YUKON RIVER CHINOOK REBUILDING PLAN EFFORTS IN CANADA

Yukon River Panel Meeting – Closed Session
Anchorage, Alaska
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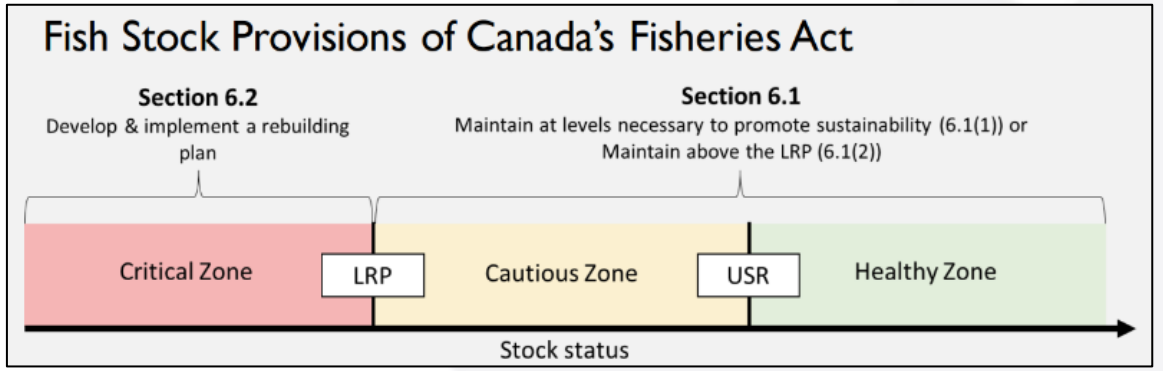
CANADIAN REQUIREMENTS for DEVELOPMENT of a YUKON RIVER CHINOOK REBUILDING PLAN

- Pacific Salmon Strategy (PSSI)
  - Yukon River Chinook; 1 of 4 priority salmon stocks under the PSSI requiring stock rebuilding plans.
  - Yukon River; 1 of 3 watersheds identified for the development of an ecosystem plan.
- Fisheries Act – Fish Stock Provisions
  - Yukon River Chinook are soon expected to be listed as a "Major Stock" under legislation in Canada.
  - Listing requires measures to maintain stocks at sustainable levels.
  - Development of a stock rebuilding plan is required if abundance is below threshold.



PROCESS for DEVELOPING & IMPLEMENTING a STOCK REBUILDING PLAN

1. **Set objectives.**
2. **Inventory and assess population and ecosystem status and trends.**
3. **Identify (a) problems and (b) all potential actions.**
4. **Review and select appropriate actions.**
5. **Prioritize Actions.**
6. **Design actions and monitor.**
7. **Implement actions and monitoring.**
8. **Evaluate (monitoring) data.**
9. **Adjust goals and/or actions.**

Source: Chrissy Czembor (DFO), RAMS paper (in-prep), adapted from Roni and Beechie (2013) and aligns with the Conservation Measures Partnership's Open Standards for the Practice of Conservation.

WORKSHOP 1: November 23-24, 2023

- Facilitated by West Coast Aquatic, a non-profit organization from Vancouver Island with no previous history in Yukon but extensive experience working with BC First Nations on salmon stock rebuilding processes.
- Participants included: most Yukon First Nations, Yukon Government, Fisheries and Oceans Canada, Yukon First Nation Salmon Stewardship Alliance, Yukon Salmon Sub-committee and a couple *member emeritus*.

WORKSHOP 1: November 23-24, 2023

- Confirmed with participants the drivers and need for a stock rebuilding plan for Yukon River Chinook.
- Reviewed preliminary status of Yukon River Chinook and Ecosystem.
- Commitment to a collaborative process.
- Identified the need to “Act while planning” and to put salmon first!

WORKSHOP 1: November 23-24, 2023

Set objectives for a stock rebuilding plan.

- Self-sustaining and resilient salmon population.
- More salmon on spawning grounds.
- Ecosystem integrity.
- Relationships with salmon continue.
- Salmon continue to support culture, food and knowledge transfer.

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WORKSHOP 1: November 23-24, 2023

Presentation by Brendan Connors (DFO) on status and trends of Yukon River Chinook.

- Run size declines.
- Declines in productivity.
- Sub-stock dynamics.
- Environmental and ecosystem changes related to productivity (Murdock et al.).
- Parental spawning migration drivers; high water temps/heat stress, poor marine food quality (Howard and Von Biela).
- Declines in escapement quality (Connors et al.).

