



## COATS MARSH REGIONAL PARK WEIR

### RECOMMENDATION

That RDN staff proceed with the removal and decommissioning of the existing concrete weir at Coats Marsh Regional Park subject to regulatory approvals from the BC Ministry of Forests and Environment and Climate Change Canada.

### BACKGROUND

Coats Marsh Regional Park is located on Gabriola Island and is co-owned by the Regional District of Nanaimo and The Nature Trust BC. The land was received in part through a donation through the federal Ecological Gift Program, which is administered by Environment and Climate Change Canada (ECCC).

The park includes approximately 10ha of wetland which drains into Coats Marsh Creek. The creek travels through private property and a section of Coats Marsh Regional Park before passing through a culvert under South Road and draining into Hoggan Lake.

The wetland is retained by a concrete weir and by a beaver dam. The concrete weir was pre-existing when the land became a Regional Park and its exact construction date is unknown. The beaver dam is located approximately 55m upstream of the weir and is approximately 1.0 – 1.2m higher than the top of the concrete weir. The relative locations of the weir and the beaver dam have effectively created a “lower” pool located between the weir and beaver dam, and an “upper” pool whose water level is determined by the beaver dam elevation. The upper pool is considerably larger than the lower and forms most of the marsh (see Figure 1).

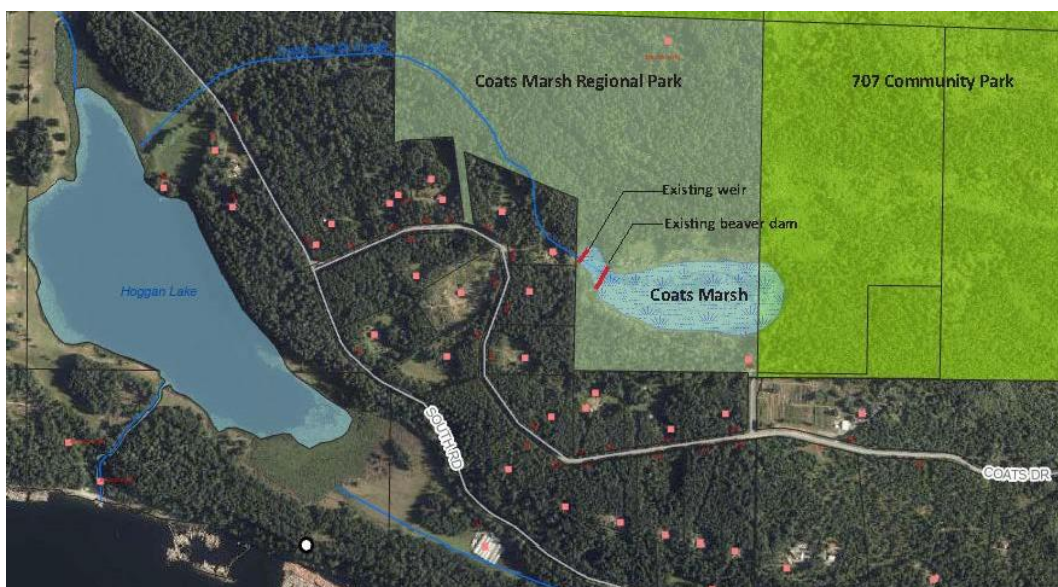


Figure 1: Coats Marsh Contextual Diagram

SRM Projects conducted an engineering assessment (Attachment 1 – Coats Marsh Weir Assessment) of the concrete weir in 2020, which identified a few defects and recommended reinforcement or replacement of the weir. The study also noted that a failure of the beaver dam could cause downstream property damage and could also jeopardize the integrity of the concrete weir.

In response to the concerns related to flooding of neighbouring private property and the condition of the existing weir, Madrone Environmental Services Ltd. (Madrone) was hired to prepare a water level management strategy to address the water level differential between the upper and lower ponds. Within the report, Madrone proposes a siphoning system over the dam to allow for the water level in both ponds to remain at or close to the outlet weir elevation (Attachment 2 –Water Level Management Strategy). The siphons were installed in 2021 and have been successful to date at lowering the upper pond close to the weir elevation level.

