative technical/governance structure to coordinate and support the necessary work and planning. This approach could help FSMB “outsource” and deliver on its longer-term work plan commitment to Fraser Chinook Rebuilding, while providing a model for implementing Canada’s UNDRIP commitments. While advice on governance is outside our scope, participants strongly endorsed the concept of such a

structure as essential to successfully advancing and coordinating their technical work to support management.

- WCVI Chinook and CSPI processes as potential models. Fraser Chinook are technically far more complex than WCVI, but FSMC's potential as a mandated First Nations partner is a significant asset, and one that addresses a key obstacle to CSPI implementation.
- Both WCVI and Okanagan Chinook are now listed under the Fish Stock Provisions, and the rebuilding plans being developed collaboratively between DFO and First Nations for those could be a model for Fraser Chinook irrespective of whether the latter are listed in regulation.
- Initial steps could include establishing an interim joint steering group to explore potential models and/or to coordinate, further scope and prioritize technical work.
- FSMB/C have prioritized Chinook fishery management to date and are starting to discuss the Fisheries Science Advisory Report FSAR process, so initial steps in this direction are already underway, and could be further explored in 2024/25 work plans.
- Propose referencing and connecting this with the Province of BC, given their jurisdiction over BC crown land, forestry and agricultural practices. Past examples (e.g. Healthy Watersheds Initiative) and the new Watershed Security Strategy may be a useful place to consider salmon ecosystem values in planning. Also note the \$100M Watershed Security Fund (Healthy Watersheds Initiative).
- Other relevant initiatives/models: Tsecmenúlcwem-kt (We Repair the Land) - Deadman recovery and resiliency initiative (BCSRIF funded, Skeetchestn FN leading); Thompson-Shuswap Salmon Collaborative (TSSC).
- Watershed/deme level work could include water storage, floodplain re-connection (establishing functional natural corridors).

Group 4: Climate Change driving need for a radical approach

Objective: Climate change is driving the need for a radical approach to reduce vulnerability of salmon ecosystems to climate change.

Milestones

- Understanding Fraser Chinook vulnerability to climate change — assessment + monitoring and vision.
 - How bad is the problem? What can we affect?
- Making it everyone's problem — all users understand and are on board to make change, don't think it's a lost cause (Need to avoid being too optimistic or too negative).
- Ensure longevity of programming — keep up the momentum.
- Linking to larger processes — everyone needs to be held accountable; bigger consequences.
- Communication/outreach strategy — where are the influence nodes we can push to make change?

Baseline:

- Things that have worked: Learn from past/current examples of successful approaches.

- Things that didn't work: Being too reactive, working in isolation, single species approaches, silos. Avoid basing our plans and actions on current conditions or over-relying on 1 or 2 levers.
- What needs to stay? What needs to go? What needs to be worked around? Bring in experts to support scenario planning, include different thinkers

Options:

1. Structured workshop to challenge thinking around Climate Change and solutions. Bring everyone together (include different thinkers, maybe sociologists) to construct a story about plausible future scenarios and solutions. Regional focus and highlight success stories. Something like this may be in progress (PSF/LLTK).
2. Develop a framework for understanding impacts and implementing solutions — multi-step process; includes communications and engagement plan.

It's about defining what recovery means in a climate change context. We already have a good idea of trends and impacts on fish. Given those, what scenarios are possible (potential extremes, e.g. human conflict/effective management of water use). Southern BC habitat may become uninhabitable for some species (or we can maintain small populations throughout the range). With this, we can start to build a story about how to plan for the future.

Then the second workshop looks at management systems to identify vulnerabilities in terms of being able to respond to future scenarios.

The first workshop is about alignment on plausible scenarios and what we want to recover to, what future are you comfortable with. The second workshop is about objectives, biodiversity, social objectives, then we can start ranking them.

Engage:

- Multiple levels of government, multi-disciplinary, collaborative approach to decision making.
- Propose a DFO/FSMC Steering Group, with a core coordinator position at FSMC to advance this.
- This coordinator needs to be an innovator and strategic thinker, with excellent planning skills; also creative, unconstrained in their thinking, with an understanding of Climate Change, and a technical background.
 - Role would include planning the workshops and expanding engagement to involve different government levels, NGOs, etc, identifying an action plan, roles and responsibilities and tasks assigned to people best placed to tackle them.

Support:

- Technical winning conditions: Facilitated by specialists in scenario planning (consultants), team to pull together data/inputs, mechanism for rapid implementation of solutions.
- Logistical winning conditions: Long-term funding, ensuring the right people are there to inform, identifying champions.
- Governance winning conditions: Clear objectives developed together, ensuring leaders are there and support the objectives, established roles and responsibilities.

Everything we develop in these workshop is info that would feed into other things/planning that we discussed here today.

Joint Technical Group comments:

- See clear benefits in shared understanding of objectives and better informing managers to incorporate climate change in adaptive management, but question whether another workshop describing the problem is the right place to start, or whether we're past that.
- DFO is looking at Climate Change adaptations in Chinook management, so FSMB could further explore this with the proponents to decide whether to pursue it in full or in part.

Group 5: Life History and Ecosystem-Informed Assessments

Objective: Ecosystem and Life-History informed assessments to provide more comprehensive advice to inform the broader management context (i.e. ecosystem, climate informed). Expand the basis of stock assessment from a fishery focus to a broader ecosystem context, including climate change).

Components:

- Use a life history assessment approach with environmental variables: Move from simple life history model / assessments e.g. RAMS to more complex, more informed models as we get more data, with sensitivity analysis to identify key data gaps.
- Fill data gaps identified by sensitivity analysis to build intensive / extensive model through enhanced monitoring to collect additional information to validate model assumptions, recommendations. This includes covering juvenile, not just adult assessment.
- Long-term data sets and expanded monitoring allows us to understand impacts of climate change and identify key pinch points for Fraser salmon throughout their life cycle.
- Collaborative and cooperative delivery required from the start: identifying parameters, which indicator stocks to use.
- Guidance for standards for monitoring and meta-data.

