

REGIONAL DISTRICT OF NANAIMO
REGIONAL PARKS AND TRAILS COMMITTEE
REVISED AGENDA

Tuesday, February 6, 2024

10:00 A.M.

Board Chambers (Webstreamed)

This meeting will be recorded

Pages

~~1. CALL TO ORDER~~

~~2. TERRITORIAL ACKNOWLEDGMENT~~

~~The Chair will respectfully acknowledge the Coast Salish Nations on whose traditional territory this meeting takes place.~~

~~3. APPROVAL OF THE AGENDA~~

~~4. ADOPTION OF MINUTES~~

~~4.1 Regional Parks and Trails Select Committee Meeting – October 3, 2023~~

~~4~~

~~That the minutes of the Regional Parks and Trails Select Committee meeting held October 3, 2023, be adopted.~~

~~5. CORRESPONDENCE~~

~~That the following correspondence be received for information:~~

~~5.1 M. Collins, Agricultural Land Commission, re Application 54843 for Recreational Trail Use in the Agricultural Land Reserve~~

~~7~~

~~5.2 J. Urbanovitch, re RDN Top Bridge Conservation Park / No Dogs Enforcement / Justice Certification~~

~~28~~

~~*5.3 D. Gaudry and N. Locke, Nanaimo and Area Land Trust, re Mount Benson Regional Park Trail System~~

~~31~~

~~6. COMMITTEE MINUTES~~

~~6.1 Benson Creek Falls Regional Park Creekside Place Staging Area Advisory Committee – January 22, 2024~~

~~32~~

~~That the minutes of the Benson Creek Falls Regional Park Staging Area Advisory Committee meeting held January 22, 2024, be received for information.~~

~~7. COMMITTEE RECOMMENDATIONS~~

~~7.1 Benson Creek Falls Regional Park Creekside Place Staging Area Advisory Committee~~

~~Please note: Committee recommendations have no accompanying staff report~~

~~1. That a report be provided on the past development of the Creekside Place Community Park parking lot that serves Benson Creek Falls Regional Park, including information on the riparian area within the Park.~~

~~2. That the Regional District of Nanaimo Parks Division collaborate with the Vancouver Island University (VIU) Woodlot Manager for university students to be commissioned to undertake a visitor count in the Spring of 2024 at both the Creekside Place and Weigles Road parking areas on the number of vehicles and visitor usage patterns of Benson Creek Regional Park and the area's Provincial Woodlots.~~

~~8. REPORTS~~

~~8.1 Parks Division Quarterly Update – Q4 2023 Report~~

~~35~~

~~That the Parks Division Update – Quarter 4 2023 report be received for information.~~

~~8.2 Regional District Parkland Dedication Amendment Bylaw 1726.01~~

~~47~~

~~1. That “Regional District Parkland Dedication Amendment Bylaw No. 1726.01, 2024” be introduced and read three times.~~

~~2. That “Regional District Parkland Dedication Amendment Bylaw No. 1726.01, 2024” be adopted.~~

~~8.3 Coats Marsh Dam Decommissioning Update~~

~~77~~

~~That the Coats Marsh Dam Decommissioning Update report be received for information.~~

~~9. BUSINESS ARISING FROM DELEGATIONS AND CORRESPONDENCE~~

~~10. NEW BUSINESS~~

~~11. IN CAMERA~~

~~That pursuant to the following sections of the *Community Charter* the Committee proceed to an In Camera meeting:~~

- ~~• 90(1)(e) the acquisition, disposition or expropriation of land or improvements, if the council considers that disclosure could reasonably be expected to harm the interests of the municipality; and~~
- ~~• 90(1)(m) a matter that, under another enactment, is such that the public may be excluded from the meeting.~~

~~12.~~ ~~ADJOURNMENT~~

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Coats Marsh Weir Decommissioning Public Engagement Summary

The Regional District of Nanaimo conducted public engagement for the Coats Marsh Weir Decommissioning project beginning on December 18, 2023 and ending on January 26, 2024. Feedback received through the engagement will inform the final design of the project and a summary of the feedback will be submitted to the Province as part of the final decommissioning plan.

The engagement consisted of a project website (www.getinvolved.rdn.ca/coats-marsh-weir) and a public open house meeting. The website included relevant project documents, a timeline, a 'Q&A' tab where visitors could submit questions or comments, and the email contact information of the RDN project manager.

The public open house meeting took place on a Saturday and was attended by approximately 20-30 people. The open house included printed copies of the preliminary decommissioning plan and beaver dam risk assessment, and large-scale posters of the project drawings for discussion. The RDN project manager and NHC staff were in attendance to respond to questions from the public.

The project website and open house were advertised in several local newspapers, through emails to various interested residents and to the RDN Regional Parks and Trails Select Committee, and through letters sent to all private property owners whose properties border Coats Marsh Regional Park, Coats Marsh Creek, and Hoggan Lake.

Project Website

The below are the comments received and responses provide through the project website 'Q&A' tool.