In 2022, staff contracted a consulting team consisting of Northwest Hydraulic Consultants Ltd (NHC) and Environmental Dynamics Inc (EDI) to prepare a study of weir replacement options (Attachment 3 – Coats Marsh Weir Replacement Elevation Study). This study outlines five different weir replacement scenarios, including decommissioning the weir, and replacing it at four different elevations. The study includes regulatory considerations, estimated construction costs, and environmental impacts for each scenario.

The five scenarios include:

1. A replacement dam structure, set to a lower elevation than the existing weir, which allows the existing berm to remain in place.
2. A replacement dam at the same elevation as the existing weir structure.
3. A replacement dam at an intermediate elevation between the existing weir structure and the top of the site's beaver dam at present conditions.
4. A replacement dam at the same elevation as the beaver dam at present conditions.
5. Decommissioning the weir and restoring the site to an unregulated condition, including removal of the existing beaver dam.

The study also confirms that the existing weir is regulated under the provincial *Water Sustainability Act* and the BC Dam Safety Regulation and has several deficiencies relative to current dam safety standards. In accordance with provincial guidelines, NHC provided a dam consequence classification review and recommended a preliminary classification of High Consequence for the existing weir. A high consequence weir has several safety requirements such as weekly site surveillance and a legislated Dam Safety Review every 10 years that must be followed. Note, safety requirements change if the classification rating can be reduced.

All five of the scenarios proposed in the Coats Marsh Weir Replacement Elevation Study recommend removal of the beaver dam. From liability and engineering perspectives, these are sound recommendations. However, those approaches would cause significant disruptions to the environment in the park either through extensive construction activities, reducing or eliminating the available aquatic habitat, or both.

Through discussions with The Nature Trust of BC, the preference is to keep the beaver dam intact to minimize these disruptions. As such, it is recommended that the existing concrete weir be removed and that the beaver dam be left in place. This project scenario is not included as one of the five scenarios for the Coats Marsh Weir Replacement Elevation Study, however comments and analysis of this option are provided on page 39 of the study (Attachment 3).

Removing the concrete weir while retaining the beaver dam offers a project approach that would minimize the construction activities in the park and would retain the beaver dam and the aquatic habitat that it provides. It is assumed that ECCC would support this recommendation however, this has yet to be confirmed.

This recommended approach is not without risk, and there are number of uncertainties with this scenario. The main advantages and disadvantages are listed below in Table 1.

**Table 1: Pros and Cons – Weir decommissioning while retaining beaver dam**

Pros	Cons
<ul style="list-style-type: none"> <li>• This is the preferred project scenario from the Nature Trust BC.</li> <li>• Removes built infrastructure from the park.</li> <li>• Reduces operational costs associated with maintaining a regulated dam structure.</li> <li>• Comparatively low capital cost.</li> <li>• Retains the aquatic ecosystem in its present state upstream of the beaver dam.</li> <li>• Comparatively low site impacts from construction activities.</li> </ul>	<ul style="list-style-type: none"> <li>• Regulatory uncertainty. The province expressed willingness to accept and review this project but has not committed to approval.</li> <li>• Liability uncertainty. The RDN would most likely retain liability associated with keeping the beaver dam in place.</li> <li>• Beaver dam uncertainty. Removing the concrete weir will drain the lower pool area of the marsh, exposing the bottom slope of the beaver dam and potentially weakening it. The beaver may die or leave the marsh, resulting the beaver dam no longer being repaired or maintained.</li> <li>• A failure of the beaver dam may cause damage downstream to private property and infrastructure. This risk could be minimized by relocating the cabin that’s located on private property within the floodplain or removing the unlicensed stack rock weir adjacent to the cabin to increase channel capacity.</li> <li>• A failure of the beaver dam would also drain Coats Marsh and may result in the requirement for environmental restoration work.</li> </ul>

**Regulatory Considerations**

The recommended weir decommissioning project will require support or approval from a number of agencies.