What's proposed is not a novel approach but it has never been fully implemented, despite the importance of doing so to inform management on key questions such as where to focus restoration, and what are the big problems that we can do something about.

Baseline:

- Where are we coming from? Fisheries centric moving towards ecosystem centric.
- Would need to complete an assessment of what data we have currently to populate a life history model and identify gaps. (See tables of values started in group notes).

Options:

Enhance ecosystem based assessments:

Intensively monitored watersheds and increased environmental monitoring.

Need to consider representation / priorities:

- Freshwater: What stocks/watersheds to monitor? Prioritize?

- How to link to marine monitoring? (oceanography, juvenile surveys, high-seas surveys) – maybe more about synthesis than additional data.
- Might consider monitoring healthy stocks (more data, stocks of the future?)

Coordinated assessment and monitoring framework

Management context: not just FM, but SEP, RCOE (Restoration Centre of Expertise), FFHPP, SARP.

Steps:

1. Endorsement from DFO and partners to establish a Steering Group to drive the process (DFO, PSF, PSC, FSMC).
2. Establish Steering Group (FSMC as a possible vehicle).
3. Workshop 1: High level RAMS (maybe for one stream, one ocean). Technical process to scope the problem, ensure we agree on the variables and try to scope a framework. Includes identifying what assessment, constraints, opportunities, requirements — to identify what we can do to make it happen. Involve DFO, PSF, PSC, academia and First Nations.
4. Second workshop involves our clients, including SARA, etc, to make the business case for long-term funding.

Engagement:

- First Nation Communities identify priorities... what are the prioritization criteria?
- Province, Regional Districts / Municipalities –
- Tier 3, PSF, ENGOs

Support:

- Scientific scoping
- Data management system
- DFO Branches – Managerial Support (Endorsement).

Joint Technical Group comments:

- Proposed that this be nested as part of #3 above. Where Group 3 focussed on the process, Group 5 focussed on the stock assessment model to support it.
- An interim Steering Group could help to further scope and guide development of the stock assessment approach outlined by Group 5.
- Re proposed Workshop 1, in situations where we can already identify/agree on the biggest threats (e.g. no water, warm water, clearcutting, lack of functional floodplains and associated habitats), should we not just move forward?
- From a salmon habitat restoration perspective, Joel Harding noted his DFO group is intending to provide monitoring support and co-develop monitoring guidance specific to evaluating the effectiveness of habitat restoration efforts.
- Significant resources will be needed to support this work, e.g. workshop series at watershed scale for RAMS style risk assessments to identify key threats and limiting factors.

Closing Thoughts

Day 1 was challenging, but everyone worked really hard, with great energy in the room and everyone really delivered on Day 2. CRRI will summarize in a report, with governance feedback in a separate appendix, with that draft report serving to inform follow up/next steps.

Appendix 1: Open Space: “What do we need to rehabilitate Fraser Chinook?”

Detailed list of participant suggestions from the Open Space exercise:

Communication and Outreach/Collaboration and Coordination

- Unified direction.
- Breaking down silos - actively seek out connection and learning opportunities outside your area of expertise.
- Make time to review new info/network. Schedule it and show up for it. Communicate w/your manager this is important for effective management.
- Need more collaborative research to clearly understand the bottlenecks that Fraser Chinook are facing in order to work on addressing key issues w/o having to guess what the biggest impacts are and will allow us to focus on our resources.
- Connect knowledge development with user questions and the tools they currently use. Learn while managing and adapting the plan.
- What holds us back: lack of coordination, communication, effective engagement; issues of scale.
- Governance to effectively coordinate rehab planning actions and hold feet to the fire to ensure implementation.

Governance and Process

- What holds us back: ongoing conflict re access, allocation and governance.
- Indigenous authority for management and recovery.
- IFMP/ST reform: neither accommodates formal indigenous led governance/management. Nations are currently only advisors at both regimes. UNDRIP and UNDA are saying otherwise. We need DFO and Canada’s political will to make this change.
- FSMC to prepare a vision for Chinook salmon in the Fraser River.
- Pacific-specific management policy and implementation plans for salmon and habitat.
- Revise the Fisheries Act to devolve management to more FN authority.
- What holds us back? No defined, understood shared objectives, based on common understanding, (Padding together...)
- Address one of the major impacts, i.e. recreational fishing in marine and their political influence w/ politicians. Need to stop end-running and create a system that improves their awareness and re-creates a system where they can help rather than harm.
- Transition from integrated fisheries Management Plans to holistic plans that incorporate fisheries, habitat, enhancement, restoration, watershed, western science, indigenous knowledge, long term and short-term strategies, funding, etc.
- Trilateral commitment, leadership.
- FN can recognize what needs to be done, so put them in the drivers’ seat.

- A cohesive, comprehensive, technically excellent Fraser Chinook rebuilding strategy that reflects “out of the box” thinking. A strategy to develop excellence in Chinook rebuilding led by First Nations.
- DFO to let go of final permanent control of Chinook decision making. Un-silo their internal management/science and install a national approach led by Indigenous leadership
- Need alignment between Federal/Provincial/FN and other jurisdictions/regulations re: habitat protection in fresh water.
- Think more about how to engage/inform the regulatory frameworks (treaty/municipal/provincial/federal). How can synthesized science TEK help drive integration/alignment.
- Remove socioeconomic as a priority factor for all current management regimes (IFMP/PST) particularly where there are stocks of constraint.
- Acknowledge multi-disciplinary nature of this problem and bring together the full set of expertise to help address the problem, including economists, sociologists, environmental planners, hydrologists, geologists, etc.
- Moratorium on industry harvesting and development on Chinook habitat until collaborative plan in place for next 7G timeframe w/ assessment plan.
- 1) Identify hierarchy of controls; 2) Strategize: Which level(s) exert the most leverage? Are within your jurisdiction?
- Think Big Scale to Small Scale: Societal values/global climate -> Prov Land Use Trends (Prov/Fed land use policy, habitat regs, etc) -> Local/Watershed land use/habitat management (Local land use planning, fishing regs, etc) -> Site level habitat protection/management activities (enable local control/management/engagement).
- Where is it optimal to intervene? Depends on opportunity/jurisdiction.