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WORKSHOP 2 March 26 & 27, 2024

Preparations:

- Draft document produced, "Issues Facing Salmon"; authoured by Al von Finster and Alyssa Murdoch.
- Document being reviewed by Brendan Connors (DFO) and Kate Howard (ADFG).
- Issues analyzed using "Risk Assessment Methodology for Salmon" (RAMS)… (more)

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POTENTIAL TOOLS for ACTIONS

The actions available to influence salmon productivity are generally related to:

- Fishery management actions: modify the quantity and quality of fish allowed to pass through the fishery.
- Hatchery inputs: based on hatchery objectives – increase production, support restoration or conservation of stocks, and support scientific understanding (tracking marked fish through the population).
- Habitat restoration: actions to restore habitat types when lack of habitat is limiting production. Habitat maintenance: ensuring availability and quality of habitat when production returns.

Fishery Management

Hatchery & Enhancement

Habitat Restoration

SOME TOOLS FOR IDENTIFYING ISSUES AND SELECTING APPROPRIATE ACTION

Qualitative/ semi-quantitative

Quantitative-deterministic

Quantitative-stochastic

Risk Assessment Methodology for Salmon, RAMS

All-H-Analyzer, AHA

DFO hatchery dynamics model

samSim

Age-specific Chinook exploitation rate model (ECVI)

salmonMSE

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We used RAMS process to identify issues.

- Allows for inclusion of other knowledge, including Traditional Knowledge.
- Works in both data "rich" and data "poor" situations.
- Assess 105 known limiting factors through all stages of the salmon life cycle.
- Considers likelihood and magnitude of impact (risk to salmon).
- Actions to mitigate impacts can include the full spectrum of potential "levers".
- Allows for repeat analysis: changes in threats or risks, improved data, and effectiveness of actions.

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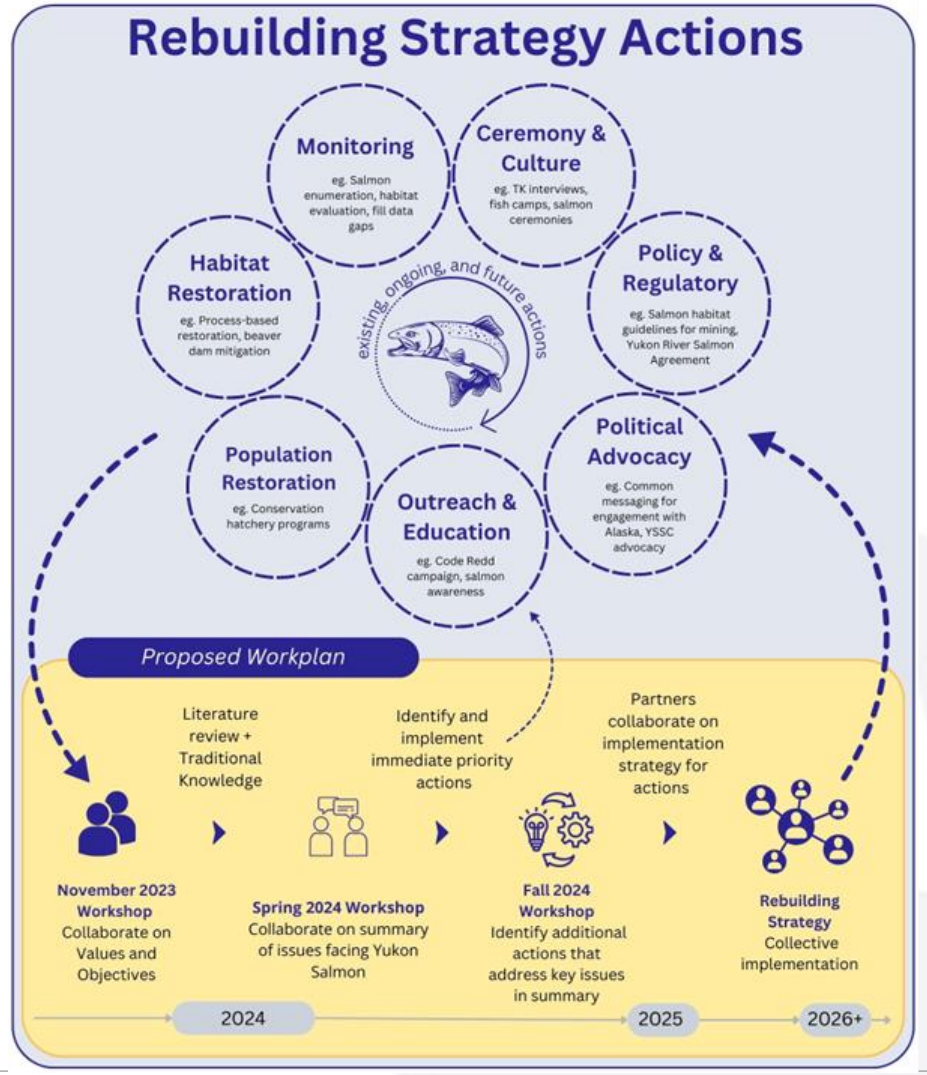
CANADIAN YUKON RIVER CHINOOK PROCESS

Actions for Canadian Yukon River Chinook include:

- Ceremony & Culture
- Monitoring
- Habitat Restoration
- Population Restoration
- Outreach & Education
- Political Advocacy
- Policy & Regulation



OTHER PROCESSES USING "RAMS"

Risk Assessment Methodology for Salmon has also been used in the following salmon stock rebuilding planning processes in Canada:

- West Coast Vancouver Island Chinook salmon
  - Status: in progress, confirming threat risk status.
- Nanaimo Chinook salmon
  - RAMS component complete.
- Okanagan Chinook salmon
  - Complete, rebuilding plan pending final approval.