Resident comment:

- I am a retired hydroelectric engineer living on Gabriola and I visit the Marsh and dam regularly. I have technical questions regarding the design. Will there be a chance to discuss my comments/thoughts at the meeting on the 20th?

RDN response:

- Yes, there will be an opportunity to discuss technical details of the project, or any other questions you may have, at the January 20th public information session. Members of the project team attending the information session will include engineers from Northwest Hydraulics, a biologist from Environmental Dynamics, and the Regional District of Nanaimo project manager. You may also submit questions or comments any time through this Q&A tab or directly to Jordan Vander Klok, Parks Planner, at jvanderklok@rdn.bc.ca.

Resident comment:

- When will the dambreak assessment be complete and will that work be made public?

RDN response:

- The Beaver Dam Risk Assessment report from the consulting team was recently completed and has been uploaded to the Get Involved website. Here is the direct link: <https://www.getinvolved.rdn.ca/40553/widgets/169259/documents/121897>

Public Open House

The below is the RDN summary of public feedback received at the January 20th public open house. This summary is not an exact transcript from the public open house and is based on the best recollection of events. The NHC summary (Appendix 1) of the same event captures much of the public input received. This is additional feedback that is not included in the NHC summary.

Some residents expressed concern that the level of public engagement for the project was not adequate.

The RDN noted that the project is complex with multiple approval steps. To date, the RDN Board, The Nature Trust of BC, and Environment and Climate Change Canada have approved the general project direction of removing existing weir while retaining the upstream beaver dam. The RDN also noted that the public engagement conforms to the provincial requirements for the project and is an opportunity to educate the public about the project overall while listening to comments and responding to questions.

Various suggestions about overall park management were shared, including suggestions to limit or reduce the number of park visitors to reduce impacts on wildlife and suggestions to improve signage regarding off-leash dogs.

The RDN noted that these comments may be taken into consideration for future operational decisions, however these topics are outside of the scope of the weir decommissioning project.

Some residents had questions about the difference between Community and Regional Parks in the Regional District of Nanaimo.

The RDN noted that community parks are funded through individual Electoral Areas and Regional Parks and funded by the Region as a whole.

One resident expressed concern about the impacts of the project on songbird populations.

The RDN noted that the restoration plan includes re-planting the lower weir pool area with native species which may provide habitat for birds. Additional details may be provided by the project biologist.

Residents of 1040 Coats Drive submitted a written letter to the RDN (Appendix 2) at the open house.

Upon review of the letter and after some discussion, the RDN verbally committed to:

- Review communication practices with parks operations team members
- Review opportunities for project phasing and discuss feasibility with the project consulting team and the province
- Review design options for retaining the existing berm and discuss maintenance requirements with the province

Email Correspondence

- The RDN corresponded via email and met on site with local resident Mr. Doe. Following the in-person conversation on site, Mr. Doe submitted a letter (Appendix 3) which serves as a summation of the concerns expressed in conversation.
- The RDN received email correspondence (Appendix 4) from a resident who expressed concerns about the restoration plan and provided a list of wildlife species to consider, and a recommended planting list to support local wildlife. The RDN responded and committed to reviewing the species lists with the project biologist and, if appropriate, including some of the recommended planting species in the restoration plan.

3008511 Coats Marsh Weir Decommissioning

NHC summary notes of questions received during the Jan 20, 2024, public townhall meeting on Gabriola Island. The questions and answers described here were not recorded verbatim and represent our best recollection of the questions received from the public and answers provided by NHC staff.

By: Nathan Valsangkar, Graham Hill, Evan Arbuckle

Date prepared: 2024-01-22

Several residents asked whether removal of the weir will affect the stability of the beaver dam.

- NHC noted that weir removal will drain most of the “weir pool” downstream of the beaver dam. The water level differential across the beaver dam will increase, and the dam’s downstream face will have greater air exposure. It is possible that these effects will reduce the beaver dam’s stability, as described in NHC’s beaver dam risk assessment report. The risk assessment report includes a series of monitoring recommendations and potential mitigative measures.

Several residents asked what downstream impacts could be expected during a beaver dam breach.

- NHC provided an overview of the breach modeling report and noted two structures within the potential inundation zone (cabin and shed, both on private property). NHC noted that flows would overtop South Road and likely cause damage; NHC’s report recommends installing “No Stopping” signage along South Road, similar to what was recently installed along Taylor Bay Road.

One resident asked if NHC completed an assessment of the beaver dam, suggesting an analysis of its composition is necessary

- NHC did not undertake a testing program of the beaver dam materials. Beaver dams are widely reported, and based on NHC’s direct experience, to be comprised of organic and inorganic matter. The organic matter is primarily wood, typically generated by the beavers cutting trees and branches with their teeth while eating, as well as fine grained decomposed organics. The inorganic matter is mainly soil with grain sizes ranging from clay to cobble. Beaver dams are also reasonably heterogeneous as a long-standing beaver dam such as the ones at Coats Marsh are typically constructed in many stages, often by multiple generations of beavers. Furthermore, NHC is unaware of any engineering guidelines that outline beaver dam composition sampling, or use of any such sampled data.