- The Nature Trust of British Columbia (NTBC)
  - NTBC are co-owners of the property and have expressed support for the project (Attachment 4)
- BC Ministry of Forests
  - The existing Coats Marsh weir is a provincially regulated structure and is regulated by the Water Sustainability Act and the BC Dam Safety Regulation. Operation of the existing structure, as well as any future repair, replacement, or decommissioning work will require approval from the province.
  -
- Environment and Climate Change Canada (ECCC)
  - The federal Ecological Gifts Program is administered by ECCC. The park property was received in part through this program, and any changes to the environment in the park require approval from ECCC. If works are done in the park without prior authorization from ECCC, a federal tax equal to 50% of the fair market value of the land may be applied.

Other legislation pertinent to the project includes the provincial Wildlife Act and the federal Fisheries, Migratory Birds, and Species at Risk acts. All appropriate permits and approvals will be obtained during the detail design phase of the project.

**FINANCIAL IMPLICATIONS**

***Capital Reserves***

The estimated cost to decommission the weir and retain the beaver dam is \$415,000 (Table 2).

**Table 2: Coats Marsh Weir Decommissioning Estimated Costs**

ITEM	Estimated Cost
Construction	\$215,000
Professional Services	\$125,000
Contingency	\$70,000
<b>TOTAL</b>	<b>\$415,000</b>

The above cost estimate is taken from Table 5.3 on page 41 of Attachment 3 and is for Scenario 5 which involves decommissioning the concrete weir, removing the beaver dam, and site restoration. If the project proceeds as recommended, with decommissioning the concrete weir and retaining the beaver dam, project costs may be lower as less site restoration would be required. It is recommended to carry the above amount to account for the possibility of beaver dam failure and subsequent site restoration.

The 2023 Regional Parks budget includes \$950,416 for Coats Marsh Regional Park Weir Replacement. This project is funded from capital reserves and any savings realized would remain in reserves.

At the March 7, 2023, RDN Board Meeting the following motion was passed:

*It was moved and seconded that the Board direct staff to explore grant funding in collaboration with the Nature Trust of British Columbia for Coats Marsh PR00546 and provide a report to the Board.*

The Nature Trust BC has committed to supporting any future grant applications for this project (Attachment 4). Staff will apply to applicable grants as opportunities arise.

***Operations***

Parks staff regularly visit the park to review conditions and remove debris that may block water flow between the beaver dam and the weir. This monitoring program will continue after the weir is decommissioned.

**Table 3: Coats Marsh Water Flow Monitoring**

Parks staff monitors flow 30 times annually	\$3,000
<b>TOTAL</b>	<b>\$3,000</b>

**STRATEGIC PLAN ALIGNMENT**

Environmental Stewardship - Protect and enhance the natural environment, including land, water, and air quality for future generations.

**REVIEWED BY:**

- A. Gore, Superintendent, Parks Planning, Research and Development
- R. Daykin, Manager, Parks Services
- T. Moore, Chief Financial Officer
- T. Osborne, General Manager, Recreation and Parks /Acting Chief Administrative Officer

**ATTACHMENTS**

1. Coats Marsh Weir Assessment
2. Water Level Management Strategy
3. Coats Marsh Weir Replacement Elevation Study
4. Nature Trust of British Columbia – Letter of Support

Rick Daykin  
Manager of Parks Services  
Regional District of Nanaimo  
6300 Hammond Bay Road  
Nanaimo BC V9T 6N2

**RE: Letter of Support regarding Coats Marsh Weir Replacement**

The Nature Trust of British Columbia (NTBC) has had recent discussions with the Regional District of Nanaimo (RDN) and have reviewed a recently completed report prepared for the RDN by Northwest Hydraulic Consultants Ltd. regarding the Coats Marsh weir. The weir is recognized as an aging piece of infrastructure related to water control at Coats Marsh. Please accept this letter of support as confirmation from the Nature Trust of British Columbia (NTBC) that we support an approach that seeks to decommission the existing weir and retain an existing significant beaver dam present in Coats Marsh (the Project), a nature based solution to future water control at Coats Marsh. To that end, NTBC is committed to supporting the RDN with any future grant applications and discussions related to the Project.

Sincerely



Jason Emery

Director of Conservation land Management

Nature Trust of British Columbia