

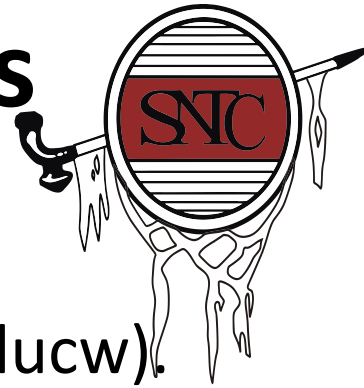
Towards Integrating Ecosystem Function in the Columbia River Treaty

**Columbia River Treaty Community Meetings
October 7 – November 28, 2019**

Outline

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

Ecosystem/Secwepemc Values



1. Respecting Secwepemculucw

We are taught to respect our lands (Secwepemculucw). The Columbia River Treaty has had serious impacts to our traditional lands and resources as well as our people. Priority must be given to improving ecosystem health within the Columbia River basin.

2. Neku7 te Setetekwe (One River)

We must take into consideration the whole Columbia River Basin when we work toward protecting Indigenous cultural resources and sustaining clean water and healthy populations of fish, wildlife and plants.

Cultural and Ecosystem Connections



KTUNAXA
NATION

Informs
and
supports

Culture and
Rights
Practice

Informs
and
supports

Stewardship
and
Decision
Making

Informs
and
supports

Healthy
Ecosystems
and Water

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



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.

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)



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

EF Terms

Term	Example
Goals/objectives – Define desired outcomes compared to baselines	Increase area of floodplains, wetlands and riparian habitats
Performance measures – Units that describe the desired outcomes; used to evaluate alternative scenarios.	Hectares of these habitats compared to current operations and pre dam habitats
Scenario modelling – Computer modelling of alternative potential operational flows and reservoir levels	Scenario 1 – Stable lower Arrow reservoirs levels Scenario 2 – Maximize power generation Etc...

Columbia River Treaty: Synthesis of Ecosystem Function for the Columbia River Basin in Canada



Prepared for

The Ktunaxa Nation Council, Okanagan Nation Alliance, and
Shuswap Nation Tribal Council collaborative Columbia River
Treaty process

Prepared by

LGL Limited environmental research associates under contract to the
Okanagan Nation Alliance

April 23, 2019

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Purpose

Compile goals, objectives, performance measures, data gaps and studies needed to inform CRT negotiations on flows and reservoir levels

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

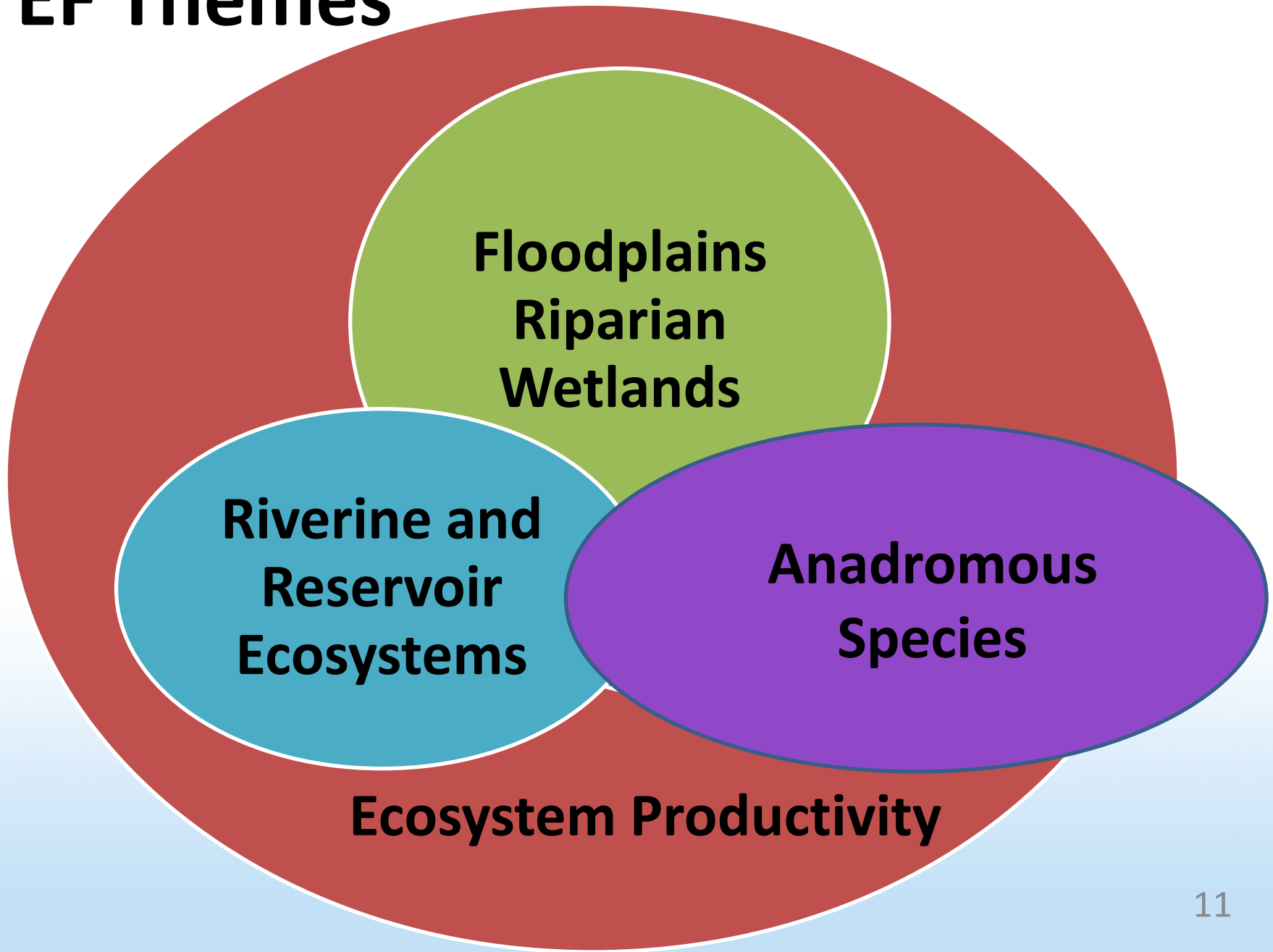
Will be refined with external review comments and community feedback, then as data gaps are filled and with learning from scenario modelling

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



EF Themes



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.



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.



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**.




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.


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.**



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



Next steps

- Feedback during this meeting
 - Group discussion notes
 - Individual feedback on the form provided
- On-line Survey at CRT Engage by December 9
- 14 studies to fill data gaps
- Evaluate scenario modelling approaches; implement best approach
- Synthesis updates



Questions and Discussion Groups