Funding and Resource Allocation

- Develop a long-term funded approach which incorporates habitat, management approaches, enhancement and collaboration w/ all harvesters and government agencies.
- Long term core project funding.
- Indigenous-led opportunity: How to have more funding -> FN groups (instead of “go to” ENGOs)
- Funding (federal, provincial, local) that can be used for land acquisition, particularly for indigenous land conservation areas (ILCAs), tribal parks, etc.
- Utilize the Salmon Restoration Fund, create endowment fund.

Misc

- An indigenous-led, transboundary, long-term strategic Action Plan with clearly identified actions with appropriate governance structure.
- The future is uncertain: be nimble, plan accordingly, “redundant” contingency; perhaps more than one plan.

- Understand Limiting factors, prioritize those factors; identify actions to mitigate those factors (if feasible, including gaps)
- Move away from mixed-stock marine fisheries to more terminal selective fisheries.

Data Management and Sharing

- Central Core, Global > Local, knowledge data/info centre, led by Indigenous, linked to FN repositories.
- What plans should we be informing? Land and water use planning, major projects. What science/TEK? How to communicate? Ecosystem approach: define salmon objectives, metrics (minimum flows, temp, etc).
- Science and indigenous knowledge not just advice — it has to be the foundation for action. Funding for improved data collection and management and transparent data sharing and review, while implementing (IK) with respect and effective use.
- All Chinook science, data, models must be transparent peer reviewed, re-creatable, monitored and sharable. DFO must not be the only organization that creates, houses and implements their own models with limited data.
- Re-evaluate the data we need -> habitat etc (not just the ERs).

Tools and Technology

- Quantitative modelling: climate change projections: temp (freshwater and marine), discharge -> ecosystem responses and salmon responses.
- DNA analysis capacity hitting limits — need more labs so we can analyze more and faster.
- Tools to provide insight into future salmon production and distribution and vulnerability to climate change -> climate change vulnerability assessments (CCVA) -> CCVA (Crozier et al 2019) frameworks qualitatively incorporate western science with indigenous and local knowledge.
- Strategic hatchery supplementation on the small populations of Spring 42 and Spring and Summer 52 for 4 - 5 years, moving strategically in a coordinated habitat on water and also for fish management looking at implementing on a Section 35.1 priority fisheries.
- Tools to support rehabilitation teams: 1) Landscape level planning hydrology model; 2) RAMS style assessment to help teams prioritize actions.
- Better, faster cheaper tools to empower and facilitate community leaders make their own decisions around water management, hydrology and upland activities or salmon. [Wide area implementation] (In-stream flows, hydrology, runoff, water management — sub-basin/ tributaries/natal stream).

Ecosystem Based Management (cross-cutting issues, adaptive management, implementation, Science and TEK, species interactions)

- Honesty about ultimate causation (culture/economy of unlimited development, with restoration as a bandaid).
- Need to: 1) Establish long term goal (i.e. stock size of 20,000 in 20250); 2) CE modelling to figure out what you need to do now

- Achieve land degradation neutrality: No Net Loss of productive capacity (terrestrial and aquatic habitat at a landscape scale (watershed).
- Let go of the American Dream and lower your standard of living! Practice what you preach.
- Leverage information from other stocks/watershed to better ID limiting factors/bottlenecks to survival (e.g. marine life history).
- Think broadly — need to engage experts at multi-species/ecosystem scale. The problem (and solution) goes beyond just Chinook.
- Fisheries management!
- Holistic approach: not only Fraser Chinook but also SoG Chinook etc. It all connects and fisheries affect more than just Fraser Chinook (e.g. herring). Balance of Nature.
- Viewing local actions through a climate lens... How do actions re habitat confer resilience to climate change?

**Life history and Ecosystem-informed Assessment/Genetics and Life History/
Enhancement, Habitat and H2O stewardship**

- Data collection/monitoring
- Freshwater habitat work to support resilience
- Gaps in genetic baseline: where are we missing representative samples? Do our samples from 30+ years ago still represent today's populations? Which systems have low sample size?
- Fish need H2O: H2) regs — diversion, extraction, re-think our approach to H2O.
- Protecting habitat for fish stocks that are doing well: ID why and how to replicate those successes.
- Plan for sea level rise: where are tidal marshes going to be? Plan for change in critical habitat.
- Need return of large Chinook with increased fecundity: Rec fishery impacts of taking trophy fish.
- 1) CE modelling and management need to become the standard Modus Operandi for regional/prov/federal natural resource management.
 - Establish long-term goals (e.g. 20,000 Chinook by 2050)
 - Use Cumulative Effects modelling to figure out how you limit development now to establish the trajectory to achieve the long term goal.
- Estuary research
- More chinook: health chinook will rebuild Chinook, So what do we need to make them healthy (habitat/stressors).
- ID critical (key) habitat/ecosystem function/attributes for regulatory protection/intervention (considering future CC scenarios).

Appendix 2: Workshop Resources

- [Agenda](#)
- [Why are we here?](#)
- [Restoring Fraser Chinook - An Overview](#)
- [CRRI: More info and resources](#)

Appendix 3: Workshop Attendees

Aidan Fisher	LFFA
Alston Bonamis	FFHPP
Ann-Marie Huang	DFO
Brittany Jenewein	DFO
Cam Freshwater	DFO
Catarina Wor	DFO
Chantelle Caron	FFHPP
Chrissy Czembor	DFO
Dave levy	Levy Research
Dave Patterson	DFO
Dave Scott	UBC
Dawn Steele	FSMC
Diana Dobson	DFO
Gord Sterritt	UFFCA
Greg Witzky	FSMC
Jason Hwang	PSF
Jordan Rosenfeld	BC
Kelsey Campbell	UFFCA
Ken Malloway	FSMC
Kristin Hrapchak	FSMC
Les Jantz	DFO