One resident asked how the beaver dam breach was simulated

- NHC completed a literature search to determine if there is any case studies or written guidance, but we couldn’t find any engineering data. NHC used a combination of breach parameters from literature for earth dams and concrete dams, as well as its experience and observations breaching beaver dams and its professional judgement to develop breach parameters for the beaver dam. NHC developed dam breach hydrographs, then used HEC-RAS 2D to simulate the floods. NHC also conducted a series of sensitivity runs to assess the effect of the selected breach parameters on the outlet hydrographs. NHC’s opinion is that the selected breach parameter were conservative, yet reasonable.

One resident asked what the effect on Hoggan Lake was under the beaver dam breach scenario

- NHC noted that the volume that the beaver dam is currently impounding is reasonably small relative to the surface area of Hoggan Lake, thus the breach simulation resulted in only a few decimeters of water surface change in Hoggan Lake

One resident asked whether the work would affect downstream flows in the creek, noting that they have seen Cutthroat Trout in the downstream reaches of Coats Marsh Creek near Hoggan Lake.

- NHC noted that the creek is typically dry in the summer. During construction, crews will be required to maintain flows to the downstream creek if there is natural flow occurring. Post-construction, the work is not expected to affect downstream flows since the beaver dam is the primary hydraulic control in the marsh.

Several residents asked whether construction activities will affect the beaver, and what construction methods are proposed to reduce impacts.

- NHC will defer this question to the project biologist, noting that similar questions have been received and will be addressed in the final decommissioning plan.
- These discussions also extended to a project on Saltspring Island which worked with beavers to aid in restoration (Blackburn Lake). Available resources from this project are an example of wetland stewardship in a similar Gulf Island environment.

One resident asked whether rock removal will require blasting. There are concerns around construction-related noise.

- NHC identified that the preliminary decommissioning plan excludes blasting. Rock removal will have to be completed by hammer breaking, ripping, or other mechanical methods.

Several residents asked whether the work will affect pedestrian access to the marsh.

- NHC noted that the existing footbridge will be removed, eliminating pedestrian access across the marsh outlet channel. Otherwise, there are no proposed changes to the trail network as part of this project.

Residents of 1040 Coats Drive expressed a desire to retain the existing berm, rather than removing it. They have concerns around future flooding of their property and potential for interactions with their septic field.

- NHC noted their concern and committed to reviewing it as part of the final decommissioning plan development.

Residents of 1040 Coats Drive expressed a desire to carry out decommissioning in phases and provided a written proposal for how this could be accomplished.

- NHC noted their concern and committed to reviewing it as part of the final decommissioning plan development.

Residents of 1040 Coats Drive identified that the cabin on their property is used for temporary guest lodging, but other purposes as well.

- NHC noted this item; however, it is immaterial to the decommissioning plan and further supports that the consequence classification for the weir should continue to be “high.”

Several residents expressed concern over the effects of the RDN’s beaver dam siphons on downstream flow and water quality, as well as effects on the marsh upstream of the beaver dam. Residents requested advance notice before any siphoning operations start up.

- NHC did not provide comment on this concern, as the use of siphons and related communication protocols are managed by RDN. NHC has not been involved in RDN’s installation or operational decisions regarding the siphon system.

Residents of 1040 Coats Drive identified that the location of an existing drainage pipe is incorrectly labeled on the drawings, and provided an approximate location, with the understanding that the drainage pipe crosses through the existing berm. They also noted that “North” arrows are missing from the design drawings.

- NHC committed to incorporating these changes on the final decommissioning plans.

Residents of 1040 Coats Drive questioned if access into the park from their property would continue to be safe from an existing gate to the south of where Coats Marsh Creek flows into their property.

- NHC pointed to the design which shows a setback from the spillway excavation and the property line of several metres.

Several residents expressed concern that ongoing beaver debris removal from the outlet channel could disrupt wildlife.

- NHC did not provide comment and will defer this question to the project biologist.

A resident suggested that some habitat and species classifications used in the wetland assessment report were based on outdated aerial imagery classification.

- NHC defers comment on this to the project biologist.

Several residents expressed concern around how invasive plants will be controlled following construction, particularly reed canary grass.

- NHC noted that invasives monitoring and control are included in the site restoration plan.

Several residents questioned why the weir needs to be removed or upgraded, and expressed a desire to keep the site as-is.

- NHC noted that the weir qualifies as a “dam” and is subject to the BC Dam Safety Regulation and Water Sustainability Act. It does not meet provincial safety standards and must be decommissioned or upgraded.

Several residents expressed interest in a low-impact marsh viewing platform from the Stanley Park entrance to the park. Residents recalled community action against a proposed trail along the south side of the marsh for conservation reasons, which has not been installed. No concerns were heard about removal of the footbridge at the existing weir site, although attendees value access points to view the marsh.

- NHC has no preference for the footbridge to be removed or be replaced and other concerns regarding trails and recreational amenities are not within the scope of this project.

