Towards Integrating Ecosystem Function in the Columbia River Treaty

CBRAC Meeting
October 9, 2019
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Outline

- Background
- Draft EF goals
- Next steps
- Importance of flexibility in the CRT to implement ecosystem function
- Brief Q&A
- Discussion groups

Syilx and Ecosystem Function

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Water is our relation.

Water bonds us to our ancestry, our descendants and our land.

Water must be treated with reverence and respect.

Our relationship with water is not taken lightly, we are responsible to ensure that our relation can continue to maintain the health and resiliency of our land and animals.

Water is the lifeblood of our land and our animals and we as Syilx people.

Recognize water as a sacred entity and relative that connects all life.

Water comes in many forms and all are needed for the health of land and for the animals.

Water is our most sacred medicine, water nourishes, replenishes, cleanses and heals.

Any use of water should be an act of reverence and a commitment to our responsibilities.

Of all life. Now and to come, as *Syilx* people.

Water comes from the sky and the highest place yet it never willfully rises above anything.

It will always take the lowest path in its humility. Yet of all the elements, it is the most powerful.

Our sacred water teaches us that we have great strength to transform the highest mountain while being gentle , soft and flexible.

Water will always find a way around obstructions, under, over and through.

It teaches us anything is possible.

Water movements, pathways resiliency and power teach us who we are and who we can be as people

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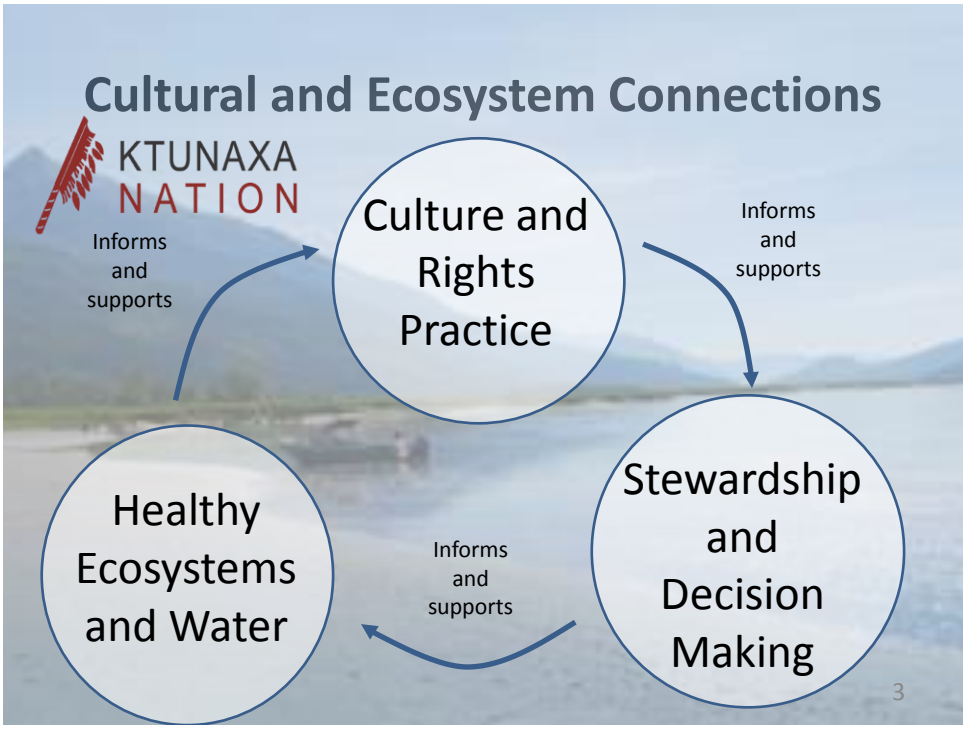

Ecosystem Function Management

Western science description includes:

- Structural components of an ecosystem (e.g., vegetation, water, soil, biota, and atmosphere)
- How these components interact with each other
- The state or trajectory of the ecosystem
- The services an ecosystem provides for humans or other organisms
- ***Clearly defined goals and objectives that include social and cultural importance***

Indigenous perspectives include:

- Responsibility for caring for the land
- Provision of food
- Ecosystem and indigenous nations cultural values are inextricably linked

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How the Treaty Impacts BC Ecosystems

Ecosystem Losses (hectares)

Ecosystem Type	Kinbasket	Arrow Lakes	Koocanusa	Duncan	Total
Lakes	2,343	34,992	0	2,583.9	39,919.2
Rivers	4,896.6	2,021.9	1,490.1	424.5	8,833.1
Streams	192.1	50.6	10.3	17.7	270.7
Shallow Ponds	555.1	102.9	210.6	172.3	1,040.9
Gravel Bars	235.6	3,262.8	80.4	22	3,600.8
Wetlands	5,862.6	3,431.6	1,071.9	1,824.5	12,190.6
Flood plains	15,526.5	3,563.5	2,173.1	1,396.6	22,659.7
Upland Ecosystems	13,035.7	3,844.3	1,646.8	860	19,386.8
Total	42,647.2	51,270	6,683.2	7,301.5	107,901.8

Source: Dam Footprint Impact Study, 2011

Ongoing Operations Impacts

- Nutrients trapped behind dams, barren ecosystems in drawdown zones, streams inaccessible for fish spawning, rapid changes in flow below dams impair fish habitat and cause fish stranding and scouring, etc.