Lynda Ritchie	FFHPP
Marc Labelle	FSMC
Marcel Shepert	FSMC
Matthew Bayly	MJ Bayly Analytics
Mike Staley	FSMC
Murray Ned	LFFA
Nicole Frederickson	FSMC
Norah Brown	DFO
Pat Matthew	FSMB
Piotr Cienciala	FFHPP
Quinn Anderson	DFO
Richard Bailey	
Robin Pike	DFO
Shamus Curtis	FSMC
Sharmayne Owen	FSMC
Sonora Thompson	IMAWG
Sue Grant	DFO
Richard Bussanich	TNG
Tony Roberts Jr	FSMB
Eric Hertz	PSF
Merran Hague	PSC
Rachel Hornsby	PSC
Jessica Moffatt	IMAWG
Lauren Weir	DFO
Teri Roley	DFO
Timothy Healy	DFO
Nicole Trouton	DFO
Howie Wright	HFS

Appendix 4: Detailed Group Technical Proposals

Group 1: Tools and Technology

- Classification: LCA, TEK, resources, use case recovery step
- Catherine Clark Murray, Lisa Mahon, Helen Pettigrew
- Need to make sure the guidance is practical for practitioners.
- Need to make sure the tools connect to an agreed-upon “step” for recovery.
- Tools
 - Those that exist
 - Those that exist in other places
 - those that don't exist/are needed.

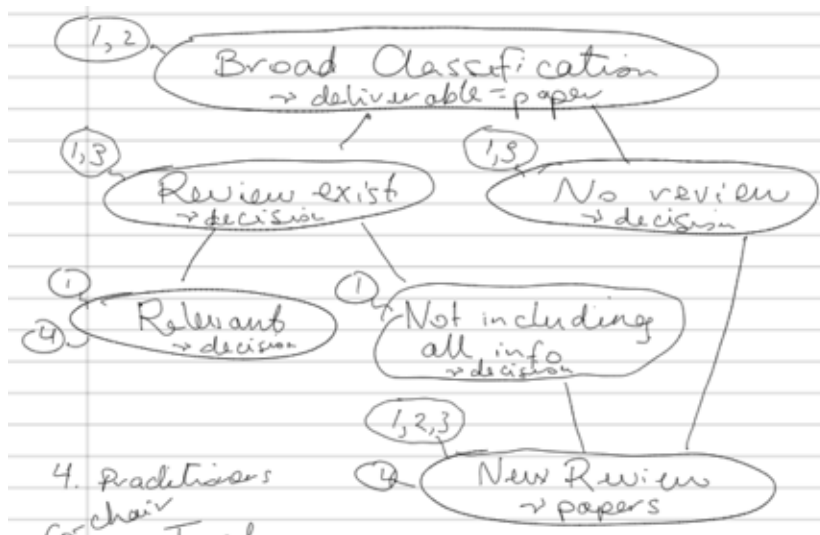
Objective

- How to help salmon? Let's sift through the toolbox! Tools and models, analytical approach.
- We need to empower recovery teams with guidance on which tools to use and when/where is appropriate.
- Tools can help us understand how yield, hydrological pattern, cumulative effects, multi-species interactions, flood plain alteration, equivalent clearcut areas.

Baseline

- There are a lot of tools (models and analytical approaches) available to help identify and prioritize salmon conservation actions.
- It's not clear when along a recovery process it is appropriate to use different tools and why to choose one tool over another -> show recovery cycle.

Options



- Describe process for existing models, plus new to BC and new models.

Engage

1. Technical Task force: FN, DFO, ECCC, BC, Academia
2. Model experts: Beechie/Jorgensen/Lowe, Martin, Bayly, Benda (NETMA)
3. Staff, post docs, from Technical Task Force, FSMC
4. Practitioners

OBOES

- What reviews have already taken place?
- What is the scope of the models to include?

Process

1. Large typology/classification - which models exist?

Broad: To define apples and oranges.

2. For each class: (short term)

a) does a review already exist?

Or does it need to be bolstered

which the “standard ToC”

b) If the review doesn't exist, use the standard ToC to define.

- Though the classification scheme needs to be flexible to explain all the different model uses.
- Need a process to track tool development like Tom Bird's [MR.org](#) (med term)
- CSAS for tools that are being adapted (long term)
- Process to develop new tools.

Support:

- Professional cat herder, technical and relevant experts
- Buy in and it falls under scope
 - Both operational and management <- logistics
 - Jason Hwang, Richard Bailey, Jordan Rosenfeld, Astrid and Jansen Wong.
- Need to seek guidance from FN groups and how science interacts <- governance needs to be in place to support.

Next steps

- Cat herders need to connect, agree and get management buy in
- Cat herders need to reach out to technical team with a plan, then engage experts.
- Scope classification at a technical meeting -> allocate work to staff/partners.

Group 2 | Data Visualizer

(Notes in PPT format - See Link/attachment)

Group 3 | Integrating the 4 Hs

Statements we know to be true:

Need more coordination between the pillars. Coordination and joint planning that thinks about management, hatcheries, restoration planning including planning for hydrological recovery, habitat protections.

Need a more watershed based approach but also need structures that can consider the whole salmon life cycle - fisheries, marine areas, migration routes

Maybe even bigger - what is needed for whole ecosystems (elk, bears, fish) true ecosystem recovery. If you fix the ecosystem the rest will take care of itself. Overlap in protections/safeguards should be no brainers - but needs coordination across jurisdictions and species experts

No progress without proper governance, good data, prioritization

Need to think differently - outside the box. Past work that looks a lot like what we are discussing in many circles today, failed. Why?

Change needs to be managed properly

Ideas on Governance

Governance and technical tables need to happen at multiple levels.

FSMC, First Nations governments, DFO, Provincial, Municipal, International (treaty level?)

Regional level planning

Regional tables - tripartite body - **agreement and commitment from senior levels** and that will drive the process. That will access the funding. overseeing group that agrees we have issues and agrees on what they are. Sets priorities for most important things that need to addressed. Fisheries management, Hatcheries. Needs to be agreement on key areas of work, spatially?, tool development, priority setting, methods for benchmarks.