THIS LETTER WAS PERSONALLY RECEIVED BY JORDAN VANDER KLOK, PARKS PLANNER AT THE PUBLIC
ENGAGEMENT MEETING ON GABRIOLA ON 20 JANUARY 2024

1040 Coats Drive
Gabriola, BC V0R 1X4
20 January 2024

Regional District of Nanaimo
6300 Hammond Bay Road
Nanaimo, BC V9T 6N2

Attention: Tom Osborne

Dear Mr. Osborne,

This letter is in response to the RDN's current planning to modify the management of Coats Marsh. We have reviewed the proposed plan, and have some comments.

Re: RDN Process

Although stakeholders are invited to a "community engagement" session on 20 January 2024, we believe that, as significant stakeholders in the process, we would have suggested a consultation role before moving forward with creating a proposed plan. As adjacent landowners, we have a long-term range of experience with observations and discussions with Park staff regarding the Marsh. We have asked to be partners in protecting the park as an important ecological resource (ref. our letter of 10 May 2011), but we have been excluded in all discussion, and we have not been provided with relevant documentation in a timely way so that we can best respond to your proposals. As a current example, we only received a copy of the engineer's report on the status of the weir after requests over the course of a year.

Re: Health and Safety

The RDN must pay more respect to us as landowners regarding their plans to release water from the marsh. The first time that marsh water was released by the test siphons, NO WARNING was given to us by the RDN, and a significant increase in water levels and flow happened without our prior knowledge. This water was turbid, and had a significant anaerobic smell to it.

For our safety, we expect 72 hours written notice before any water is released by the RDN.

Re: Infrastructure on our Land

We feel that removal of the berm established by the RDN could jeopardize our septic system and our landscaping, and potentially flood our workshop. To date the berm as established has been effective in preventing marsh water encroachment. An interaction between our septic system and encroaching marsh water could adversely affect both assets (ref. our letter of 10 May 2011).

In the NHC Report re: the beaver dam, someone is under the impression that we only use the cabin as a guest cabin, however this is an error. Any suggestion that the cabin or other aspects of our property be removed or otherwise altered is misinformed and irresponsible (ref. May 2, 2023 meeting of the Parks

and Trails Select Committee). All the infrastructure was established prior to the RAR Regulations being adopted, and grandfathered. Any attempt to act otherwise would be in direct opposition to our agreement with Nature Trust BC and the RDN to deal with marsh water issues to our satisfaction.

Re: Environmental Concerns

The RDN has made several attempts to establish controls regarding water flow in the Marsh.

1. When the pond-leveller was installed, it became obvious that it was undersized and became ineffective during high-water situations. Remedial action to extend the pipe and unclog it was taken, but it was not re-installed on a level, leaving the intake higher than it was previously.
2. Berm construction: While effective, we believe, in relieving flooding on our property, the berm, we are told by staff, does not meet regulatory requirements. (We would like this confirmed by RDN staff in writing.)
3. Siphons: It has been written in RDN reports that the siphons have been successful in drawing down the east pond water levels; although this is true, during the winter months the water overtops the beaver dam in several places. This proves that the siphons are inadequate in controlling the amount of water that enters the marsh through the rainy season, and should be removed. There has been a noticeable decline in nesting bird populations in the marsh since the siphons have been installed. We believe that this is due to the consistently fluctuating water levels, leaving the marsh an undesirable nesting area for several species.
4. Water monitoring levels: Has a report been produced regarding when the water levels have been observed and recorded? Where is this information available, and why has it not been made public?
5. Considering the above, we have little reason to be convinced that the current proposal will be successful. The main reason for this is that the RDN is going to require the cooperation of the beaver, and have you got a contract with him? Remember, beaver work 24/7, and don't take stats for holidays. Given the current monitoring of the marsh by the RDN, we believe that this major flaw in your proposal will end in failure.
6. To date, we have not seen any attempts to control invasive species in the marsh, other than by GALT volunteers and individual initiatives by islanders. Your proposal suggests that plantings can be done in the weir pool area. Have you done a soil composition study of the weir pool to understand if your plan could be implemented? Currently, reed canary grass grows in the weir pool area and we believe that this species will quickly choke out any smaller natural plantings. Eradication efforts to control this species can be difficult and time-consuming, and can adversely affect the establishment and growth of newly planted native species and of the animal species that live in the area. This would be devastating to the marsh and consume a huge amount of staff time and effort.
7. To our knowledge, no attempt has been made to assess the composition of the beaver dam or the specific behaviours of the beaver. We have made recommendations to staff that Glynnis Hood, PhD, from the University of Alberta be contacted, as she is a renowned expert in the field. She has authored many books and published many papers on the subject. Your assertion that the beaver dam was established during the pandemic is incorrect. We witnessed the establishment of that beaver dam in 2015. Why the RDN continues to refuse to consult us re: the marsh is beyond us, as we have extensive intimate knowledge of what occurs there, and no off-island consultants who make day trips here will ever understand everything that goes on. We are baffled that plans could be made without benefit of this local knowledge.