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Widespread Support to Include EF

BC CRT Review (2011-2013)

- Indigenous Nations advocate for addition of EF as equal to flood control and hydropower production
- Input at community meetings support adding ecosystem function
- CRT Local Governments Committee recommendation same as Indigenous Nations

BC Decision (2014)

BRITISH COLUMBIA — Columbia River Treaty Review — *B.C. Decision*

- *Ecosystem values are currently, and will continue to be, an important consideration in the planning and implementation of the Treaty.*
- *The Province will explore ecosystem-based improvements recognizing that there are a number of available mechanisms inside and outside the Treaty.*

US Regional CRT Recommendation (2013)

- With leadership from regional Tribes, this recommendation is consistent with BC regional Indigenous Nations perspectives

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Why Indigenous Leadership? How We Are Working With Others

- Indigenous Nations are advocates for including ecosystem function, and now partners in CRT negotiations
- Indigenous ecological knowledge and pre-dam impoundment conditions as the foundational context for understanding and improving ecosystem function
- Using best available science/knowledge from past work and through close collaboration with:
  - government agencies - BC FLNRORD and federal Department of Fisheries and Oceans
  - recognized experts within non-government organizations, academia and consulting firms

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EF Terms

- **Goals/objectives** – Define desired outcomes compared to baselines.
- **Performance measures** – Units that describe the desired outcomes; used to evaluate alternative scenarios.
- **Scenario modelling** – Computer modelling of potential operational flows and reservoir levels; some scenarios designed to meet goals/objectives for specific interests to test impacts on other interests (i.e. EF scenarios to test impacts on hydropower generation and flood management goals/objectives)

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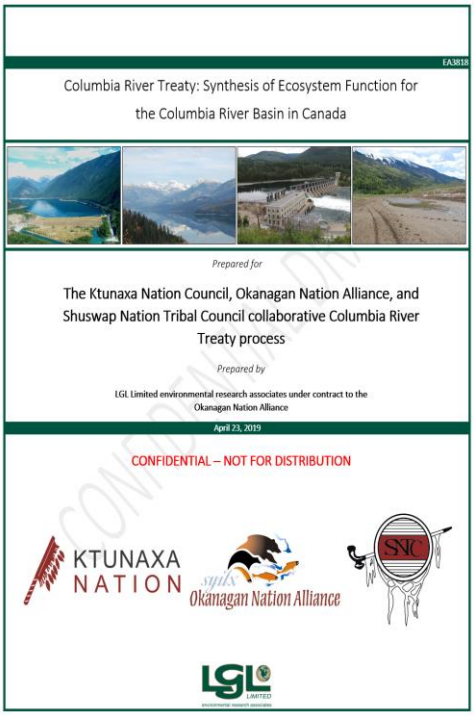

Purpose

Compile goals, objectives, performance measures, data gaps and studies needed to inform CRT negotiations

Methodology

- Draft prepared by consultant advisor
- Indigenous Nations workshop review and revisions
- External review by government agencies, academics, consulting experts
- Priority study identification to inform CRT negotiations
- Climate change is being incorporated

A work in progress

Draft to be refined to reflect external review comments and community feedback, then as data gaps are filled and with learning from scenario modelling

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Context of Current Work

- Focused on EF elements that are relevant to CRT– *flows* and *reservoir levels*- broader hydro system-wide elements require further work
- Studies that can be completed in the near term to inform CRT operational decision-making
- Comparisons:
  - pre-dam conditions
  - current conditions (2012 with Water Use Plans and NTSA)

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General EF Goals

- ***Improved ecosystem function*** to support Indigenous cultures (including responsibility, access and uses) and Basin resident values
- ***Flexibility in reservoir operations*** to facilitate active adaptive management
- Reservoir operations that ***balance*** achievement of the range of ecosystem function objectives