- IFMP coordinates on federal level - what about BC jurisdictions? Water management, forestry is outside of fed jurisdictions. It can be done (e.g. Nechako)
- Salmon Treaty level bilateral (Indigenous and Federal) discussions
- Discussion on how funding would flow,
- Structures that empower watersheds
- FNFC could model a more regional body
- Cross communication between hatchery and RM decision makers
- Instead of an IFMP migrate to a more holistic 4H integrated salmon management plan. Pilot it. How do you move to a more community based plan?
- Promote regulations to improve outcomes for fish with regard to
 - Water use?
 - Forestry practices?
 - Linear practices?

Subregional tables -

- Overall, a secretariat group on Fraser Chinook and 5 key themes, habitat, harvest, hydrological, hatchery and health (salmon) - Under each theme -process to prioritize areas, immediate action items, what is being done

- Use existing structures - Fraser Salmon Management Council/ FSMB (eg or sub regional governance?- talk about more than Harvest, bring in all 4Hs to conversation?

- Build support governance structures at sub regional and regional level to address funding, regulations, laws, policy._

Watershed and population/ deme level work (Habitat, Hydrology, Hatcheries, terminal harvest)?

1. To get them set up - Indigenous lead discussion on spatial recovery table aggregates
2. Need to be responsive to prioritization work at other levels of planning.
3. Need to work at different temporal scales – immediate, mid term and long term recovery horizons.
4. tripartite tables need to have the right people in the right roles (fed, Indigenous, BC, municipal) technical capacity.
5. Would have to balance technical capacity, TEK/IK, other capacity, funding?
 - a. Who should be there and when (NGOs, industry)
 2. What authorities would they bring to the table, what knowledge, what capacity.
 3. Clarify Roles and Responsibilities
5. Model for process?
 - a) Agree on values for watersheds/species - consider a multi value, true ecosystem approach
 - b) Gather data and tools that are available, gap assessments, (all types of data/info - indigenous knowledge, western science, etc.)
 - a. Spatial data, Lidar, orthophotography, GIS, satellite, etc.
 - b. Habitat needs for each species and life stage
 - c. Hydrological
 - d. Life histories
 - e. Stock profile/narrative
 - f. Abundance
 - g. Timing
 - h. Escapement Trends
 - i. Distribution Modeling
 - j. Land value/Land use
 - k. Climate change
 - l. Cumulative impacts
 - m. Hydrology - flows, depths, timing
 - n. All impacts along migration route - PIT tag programs, radio tagging, barriers

- c) Determine what are the recovery objectives, performance metrics, what does success look like
- d) Determine limiting factors and threats/pressures
- e) Determine what actions you could take to address threats - evaluate trade offs, explore all actions then determine what actions to undertake, don't limit early, think big and put everything on the table.
- f) Implement actions
- g) Monitor
- h) Rinse and repeat. Iterative, and adaptive management

6. Activities to be considered at a watershed level planning table

First ensure no harm and that activities conducted without full information (low hanging fruit, no brainer, triage work) is conducted in a way that can be reversed if necessary.

- Habitat:
 - Prioritizing intact areas for protection
 - habitat restoration prioritization.
 - Stop development in the floodplain
 - Change zoning in floodplain to passive use only
 - Develop Pacific salmon specific best mgmt practices
 - Ecologically functioning stream crossings
 - Riparian protection
 - Restoring connectivity
 - Do no harm - Research to make sure we are doing only good, adaptive management (actions need to be reversible)
 - Develop an ecosystem-based approach to evaluating the status of the habitat/ ecosystem health - considering a broad spectrum of indicators.
- Hatcheries:
 - input into hatchery planning at watershed level.
 - What can hatcheries do from a conservation perspective for watershed.
 - influence hatchery planning cycle with watershed level needs.
 - establish priorities, Spring 42, Spring and Summer 52 triage, emphasis on conservation triage. Plan for emergency events
- Harvest
 - again use regional priority work to develop hatchery planning in watersheds-
 - refer to different group- Integrated all-H Salmon Management Plan.
- Hydrology - recommendations for regulation and policy change to influence land use decisions that impact hydrology
- Fish health

Other considerations:

- 1) Build on existing protections
 - 2) What are habitat indicators - flow and temperature, drought and trib temp should be consider when making fisheries management decisions
 - 3) Organize info you already have - this can provide clues to what you need and how to prioritize those H's
 - 4) Then organize by area (bio geographic) and Fraser chinook stocks - smallest aggregate would be to spawning tributary (eg Bessette, Little Shu, Salmon).
 - 5) Go to the Indigenous groups and ask at what aggregate the watershed recovery tables would need to happen. Would have to balance technical capacity, other capacity, funding?
- 1) Better management for fish during drought - benefits greatly from information, with flow and fish use ONA, BC have been successful at getting protection orders implemented.
 - 2) Need info to get things off the ground.
 - 3) More focused on truly ecosystem based approach. More holistic on who we engage and how we engage.

Why didn't past attempts work -

Disagreement on basic data -

not easy things to resolve, fraser chinook issues within SMB - have a dispute resolution board to review harvest rate on Summer 52s. Data not great but it's what we have. Need to have the info to inform the discussion so you can get to the recommendation - without the data it's really difficult. May have to fall back on dispute resolution bodies.

Defaulting precautionary principle?

Time needs to be spent on whatever is available - identifying gaps and how to deal with them. Do that early in the process so you're not derailing progress in later stages

2. Developing limit reference points for Chinook in Fraser. We have habitat reference points but argument is they are outdated.
3. Think about TEK - how do we incorporate this better
 - "Two-eyed seeing" - putting TEK and western science on equal footing, recognizing that they are complementarity if different in some ways
4. Water level data/ temperature data - when will that be considered in management.

Political Interference

All of the parties agree on issues, objectives and end points.

Get director/ Chief level structure in place - then they should be able to deal with interference as it comes.

Not always fish first. - so that should be implicit in the initial of phase of multilateral agreement. Identify key principles at the outset.