We re-iterate that the current proposal, although conceived in good faith, is flawed and will not produce the desired conclusions sought after by staff and the public, and potentially cause irreparable harm to the ecology of the marsh and adverse effects on our property.

At the May 2, 2023 of the Parks and Trails Committee, Vanessa Craig asked if this project could be phased. She received no response to her query, but we believe that this could be a potential compromise. We ask that the relevant committees and consultants consider the following possible response to water management:

Phase 1: 2024: Remove the baffles from the weir, leaving the weir structure in place for the time being. Remove the bridge deck and supporting steel girders. Leave the beaver dam directly upstream from the weir in place. This plug is 2 to 3 meters deep, and 5 meters long currently. The Clemson pond leveller should be increased in diameter, and potentially lowered from its current position.

Phase 2: 2025: One year of weekly monitoring and recording/reporting, with results accessible by the public.

Phase 3: 2026: If necessary, surgically remove the concrete weir, without disturbing the beaver dam adjacent to it.

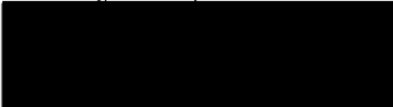
Additional comment: Except for surgically removing the weir, the steps are reversible and provides a low-cost solution to the situation.

No other action should be necessary. This would maintain the weir pool, and, as noted in the report by your consultants, slow any deterioration of the beaver dam situated 55 meters upstream of the weir.

We would appreciate a written response to the concerns presented in this letter.

Thank you,


Guy Mireau


Cheryl Bailey, BSc, BScN

cc: V. Craig
Nature Trust of BC
Doug Routley, MLA
David Eby, Premier BC
Islands Trust, Gabriola
GALTT
Gabriola Streamkeepers
Nick Doe

Please note that I am not qualified academically or professionally to comment on the RDN's plans, though I do have a science background. I live on Gabriola and these are just my islander's opinions based on observations made over a decade of regular visits in all seasons and weathers to the marsh.

These notes are intended to bring members of the Gabriola Island Streamkeepers up-to-speed on the issues but entirely only to the degree to which they have the time and interest to be involved.

The notes reflect only my own opinions and acquired knowledge. They must not to be taken as reflecting the collective views of the Gabriola Streamkeepers membership or the views of any other Gabriola Streamkeepers member.

The notes were written in some haste and the writing may sometimes deserve editing to correct mistakes and dispel the glibness that normally there would be time to do.

Nick Doe

[REDACTED]

Gabriola, BC

Canada [REDACTED]

Phone: [REDACTED]

E-mail: [REDACTED]

Web: <https://nickdoe.ca>

Version 1 (Jan. 15, 2024): distributed to all GSK members and a selected few others.

Version 2 (Jan. 19, 2024): some typos, layout, and consequent page number changes to Version 1. The only content changes of significance are:

- the addition of the single sentence beginning "Comment: The local residents..." on p.9
- the inclusion of Reference 11 received January 15, 2024, and comments.

This version, although current, has not been distributed as the changes to Version 1 are not substantial.

Gabriola Streamkeepers (GSK) Briefing Notes on Coats Marsh Weir

Nick Doe

...in response to the RDN's proposal not to repair or replace the concrete weir at Coats Marsh Regional Park, but instead to demolish it, thereby permanently draining the weirpool.

Doing this would leave only the beaver dam preventing the whole of the marsh from also being drained with complete loss of irreplaceable Gabriola Island wetland habitat.

The RDN is doing this to avoid having to upgrade the weir to the modern provincial government standards for dams that pose a risk to human safety, and to avoid potential liability for damage or loss of downstream private-property "infrastructure" should the weir be left either as it is, or only modestly renovated, and should the beaver dam, which is retaining water to the great benefit of the marsh's ecosystem, subsequently fail catastrophically.

Please check RDN project reference: <https://www.getinvolved.rdn.ca/coats-marsh-weir>

References

These are the official references in case they are needed, but I'm not expecting anyone to read them. Some are out-of-date and contain information and mis-information that GSK members living on Gabriola Island don't need, but I may cite them in this note for completeness.

All are from my own website where they were posted because RDN have on occasion refused to make some of them public, and others are difficult to locate on the RDN website or otherwise obtain.

The meaning of any generally-used acronyms relating to wetlands and watercourses can be found in the GSK glossary <https://nickdoe.ca/pdfs/Webp676.pdf>.

RDN consultants' flushed-out acronyms can be found in the reference list that follows.

