Cowichan Lake Weir Project

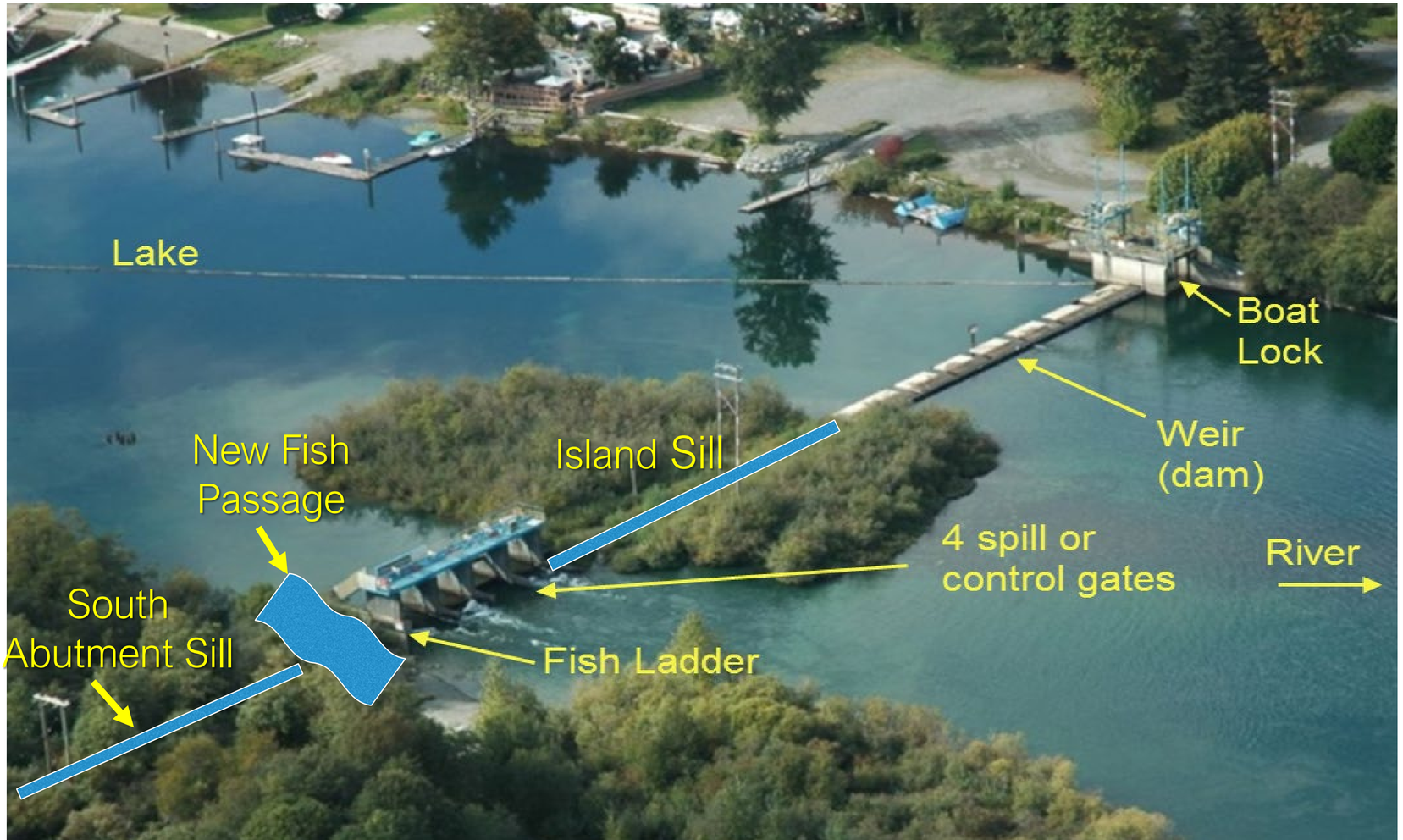
1. Weir Design Update
2. Shoreline Assessment Project Update
3. BCSRIF Grant Update
4. Communications Plan Update

1. Weir Design Update

Weir design is progressing on schedule (complete by June 2021) and on budget ($1.25M)

1. Weir Design Update

1. Preliminary design complete.
2. Failure Modes and Effectives Analysis (FMEA) completed for the preliminary design
3. The Weir Design general arrangement is fixed. Incorporation of a cold-water system in this design phase is now on-hold.



1. Weir Design Update

4. Final design is ongoing. Tasks include:

- Preparation of the design drawings and construction specifications,
- Detailed structural design and preparation of design calculations
- Gates/mechanical engineering design, procurement strategy and performance specifications;
- Electrical Designs
- Software application for process control

5. Constructability assessment and a preliminary design cost review was just completed last week.

6. Project's footprint environmental assessment started now that the concept is finalized.

CVRD

1. Weir Design Update

Preliminary Costs Estimates:

1. Weir System (without Walkway) $17.3M
2. Walkway $ 3.3 M
3. Cold Water System (1.6 meter diameter, 1.8 km long)
    - $19M with favourable lake bed conditions
    - $30M with unfavourable lake bed conditions

CVRD

2. Cowichan Lake Shoreline Assessment Project

- Currently on schedule (March 2022) and budget ($925K)
- Objectives:
  - Assess & Map current shoreline conditions. Create an ‘AS IS’ picture.
  - Forecast changes to the shoreline based on 1. a raised weir and 2. from climate change.
  - Identify impacts to riparian access rights and to use of property.
  - Provides supporting documentation for the future Water License process.