Have to be clear on objectives, solutions, actions, etc. and have clear consequences front and centre if actions are not taken - if made consequences are public it is harder to not answer to

Lack of funding

- Each of the parties should contribute
- G&C flexibility
- Being creative in consolidating funds - federal govt working together not just within their individual departments
- Explore ways to have long term funding - stop the March madness and fund entire processes/projects/etc. over multiple years

Past practices have not been inclusive enough -

multi disciplinary, multi government, multi representational is better.

Too worried about perfect data or perfect solution - can sometimes paralyze decisions

Opposing parties start to become positional due to lack of data

- Eg Trajectories - arguments over trends in data - is it real or an artifact of analysis?
- Monitoring and adaptive mgmt

Precautionary principle - In the absence of perfect data we should error on the side of caution

- Evaluation of data gaps and actioning important data series.
-

Recommendations

Need to establish a governance process that includes the key parties, Federal, Provincial, First Nations etc and regional bodies.

Out of box thinking - what would be solutions to the problems we have seem in the past - ideas to try, pilot or change.

what if we put fish first, examine the authorities and determine how they affect fish. Are they causing harm, why and how to change them?

Feedback

OBOES exercise: Objective: Integrating the 4H's to achieve salmon restoration:

- What are some important milestones that need to be achieved on the way to that headline success story?
 - Habitat:
 - Prioritizing intact areas for protection
 - habitat restoration.
 - Stop development in the floodplain
 - Change zoning in floodplain to passive use only

- Develop Pacific salmon specific best mgmt practices
 - Ecologically functioning stream crossings
 - Riparian protection
- Restoring connectivity
- Do no harm - Research to make sure we are doing only good, adaptive management (actions need to be reversible)
- Hatcheries: establish priorities, Spring 42, Spring and Summer 52 triage, emphasis on conservation triage. Plan for emergency events
 - Do no harm
 - Plan for the long term (cryo?)
 - Plan for genetics
 - Plan for geographic distribution
- Harvest - again use priorities - refer to different group- Integrated all-H Salmon Management Plan.
- Hydrology
- Fish health

Information we need - should be established right away. Need consistent funding to develop long term data sets to inform better decision making.

Spawning timing

Spatial distribution

Abundance

Hydrology - flows, depths, timing

All impacts along migration route - PIT tag programs, radio tagging, barriers

Need more coordination between the pillars.

Coordination

1. Joint document that thinks about management, hatcheries, restoration planning including planning for hydrological recovery, habitat protections.
2. Use a watershed based approach
3. Build on existing protections
4. What are habitat indicators - flow and temperature, drought and trib temp to consider management levers
5. IFMP coordinates on federal level - what about BC jurisdictions? Water management, forestry is outside of fed jurisdictions. It can be done (e.g. Nechako)
6. Organize info you already have - this can provide clues to what you need and how to prioritize those H's

7. Overall, a secretariat group on Fraser chinook and 5 key themes, habitat, harvest, hydrological, hatchery and health (salmon) - Under each theme -process to prioritize areas, immediate action items, what is being done
8. Then organize by area (bio geographic) and Fraser chinook stocks - smallest aggregate would be to spawning tributary (eg Bessette, Little Shu, Salmon).
9. Go to the Indigenous groups and ask at what aggregate the watershed recovery tables would need to happen. Would have to balance technical capacity, other capacity, funding?
- 10.
11. Where would salmon treaty level decisions would come in?
12. What is needed for whole ecosystems (elk, bears, fish) true ecosystem recovery. If you fix the ecosystem the rest will take care of itself. Overlap in protections/safeguards should be no brainers - but needs coordination across jurisdictions and species experts

Step by step

Develop an ecosystem-based approach to evaluating the status of the habitat/ecosystem health - considering a broad spectrum of indicators.

Species and watershed level work (Habitat, Hydrology, Hatcheries)?

1. Go to the Indigenous groups and ask at what aggregate the tripartite tables need to (fed, Indigenous, BC, municipal), watershed recovery tables would need to happen. Would have to balance technical capacity, TEK/IK, other capacity, funding?
 - a. Who should be there and when (NGOs, industry)
 - b. what
2. Gather data and tools that are available, gap assessments, (all types of data/info - indigenous knowledge, western science, etc.)
 - a. Spatial data, Lidar, orthophotography, GIS, satellite, etc.
 - b. Habitat needs for each species and life stage
 - c. Hydrological
 - d. Life histories
 - e. Stock profile/narrative
 - i. Abundance
 - ii. Timing
 - iii. Escapement
 - iv. Trends
 - v. Distribution
 - f. Modeling
 - g. Land value/Land use

- h. Climate change
 - i. Cumulative impacts
 - j.
3. Agree on data and values for watersheds/species
 4. Complete gap analysis and develop plan to address gaps
 5. Determine what are the recovery objectives, performance metrics, what does success look like
 6. Determine limiting factors and threats/pressures
 7. Determine what actions you could take to address threats - evaluate trade offs, explore all actions then determine what actions to undertake, don't limit early, think big and put everything on the table.
 8. Implement actions
 - a. Restore lateral and longitudinal connectivity
 - b. Restore ecological functions
 - c. Prioritizing intact areas for protection
 - d. habitat restoration.
 - e. Stop development in the floodplain
 - f. Change zoning in floodplain to passive use only
 - g. Develop Pacific salmon specific best mgmt practices
 - i. Ecologically functioning stream crossings
 - ii. Riparian protection
 - iii. Bioengineering
 - iv. Water mgmt plans for all salmon streams
 - h. Restoring connectivity
 - i. Do no harm - Research to make sure we are doing only good, adaptive management (actions need to be reversible)
 - j. Monetary incentives or disincentives for landowners on salmon streams
 9. Monitor
 10. Rinse and repeat. Iterative, and adaptive management
 1. Build support governance structures at sub regional and regional level to address funding, regulations, laws, policy.

More discussion on how funding would flow, need structures that empower watersheds

Need structures that can consider the whole salmon life cycle - fisheries, marine areas

Action list:

- Ensure actions do not cause irreversible harm

Regional tables - tripartite body - **agreement and commitment from senior levels** and that will drive the process. That will access the funding. overseeing group that agrees we have issues and agrees on what they are. Sets priorities for most important things that need to be addressed. Fisheries management, Hatcheries. Needs to be agreement on key areas of work, spatially?, tool development, priority setting, methods for benchmarks.