1. RDN: Coats Marsh Regional Park, 2011-2021 Management Plan, August 29, 2011 ([File:6101](#)).
2. RDN: Coats Marsh Regional Park, 2011-2021 Management Plan Appendices, August 29, 2011 ([File:6102](#))
3. Madone Environmental Services: Gabriola Island Riparian Area Regulation Stream Identification, February 24, 2012 ([File:6103](#))
4. RDN: Request for Proposals 22-064, Coats Marsh Weir Elevation Study, Addendum 1, July 8, 2012 containing:
Madrone Environmental Services: Post-Construction Report, Coats Marsh Flood Protection Berm, September 12, 2023 ([File: 6104](#))
5. Sustainable Resource Mechanical Engineering and Project Management (SRM Projects): Coats Marsh Weir Assessment, June 1, 2020 ([File:699](#))
6. Madrone Environmental Services: A Proposed Strategy for Water Level Management – Coats Marsh Gabriola Island, BC, September 14, 2021 ([File:6105](#))
7. RDN: [Recording](#) of the meeting of the Regional Parks and Trails Select Committee, May 2, 2023. Begins at 40:58.
<https://rdn-pub.escribemeetings.com/Players/ISISStandAlonePlayer.aspx?Id=46a9d0fa-0d87-4023-9bad-8be577f88d5b>
8. RDN: Staff Report To Regional Parks and Trails Select Committee, May 2, 2023 containing:
Nature Trust of BC: Letter of Support regarding Coats Marsh Weir Replacement ([File:6106](#))
9. Northwest Hydraulic Consultants (NHC): Coats Marsh Weir Elevation Study, April 12, 2023 containing:
Environmental Dynamics Inc. (EDI): Wetland Assessment, April 2023 ([File:6107](#))
10. Northwest Hydraulic Consultants (NHC): Coats Marsh Dam Preliminary Decommissioning Plan, December 18, 2023 containing:
Environmental Dynamics Inc. (EDI): Environmental Components, December 2023 ([File:6110](#)).
11. Northwest Hydraulic Consultants (NHC): Coats Marsh Dam Preliminary Decommissioning Plan, Beaver Dam Risk Assessment, January 10, 2024 ([File:6113](#))

For completeness again I'll list some of the pertinent references on my website (nickdoe.ca), but again I'm not expecting anyone to read them. These references are also itemized on the web page found [here](#).

I have no special expertise, or frankly any interest in, government regulations and legalities, and am not qualified professionally or academically to speak about constructing concrete dams, although I do have an unrelated scientific background which in my retirement years I've used to learn about the ecology and geology of the marsh.

The notes are written in diary form, always within a day or two of my having visited the marsh. They contain observations, calculations, and lots of photographs and include

- a glossary of wetland terms (676)
- historical notes (697)
- water-level observations (673b, most other 673 files)
- water budget observations (how much goes in, out, and is stored in the wetland) including measurements of creek flow rates (litres/sec, and how to measure flow rates) and calculation of catchment areas that unlike academic papers take account of their unusual nature due to the anisotropic nature of the sandstone fractures on Gabriola (673u, 673t, and not listed [573](#) and [551](#) if you're really interested)
- measurement of rainfall measurements at the marsh and statistical analysis of precipitation records for Gabriola (most 673 files, 698)
- mapping of creeks and wetlands (661, 668)
- lists of the species of plants and animals seen, photographed, and occasionally inexpertly identified (679, most other 673 files)
- thoughts on replacing the weir with a sluice gate discounting the possibility of catastrophic failure of the beaver dam (673y, 673z, 673zb)
- thoughts on a simple re-design of the concrete weir to increase its ability to carry flood water again discounting the possibility of catastrophic failure of the beaver dam (673zc)
- letters on managing the wetland as a nature reserve (680, 690); and
- even a hopelessly-beginner's attempt at a poem reflecting the pleasure that regularly visiting the park brings to me (673zc, pp. ZC 564/5).

Nick Doe and Gabriola Streamkeepers (GSK) Files

- 661. Atlas of Wetlands and Watercourses on Gabriola ([File:661](#))
- 668. Hydrogeology of Coats Marsh, Gabriola Island, 2015-2021 ([File:668](#))
- 673. Observations at Coats Marsh ([File:673](#)) see Binder673 below for supplementary files
- 673b. Summary of water level measurements ([File:673b](#))
- 673t. Notes on evaporation and evapotranspiration ([File:673t](#))
- 673u. Water balance and catchment area calculations ([File:673u](#))
- 676. Wetland and Watercourse Glossary ([File:676](#))
- 678. Freshwater Fish on Gabriola Island ([File:678](#))
- 679. Coats Marsh Species Checklists ([File:679](#))
- 680. Letters and Responses to RDN, POSAC, LTC, GaLTT, GSK, and NTBC on the management of parks on Gabriola Island, BC, Canada ([File:680](#))
- 682. Observing ducks and geese at Coats Marsh, Gabriola Island, July 2017 ([File:682](#))
- 690. Coats Marsh and Surrounding Public Lands Management 2009-2019 ([File:690](#))
- 691. Geology of Coats Marsh area, Gabriola Island, BC—a summary, 2019 ([File:691](#))
- 692. Flora of Coats Marsh area, Gabriola Island, BC—a summary, 2019 ([File:692](#))

- 693. Fauna of Coats Marsh area, Gabriola Island, BC—a summary, 2019 (File:693)
- 697. Brief History of the Weir (File:697)
- 698. Rainfall on Gabriola, 1944-2023 (File:698)
- 6111. Beaver dam stability. Prof. Brazier and Dr. Puttock, University of Exeter (File:6111)

Binder673 Field Observations Binder 2015-2024 (File:Binder673)

This is a very large file (>120 MB) made up of the following supplementary files. The recent files in this list may be more up-to-date than in the binder. Page numbers are numerically continuous in the binder, but the page numbers of 673 files have alphabetic prefixes that identify which individual file they are from. For example p. D123 means page 123 in the 673d file.