CVRD

2. Cowichan Lake Shoreline Assessment Project

The Current Natural Boundary

These 3 factors act to determine where the current natural boundary lies:

1. **The Presence of Water** – How frequently is water at particular elevations.
2. **The Action of water –** Wave energy. Natural (wind) and unnatural (boating).
3. **The Character of the shoreline**. – What the shoreline is made of (bedrock, boulders, sand, clay, etc) it's slope and it's related vegetation.

Note: The natural boundary can only be officially determined by a BC Registered surveyor.

ADD a new weir, **ADD** climate change and model the 3 elements above to determine where a new/future natural boundary might be.

Natural Boundary Definition (LTSA, Surveyor General):

"natural boundary" means the visible high water mark of any lake, river, stream or other body of water where the presence and action of the water are so common and usual, and so long continued in all ordinary years, as to mark on the soil of the bed of the body of water a character distinct from that of its banks, in vegetation, as well as in the nature of the soil itself; LAND ACT [RSBC 1996] CHAPTER 245

CVRD

2. Cowichan Lake Shoreline Assessment Project

The Natural Boundary – the 12 point workplan

1. **Methodology Review**: Review workplan and methodology with CVRD and Stakeholders (Steering Committee established). Complete.

1. **Data Review:** Gather, collect and compile data and carry out desktop review to identify missing data or data quality issues that my need field follow up. Complete.

2. **Field Data Collection**: Complete a detailed field reconnaissance and survey of the entire shoreline using a BC registered surveyor to document current conditions. Complete.

3. **Confirm Analysis Approach**: After collection of the field data is compete, reconfirm the analysis approach and suitability/defensibility of available data with CVRD prior to moving onto detailed analysis. Use GIS tools to present state of data. Underway

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2. Cowichan Lake Shoreline Assessment Project

5. **Hydrologic Model:** Model changes in water level frequency for the current and upgraded weir using current and future climate conditions and integrate the results into GIS. Underway

6. **Wave Energy Model:** Model wave energy across the lake to establish water level wave energy relationships for the shoreline for both wind waves and boat wake waves. Wind and Wave data collection buoys (2) where deployed in January for an 8 month period.

7. **Ecology Classification:** Use field observations and mapping data to define relationships between natural boundary location and ecological characteristics and to map shoreline reaches into GIS with similar characteristics. Underway.

8. **Quantify the Changes to the Natural Boundary:** Combine all data sources within the GIS tool. Assess the likely changes to the natural boundary as a result of the various scenarios. Not yet started.

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Cowichan Lake Shoreline Assessment Project

9. **Quantify Boundary Change:** For those shorelines with higher degree of change to the natural boundary carry out further detailed shoreline erosion modelling to quantify the degree of potential changes. Not started.

10. **Map Existing and Future Natural boundary:** Map the location of the current natural boundary (mostly complete) and the future predicted natural boundary using GIS data and mapping tools.

11. **Lot by Lot Impact Reports:** Develop detailed lot by lot impact reports to identify impacts to each property. Under development. https://www.kwl.ca/gis/cowichanlake

12. **Report:** Report findings and review with CVRD and Steering Committee. Report out to public.

CVRD

Environmental Assessment

There are a couple of criteria that may trigger a whole lake Environmental Assessment as determined by the Environmental Assessment Act 2019, Table 9 – Water Management Projects.

- If greater than 10 million cubic meters of water is above the natural boundary. (Note: that a 70cm rise = 43.4 M cubic meters for Cowichan Lake)

- If a modification results in an increase of the flooded area of the reservoir, as permitted under the *Water Sustainability Act*, by more than 20 hectares. (note: the lake surface is approx. 6204 hectares)

These two calculations will be performed by KWL as part of this project to determine next steps.

Full Environmental Assessment – likely 2+ years. Option for an ‘exemption’ exists but would require 6-8 months of effort.

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3. BC Salmon Recovery and Innovation Fund (BCSRIF) Grant

Actual spent to date: $1.6M
Forecast to complete project: $1.3M

Total: $2.9M

Grant value: $4.1M (note: $1.2M returned back to BCSRIF)

4. Communications Plans

Project Website – continues throughout the project (www.cowichanlakeweir.ca)

June 2021 – Public meeting (virtual)

1. Review Final Weir Design Details with Costs and Options
2. Shoreline Assessment Work – create a common understanding with educational information, sample property renderings, project timelines.

Sept/Oct 2021 – Public presentation

1. Presentation of shoreline assessment preliminary findings.
2. Check in for concerns and information gaps
3. Q&A

March/April 2022 – Public presentation

1. Present the final outcome of the Shoreline Assessment Project
2. Present the Map View Tool and users guide
3. Discuss next steps

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