Watershed tables have failed in the past but have they been true planning tables with the right people

Water use?

Forestry practices?

Linear practices?

Cross communication between hatchery and RM decision makers

Instead of an IFMP migrate to a more holistic 4H integrated salmon management plan. Pilot it. How do you move to a more community based plan?

Use existing structures - Fraser Salmon Management Council/ FSMB (eg or sub regional governance?- talk about more than Harvest, bring in all 4H conversations?

FNFC perhaps a more regional body

Manage change!

Better management for fish during drought - benefits greatly from information, with flow and fish use ONA, BC have been successful at getting protection orders implemented.

Need info to get things off the ground.

More focused on truly ecosystem based approach. More holistic on who we engage and how we engage.

Why didn't past attempts work -

1. Disagreement on basic data - not easy things to resolve, fraser chinook issues within SMB - have a dispute resolution board to review harvest rate on Summer 52s. Data not great but it's what we have. Need to have the info to inform the discussion so you can get to the recommendation - without the data it's really difficult. May have to fall back on dispute resolution bodies. What about precautionary principle?

2. Developing limit reference points for Chinook in Fraser. We have habitat reference points but argument is they are outdated.
3. Think about TEK - how do we incorporate this better
4. Water level data/ temperature data - when will that be considered in management.

Out of box thinking - what would be solutions to the problems we have seen in the past - ideas to try, pilot or change.

what if we put fish first, examine the authorities and determine how they affect fish. Are they causing harm, why and how to change them?

Feedback - group 1 - Alston et al

- Too complicated a pitch
- IFMP is an easy way into this problem - it's a known quantity, could expand on that. It's tangible.
- Is outcome IFMP or governance structure?
- Is governance spatial or built around 4Hs

Baseline: *"It is important that we know where we come from, because if you do not know where you come from, then you don't know where you are, and if you don't know where you are, you don't know where you're going. And if you don't know where you're going, you're probably going wrong."* - Terry Pratchett, *I Shall Wear Midnight*

Group 4 | Climate Change Scenarios

Objective

- Climate change is driving the need for a radical approach
- Aiming to reduce vulnerability of salmon ecosystems to climate change

Milestones

- Understanding Fr Chinook vulnerability to climate change — assessment + monitoring and vision.
 - How bad is the problem? What can we affect?
- Making it everyone's problem — all users understand and are on board to make change, don't think it's a lost cause.
- Longevity of programming — keep up the momentum.
- Linking to larger processes — everyone needs to be held accountable; bigger consequences.
- Communication/outreach strategy — where are the influence nodes we can push to make change?

Baseline

- What have you tried so far that worked?
 - Climate change projections of how habitat will change.
 - Indigenous groups establishing protected areas.
 - PSF focussing more on recovery of salmon, less on people (is it creating the results?)
 - Applied RAMS process to marine environment on West Coast — pulls in climate projections (50 years).
 - PSF and Long Live the Kings — Pacific Coast salmon climate change initiative
- What have you tried so far that didn't work?
 - Very reactionary - short term solutions.
 - No one is working on it together - redundancy, opposing objectives.
 - Single species approach — silo'd
 - Don't base actions on current conditions — things will change, can't mitigate rare events.
 - Pulling one lever — e.g. harvest, habitat, hatchery, hydrology.
- What needs to stay? What needs to go? What needs to be worked around?
 - Scenario planning: bring experts together to narrow down potential future scenarios;
 - Thinking realistically about the future, what are the solutions?
 - Bring in different thinkers, e.g. sociologists)
- Remove institutional baggage, set aside egos.
- Honest and consistent messaging; how do you change the story at the top.

Options

1. Structured workshop(s) — bring everyone together to construct a story about plausible future scenarios and solutions. Regional focus. Show success stories. Something like this may be in progress (PSF/LLTK).
2. Developing a framework for understanding impacts and implementing solutions — multi-step process; includes communications and engagement plan.

Defining what recovery means in a climate-focussed context.

Obj. alignment on what we're talking about — what do we want to recover to? What does the future look like? What are the objectives in terms of biodiversity, social, FSC, etc? What kind of future are you comfortable with? -> ranking objectives.

Engage

- Who needs to be involved?
 - Sarah Murdoch (PSSI - later
- Who needs to make decisions?
 - Collaborative
- Who do you need on the technical and/or implementation team?
 - Skills/Positions:
 - Core coordinator (needs funding; innovative, strategic thinking, planning skills)

- DFO reps)
-)Creative, not constrained, understanding of CC, motivation, tech backgr
- FSMC reps)
- Bilateral planning group to set up/implement - Steering Group. Expand down the road , once problems defined -> assign as part of action plan.
 - Re-align job duties within existing positions.
- Who needs to be engaged/involved
 - ECCC
 - Presentation to the Standing Committee on Fisheries and Oceans
 - SFAB, ENGOs, etc
 - Province of BC
- Influencers
 - FSMB
 - Leaders need to stay in the conferences/workshops and get engaged.

Support

- Technical “winning” conditions
 - Facilitated by specialists in scenario planning (consultants)
 - Team to pull together info/data/inputs to support scenario development
 - Mechanism for rapid implementation of solutions.
- Logistical “winning conditions”
 - Long-term funding
 - Making sure the right people are there to inform. Biologists, managers but also social scientists and other thinkers.
 - ID “champions” to carry work forward.
 - Where to get funding to implement solutions.
- Governance “winning conditions”
 - Clear objectives developed together
 - Leaders need to listen and support the message.
 - Established roles and responsibilities.

Feedback

- What’s the implementation plan?
- How does it touch the fish? How does it touch the community? What’s the product?
- ID funding for implementation up front before you have the workshops — e.g. get funding, put it in savings and spend once you have a plan.
- Dynamics of CC — rapid change.
- How will you make it accessible, assess impact on fish?
- Are the implementation plans working? Annual assessment of methodologies. Adaptive to variations.