- 673d. 2015 (File:673d)
- 673e. 2016 Jan.-March (File:673e)
- 673f. 2016 Apr.-Jun. (File:673f)
- 673g. 2016 Jul.-Sept. (File:673g)
- 673h. 2016 Oct.-Dec. (File:673h)
- 673j. 2017 Jan.-March (File:673j)
- 673k. 2017 Apr.-Sept. (File:673k)
- 673m. 2017 Oct.-Dec. (File:673m)
- 673n. 2018 Jan.-Dec. (File:673n)
- 673q. 2019 Jan.-Jun. (File:673q)
- 673r. 2019 Jul.-Dec (File:673r)
- 673s. 2020 Jan.-Jun. (File:673s)
- 673v. 2020 Jul.-Dec. (File:673v)
- 673w. 2021 Jan.-Jul. (File:673w)
- 673x. 2021 Jul.-Sept. (File:673x)
- 673y. 2021 Oct.-Dec. (File:673y)
- 673z. 2022 (File:673z)
- 673za. 2023 Jan.-Apr. (File:673za)
- 673zb. 2023 May-Aug. (File:673zb)
- 673zc. 2023 Sept.-Dec. (File:673zc)
- 673zd. 2024 Jan.- (File:673zd).

Excellent newspaper coverage by Rachelle Stein-Wotten in the *Gabriola SOUNDER*

- 53. May 10, 2023, 33(19), *Regional parks committee in favour of decommissioning Coats Marsh weir*, p.12
https://simplecirc.com/view_issue/34699
- 54. Oct.11, 2023, 33(41, printed 40), *RDN has Coats Marsh weir decommission design underway following federal approval*, p.7;
https://simplecirc.com/view_issue/38847
- 55. Jan.10, 2024, 34(2), *Draft plans released for decommissioning, restoration of Coats Marsh Weir*, pp. 4-5
https://simplecirc.com/view_issue/41383

Introductory comments

As far as I know, despite now several studies by consultants, the RDN have not considered that it is reckoned by an expert in beaver dams that the beaver dam, in its Coats Marsh lake-like setting, will never fail catastrophically. (Reference 6111; 673b p.B3). Despite this, catastrophic failure continues to be a major concern in their planning. It will of course be breached harmlessly from time-to-time, as it is now, in periods of high rainfall or rapid snow melts, but breaching is not catastrophic failure. Its decay mode, should it be abandoned by the beaver and allowed to rot out, will be the development of a series of breaches over time, each progressively reducing the maximum water level retained. Beaver dams are not like dams that humans build.

In any case, the beaver dam must allow water to flow through it or over it—it is actually a weir rather than a dam. If it didn't allow such a flow, there would be no way for the inflow to the lake, principally from the two creeks at the east end of the marsh (East Path Creek and NE Arm Creek), to exit via the weir into Coats Marsh Creek, and from there flow down to Hoggan Lake and into the sea.

No effort that I am aware of has been made by the RDN to investigate the option of reducing the potential liability for damage or loss of downstream “infrastructure” (mainly a log cabin built before riparian regulations were introduced, not a residential structure). The consequences of failure of the weir are currently assessed by off-island consultants as being HIGH. (Reference 10), which requires among other stipulations that the weir undergo regular inspection. The less onerous options for the RDN yet to consider are SIGNIFICANT and LOW.

No creative ways have been looked at for meeting the intent of the new provincial dam regulations without resorting to building a heavy-duty, high-cost, new dam, and demolishing the beaver dams and presumably heavy-handedly re-locating the beaver to prevent him re-building his dams. The original builders and park donor would have despaired.

There is a video recording of the RDN Regional Parks and Trails Select Committee meeting on May 2, 2023, (Reference 7) in the list below at which the recommendation to demolish the weir was made.

One aspect of the difficulties in dealing with this issue is that the RDN and Gabriola Islands Trust LTC are not traditionally organized to recognize the sometimes-sharp distinction between a “park”, managed primarily for human recreational purposes, and a “nature reserve”, managed with the needs of wildlife having, as near as is practical, absolute priority. See for example letters to the LTC from IT Trustee Susan Yates (Reference 680, pp.29/30, November 27, 2023), *former* IT Trustee Deborah Ferens (Reference 680, p.30, November 28, 2023), and myself (Reference 680, pp.28-29, July 9, 2019) on the LTC's long-standing failed attempts to put ecological protection zoning into their toolbox. In the same thread, GaLTT (Reference 680, pp.30/1, November 27, 2019), which has an unusual mixed mandate to develop trails and to foster conservation, declined to support giving ecological protection zoning to Coats Marsh RP. Currently, Gabriola does not have any ecological areas protected by IT zoning.