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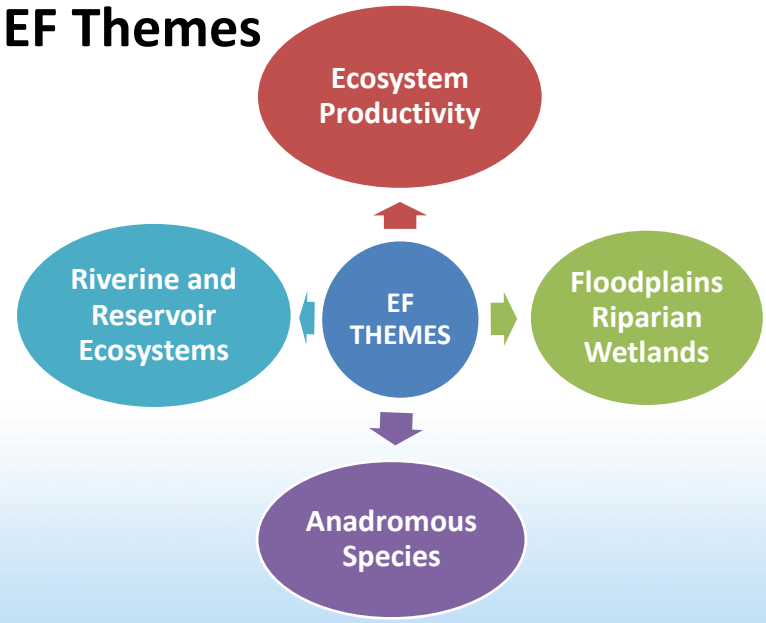
EF Themes



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Ecosystem Productivity

GOAL A. Increase primary, secondary, and tertiary **floodplain, riparian, wetland, and upland** (FRWU) **ecosystem** productivity.

GOAL B. Improve **physical conditions** in aquatic riverine and reservoir ecosystems to **optimize food web production** and transfer of nutrients between trophic levels.

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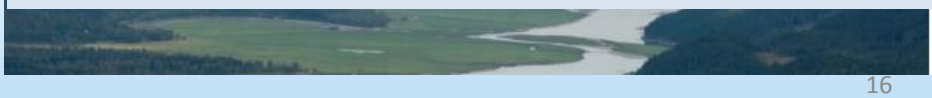
Floodplains, Riparian and Wetland Ecosystems

GOAL A. Increase the **area of functioning habitats for native species** that use floodplain, riparian and wetland ecosystems in the upper elevations of drawdown zones and affected river reaches of CRT reservoirs.

GOAL B. Increase **wildlife habitat connectivity** both within the reservoir drawdown zones and from the drawdown zones and affected river reaches to adjacent upland habitats.



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Reservoir and Riverine Ecosystems

GOAL A. Manage **flows to achieve geo-fluvial processes** that mimic normative/pre-dam erosion rates and sediment transport rates as well as reduce loss of land and aquatic habitats.

GOAL B. Increase and improve functional **free-flowing riverine mainstem habitats** including seasonal availability of critical species-specific, life history-dependent habitats especially related to **functional water flow regimes.**

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Reservoir and Riverine Ecosystems

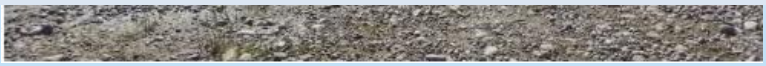
(continued)

GOAL C. Increase **access to, and connectivity** between mainstem, reservoir, and tributary habitats.

GOAL D. Improve **water chemistry** to support aquatic ecosystems.

GOAL E. Maintain **surface water temperatures** that support native aquatic species.

GOAL F. Reduce current levels of **fish mortality** directly due to hydro generation operations.



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Anadromous Species

GOAL A. Manage **flows** to maximize anadromous species survival and condition for Okanagan species and potential Upper Columbia donor stocks.

GOAL B. Increase the biodiversity, abundance, biomass, condition, and quality of the fishing experience of anadromous species throughout the existing range in the **Okanagan River system**.

GOAL C. Restore diverse, productive, harvestable populations of anadromous salmon throughout their pre-dam range in the **Upper Columbia River in B.C**.

Next Steps

1. **Incorporate community feedback**
2. **Implement 5 general and 9 specific performance measure/scenario studies** with collaborators
3. **Evaluate scenario modelling approaches** that best meets the needs of Indigenous Nations and Basin communities; implement through partnerships
4. **Develop and evaluate EF scenarios** using refined performance measures
5. **Refine the Synthesis** – including feedback from community meetings

Beyond EF – Scenarios to achieve balance with the other CRT objectives for flood risk management and power generation

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Need Flexibility in CRT

- Much to be learned about integrating EF into hydro operations
- Learning will be through studies, scenario modelling and active adaptive management
- Learning will take time

Treaty must have flexibility to support integrating EF over time

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How You Can Provide Feedback

- Feedback during this meeting
  - Group discussion notes
  - Individual feedback on the form provided
- On-line Survey at CRT Engage

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Questions and Discussion Groups

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