- Be realistic about pace of change. Rapid assessment process - current systems move too slow.
- Plan to be reactive faster:
 - Success story: Big Bar; trilateral partnership; get around the red tape
- Getting the right info to the right people
- Other group is looking at ecosystem-informed assessment.
 - Ours is focussed on developing the planning framework
 - Action plan, team to oversee implementation
- Outcomes:
 - Plausible scenarios - narratives - for Fraser salmon - layer on problems: are our existing processes robust to these future scenarios? If not, then what?
 - Solution space - deconstructing institutions, SARA
 - Common vision of future — ID what won't work going forward.

What scenarios?

- Critical uncertainties - what's plausible? e.g. habitat in S. latitudes in BC uninhabitable for CN, only high latitude habitats can sustain.
- Prioritization: What's most important?
- How do these scenarios link back to chinook making more chinook — e.g. what does it mean if you lose half the ice sheet (doesn't just affect fish)
- Focus on the management levers we have: water use management, harvest management, habitat.
 - migration timing
 - water use plan, options for flow control
- what are the vulnerabilities in our systems?
- Making the link to what you can control
 - conserve - adaptive chars
 - - habitat protection - ecologically significant areas.
- Looking at California for what might be the future here — shows possible to mitigate if early intervention.
- How do we create conditions for Chinook to adapt to future scenarios?

Group 5 | Life History/Ecosystem Informed Assessment

Members: Alston Bonamis, Chantelle Caron, David Patterson, Cam Freshwater, Shamus Curtis, Diana Dobson, Eric Hertz, Rachel Hornsbey and Lauren Weir

OBJECTIVE:

Ecosystem and Life History Informed Assessments to provide more comprehensive advice to inform the broader management context (i.e. ecosystem, climate informed). (Expand basis of stock assessment from fishery focus to broader ecosystem context, including climate change).

Components:

- Use a life history assessment approach with environmental variables (Move from simple life history model / assessments (e.g. RAMS to more complex, more informed models, sensitivity analysis to identify key data gaps)
- Through enhanced monitoring collect additional information to validate model assumptions, recommendations, fill data gaps (intensive / extensive model)
- Long-term data sets, expanded monitoring allows to understand impacts of climate change
- Collaborative and cooperative delivery required
- Guidance for standards (monitoring, meta-data)

BASELINE:

Where are we coming from? Fisheries centric moving towards ecosystem centric

Would need to complete an assessment of what data we have currently to populate a life history model and identify gaps. Tables of values started below, but not completed.

Life History Stage

Life History Stage	Mortality (Abundance)	Demographic Parameters	Spatial/ Temporal Distribution (Use of Habitat)	Biological Information	Environmental
Spawning					
Egg to Fry					
Fry / Overwinter					
Smolt					
Early Marine					
Rearing					
Return Marine Migration					
Return FW Migration					

- Decent spawner estimates, marine survival estimates, fishery mortality estimates for some populations
- Upstream migration timing to Albion, some emerging information from Big Bar work, gaps for early timed Chinook
- Gaps in fecundity, size

- Spawning success?
- Egg to fry survival
- Fry to smolt, overwinter
- Marine survival
- Fishing mortality
- Upstream Migration

Demographic parameters: Fecundity,
Spatial Temporal Distribution

Life History Stage	Timing	Habitat/Ecosystem
Spawning		
Egg to Fry		
Fry / Overwinter		
Smolt		
Early Marine		
Rearing		
Return Marine Migration		

OPTIONS:

Enhance ecosystem based assessments:

Intensively monitored watersheds and increased environmental monitoring

Need to consider representation / priorities

- Freshwater: What stocks/watersheds to monitor? Prioritize?
- How to link to marine monitoring? (oceanography, juvenile surveys, high-seas surveys) – maybe more about synthesis than additional data
- Might consider monitoring healthy stocks (more data, stocks of the future?)

Coordinated assessment and monitoring framework

Management context: not just FM, but SEP, FFHPP, SARP

Steps:

1. Endorsement – from Senior Managers (DFO, PSF, PSC, FSMC)
2. Establish a Steering Group...FSMC/DFO
3. Workshop 1:
 - include high level RAMS (stream-type and an ocean type)
 - Scientific scoping to develop a framework... (inc. fresh/marine)

identify opportunities, constraints – requirements to do this work
Engage: Nations, DFO Science (Freshwater, Marine, STAD), PSF, PSC, Province, Academics)

4. Workshop 2: Involve 'clients' – develop business case, identify opportunities, strategies for funding, etc.
Engage Province, other Groups

ENGAGEMENT:

- First Nation Communities identify priorities... what are the prioritization criteria?
- Province
- Regional Districts / Municipalities –
- Tier 3
- PSF
- ENGOs

SUPPORT:

- Scientific scoping
- Data management system
- DFO Branches – Managerial Support (Endorsement)

FEEDBACK:

Notes - Round 1:

- Funding – why is this different than WSP Strategy 4 – need to consider what went wrong
 - Response:
 - Not very different we didn't implement it well enough or at all
 - An iterative way of learning with climate change otherwise we don't have a mechanistic understanding
 - Principles of wild salmon policy still make sense, but this is taking it a step further and pivoting to implementation for management
- Mobilize existing information – inventory prior to workshop (agreement that we had gaps, couldn't identify gaps with Sockeye)
 - Response: Can pre-populate to help with this
- Inputs – how much work is required prior in relation to above
 - Response: This would consume some time and resources, but it would be worthwhile to make sure the workshop is productive and prevent the replication of previous work
- Application – worry about getting lost in the weeds...
 - Response: If you want to prescribe detailed habitat restoration you need to get into the weeds.

Notes - Round 2:

- Excellent idea! Loved it!
- Liked the intensive versus extensive as it was a better use of resources

- Asked about possible issues on data disagreements. What if people don't agree on the usability of the data or the values or how it was collected?
 - Response:
 - Hopefully by having everyone at the table for initially identifying the parameter values, the key gaps and coming up with the assessment methods that we would be able to reach consensus. Then we could also have these discussions via the steering group to address any data issues that come up later.
 - Could also provide outreach to the groups using the data so they understand the data and have opportunities for feedback