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- Reviewed "Issues Facing Salmon" outcomes.
- Used as the foundation for discussion and development of potential actions.

	Freshwater		Ocean				Freshwater
Issue Category	**Egg / Alevin**	**Fry and Smolt**	**Smolt (Ocean)**	**Juvenile**	**Immature**	**Maturing Adult**	**Returning Spawner**
Fishing (bycatch and targeted harvest)	N/A	N/A	N/A	N/A	Very Low / Data Gap	Very Low / Data Gap	Very Low
Warming Temperatures	Low-Moderate	Low-Moderate	Moderate	Moderate	Data Gap	High	High
Competition	Very Low	Very Low	Data Gap	Data Gap	High	High	Very Low
Icthyophonus	Very Low	Very Low	N/A	N/A	Data Gap	Data Gap	High
Predation	Very Low	Low-Moderate	High	High	Moderate	Moderate	Low
Habitat Degradation or Loss	Low-Moderate	Low-Moderate	Data Gap	Data Gap	Data Gap	Data Gap	Low
Water Quality (not including temperature)	Very Low-Low	Very Low-Low	N/A	N/A	N/A	N/A	Very Low
Hydrology	Low-Moderate	Very Low	N/A	N/A	N/A	N/A	Low-Moderate
Hydroelectric Dam Impacts (localized)	N/A	Very High	N/A	N/A	N/A	N/A	Very High
Demographic / Escapement Quality	N/A	N/A	N/A	N/A	N/A	N/A	High
Genetic Issues	Data Gap	Data Gap	Data Gap	Data Gap	Data Gap	Data Gap	Data Gap

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- Presentation on creating space for Traditional Knowledge
  - Indigenous indicators of success
    - Relationship with salmon
    - Youth in fish camp with elders, cultural and traditional practices
    - Ceremony (needed to call them back)
    - Salmon on the spawning grounds
  - Developing relationships and trust between western scientists and Traditional Knowledge holders
  - Giving equal resourcing as western science

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Action Development:

- High Temperatures (Adult Migration)
  - Collaboratively develop a standardized temperature monitoring program.
  - Store data on Pacific Salmon Foundation's "Datastream".
  - Take advantage of the many existing assessment and monitoring projects.
  - Consider it from the fish. What is the appropriate metric (daily maximum temperature, daily average, or some combination of duration and temperature).

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Action Development:

- Overwintering Habitat Data Gap
  - First step in understanding threats to overwintering habitat is to quantify the extent of habitat.
  - Work collaboratively to design a study for confirming the extent of juvenile Chinook salmon overwintering habitat.
  - Explore the use of eDNA as first presence/absence indicator. Pilot trial study for 2024-25.
  - Valuable for future protection.
  - Need to identify habitat parameters as presence/absence may be limited during low abundance.

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Action Development:

- Ocean Hatchery Impacts
  - Strong correlation between number of pink salmon in North Pacific and low return of Yukon River Chinook salmon.
  - 15% of pink salmon are hatchery origin.
  - 4.5 Billion hatchery salmon in North Pacific annually; 40% of salmon are hatchery origin.
  - Group identified to understand North Pacific fishery governance and measures in place to protect wild Yukon River Chinook.
  - Advocate for the protection of Yukon River Chinook salmon.

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Action Development:

- Increased Public Profile of Salmon
  - During times of low abundance and lack of direct interaction with salmon through harvest and traditions, staying connected to salmon is critical.
  - People need to care about salmon and value their place on the landscape.
  - A number of people/organizations identified to foster stewardship, develop activities and celebrations.
  - Includes, but goes beyond First Nation culture and traditions to broader public participation.

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Action Development:

- Improved Regulatory Regime
  - Requirement for adequate baseline data prior to development.
  - Protection of riparian habitat important to Chinook salmon
    - Industrial development & Yukon Placer Authorization overhaul.
  - Protection of habitat upslope from rivers & streams.
    - Industrial development and effective reclamation.
  - More stringent reclamation standards.
- Stringent conditions for hydro dams.
  - Requirements for effective fish passage upstream and downstream.

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Next Steps:

- Group identified to review threats document.
- Space for Traditional Knowledge.
- Steering/Organizing Committee confirmed.
- Fall workshop:
  - Review and finalize threats.
  - Develop appropriate actions.
  - Explore prioritization process for actions.
  - Explore framework for "plan" or "strategy" document.

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Questions