Cowichan Watershed Board
Speaker Series
April 25, 2019

Climate change and the Cowichan River...
The Next 15 minutes...

- The River
- The Fish
- The Crisis
- What can we do...?
Climate Change in the Cowichan Valley

• More precipitation in winter with warmer temperatures
  – Less snow (natural storage), more freshet conditions

• Hotter and drier in the summer (no snow melt to augment flows)

• No longer about avoiding impacts - about minimizing impacts (doing a really bad job so far) and mitigating/managing the effects
CLIMATE CHANGE...

- LAKE INFLOWS HAVE DECREASED BY OVER 30% SINCE 1960’S
- Expected to drop significantly over next 30 years....
Climate change

- For first 40 years of operation the Cowichan Weir successfully provided required E-flows
- It has failed to do so 4 out of the past 5 years
- We have had to truck fall run Chinook salmon upstream 3 times since 2003 due to inadequate flows to provide upstream access....
- What is considered extreme drought will be the norm by 2050.
What’s at risk?

A small miracle...

- Salmon are a keystone species and ecological driver in Cowichan Watershed – 5 species of anadromous salmonids
- Stable Chum salmon populations inject almost 2 million pounds of marine captured nutrients into the Cowichan Watershed every year
- These nutrients contribute to a complex and vibrant ecosystem - can even be traced to the riparian forest growth
Chinook Salmon...

- Of tremendous importance to Cowichan Tribes members for food, social and ceremonial purposes.
- Key Limiting Factor to success of Southern Resident Orca Pod
  - Limited by availability of chinook
- We are still learning about the relationship between river flows and Cowichan Chinook....
- Different life history phases have differing needs and limiting factors
- For Example....
Upstream Migration

- River flows key to providing upstream access to both spring and fall runs of chinook.

- Different challenges depending on timing...

- Eg. Predation, access to cool summer holding refugia.
Downstream migration

- Juvenile chinook start their migration in March and must have access to specific habitats in order to grow to a critical size before entering the estuary.
- The availability of these habitats depends on river flow....
PIT Tagging Studies

• Have revealed a strong relationship between spring flows and downstream migrating juvenile chinook
• May 2016 – low flows in river – approx. 80% attrition from upstream release site to downstream array site
• May 2017 – higher flows – approx. 80% survival from upstream release site to downstream array site....
Water levels in the lake are also important....

- SARA listed “Cowichan” Lamprey
- Lake tributary Coho with unique lake dependent life history
- Cutthroat trout and kokanee
- The shallow vegetated “edge habitat” around the lake is key for these species
Lake level dropped to a low of 28% this year – early March

2019 Cowichan Lake Level - 2019 (Black) & 2018 (Blue) & 2017 (Green)

mean annual high lake level

lake is at 30% full

Zero storage @ 7 cms release from lake

Zero @ 4.5 cms - last day of this flow with all gates open
Lake is now at 70% Full
2019 began with unusual winter drought and release flow from lake dropping to as 16 cms in March.

River flows measured in Lake Cowichan
Fisheries flow guidance noted as:
- 25 cms: April 1 - April 30 and
- 15 cms: May 1 - June 14

If all gates closed, gate position will plot here.

100% open gate position indication
Snow pack in Cowichan Watershed much lower than previous 3 years
Steps to water security by increasing water storage in Cowichan Lake

1. Complete inclusive, consensus based structured decision making based Water Use Planning Process

2. The development of detailed engineering design, structural specifications, environmental assessments, cost estimates and detailed design drawings as well as the public consultation on the new proposed works.

3. The required survey and legal definition of the existing natural boundary of the Lake Cowichan shoreline and properties to meet provincial requirements.

4. Identify a license holder

5. Finance and Construct the weir
## WUP

### Culture and Heritage
- First Nations Salmon Harvesting Rights (FSC)
- Traditional Knowledge Transfer & Generation
- Ceremonial Bathing (Cultural Practices)
- Archaeological Sites (Cowichan River)

### Environment (Cowichan River)
- Geomorphology
- Connectivity (lateral)
- Water Quality
- Fish Passage
- Salmonid Rearing
- Salmonid Spawning
- Wildlife and Riparian

### Environment (Cowichan Lake)
- Water Quality
- Vancouver Lamprey
- Lake Littoral Habitat
- Wildlife and Riparian

### Industry and Commercial
- Catalyst Paper
- Agriculture (Irrigation / GW Wells)
- Commercial Fisheries

### Lakefront Properties
- Flooding and Inundation
- Private Property Lakefront Areas
- Docks / Wharves
- Private water pump intakes

### Municipal
- Waste Water
- Water Supply - Lake
- Water Supply - River

### Recreation and Tourism
- Lake - Recreational Beach Use
- Lake – Boat Access / Navigation
- River – Boating and Tubing
- Angling / Fishing

### Water Management
- Infrastructure Capital and Operating Costs
WUP Outcome...

The Cowichan River is one of the most productive rivers on the eastern side of Vancouver Island and without action it will look radically different by the 2050s. **Salmon stocks that utilize the river to spawn and rear during the summer and early fall period will be decimated.**

Chinook, Coho and Steelhead are particularly vulnerable.
Bottom Line

• We are facing unprecedented challenges with respect to managing our water resources
• We have an opportunity to make adjustments in the way that water is managed to benefit the unique and critically important environmental values that are becoming increasingly threatened in the Cowichan Watershed as a result of significant hydrological changes caused by climate change
• The decisions we make will affect the things that matter to us, including the environment in the river and the lake
• We are making decisions that will affect the lives of future generations
Huy Tseep q’u