Reserving selected natural areas with limited, if any, opportunities for human recreation is not always favoured by everyone (we the taxpayers pay for it and are thus entitled to go there) despite generally held opinions to the effect that considering the environment is an important aspect of land use planning. The notion that compromises are always possible is not true; human

disturbance and anthropocentric management of an area almost always has some impact, usually negative, on the wildlife that would have thrived there had it and its habitat remained without human influence.

Most of what has been written about the weir, starts with the assumption that what is being dealt with are concerns about “regulations” and “liability”, not what is the best we can do for this small portion of the natural world. Badly needed in discussion about the future of the marsh is its status as a nature-reserve, not as if it were similar to an industrial-grade impoundment, and a feeling for the beauty of its “tranquility”, a word donor Clyde Coats used several times in remarks made at the opening ceremony of the park one sunny day in the May of 2009.

Technical and terminology details

I use “lake” in these notes, some people use “pond”, it is technically a “shallow-water wetland”. The latest NHC report ([Reference 10](#)) calls it a “reservoir”, a term I have never heard used on Gabriola, but which is perhaps in keeping with their general approach to managing it.

Despite references to beavers (plural) and beaver family, there is, and has only ever been, one beaver active in the lake, a male judging by the absence of kits, and he is not always present being accustomed to take occasional breaks for a few weeks, likely down to Hoggan Lake. He probably was introduced into the Coats Marsh lake around the turn of the century by Clyde Coats, though this is not certain. It is however, I gather, not unusual for a beaver to lead a solitary life in this way.

Fish. There are no fish in the lake, but Jethro has seen trout in the deep pools up to a hundred metres or so on the upstream side of the South Road culvert in Coats Marsh Creek. The official Riparian Area Regulations (RAR), which are incomplete, are wrong on this. ([Reference 3](#)); however it is true that the way from there upstream is not passable by fish. One of the consequences of the absence of fish is that the wetland supports a large variety of species of dragonflies, whose nymphs would otherwise have to compete with the fish.

By “beaver dam” most people are referring to the dam spanning the 30-metre width of the lake, about 60 metres upstream of the weir. No part of this dam has ever been removed. There is however a smaller earlier dam immediately adjacent to the weir. At times in past years it has looked like an unorganized collection of debris, but more recently the beaver has been developing it. ([Reference 673zc, pp. ZC561/3](#)) It is this smaller dam that older comments like “removal of the dam” are referencing. Despite the beaver’s attention I sometimes continue to call it “debris” knowing full-well the beaver would disapprove.

The major dam splits the lake into two unequal parts.

The larger part of the lake east and upstream of the major beaver dam is known by locals as the “outer” part of the lake, less often as the “east end”. I’m in the habit of calling it the “outer” part too, but sometimes have taken to just calling it the “lake” in field notes when the context is clear that it is only the outer part of the lake that I’m referring to.

The smaller portion on the downstream side of the larger dam, the embayment, has been called by several names; I’m currently using “weirpool”. It is the weirpool that the RDN are proposing to drain by removing the weir and the beaver’s subsidiary dam (the debris) that is butting-up against the baffle of the weir.

Water level measurements are made by consultants relative to mean sea level (AMSL) while my own have been relative to the top of the concrete columns comprising the weir (CWB=concrete-weir baseline). CWB is 97.0 metres AMSL. (Reference 26) RDN's water-level observations have never been published and may only apply to the weirpool. Records do exist of water levels prior to 2015 but they have not been normalized to CWB and are not in the possession of the RDN. The RDN appears not to have any records of levels before 2015 from any source. If they do, they have not made them available to the public.

Although called a “marsh” there is a technical distinction between a marsh and a swamp. Marshland is generally considered to be land that would be populated with grasses and forbs (small shrubs) if dry, swamps by trees. Some species of ducks prefer one to the other.

Coats Marsh shows aspects of both, but the species of duck and other waterbirds most commonly there seem to regard it as more of a swamp than say Dicks Swamp on the Boultons' Somerset Farm, which paradoxically is more of a marsh. Wood ducks (*Aix sponsa*) for example are fairly common at Coats Marsh, while northern pintails (*Anas acuta*), occasionally seen at Dicks Swamp, have never been seen at the marsh. However, because of the unusual geology of the lake, it is unlikely trees of any size could grow there, even if it were dry. It would be a sandstone plain with only a relatively thin layer of soil populated with mosses, grasses, forbs, reeds, and shrubs like roses and stunted willows, or perhaps to be pessimistic (or perhaps realistic), almost monotypic habitat dominated by reed canary grass as is the NE Arm and Canary Grass Meadow.

Old history

Several accounts of the history of the marsh exist on the websites of the RDN and GaLTT, most of which is not relevant here, but I have to include mine (Reference 697) because some people refer to “restoring the marsh to its historical state” as an objective, when the “historical state” has been cherry-picked to suit the writer's perspective. For example, the lake was once drained and used as a pasture evidenced by the barbed-wire fence completely surrounding it, remains of which still exist, and by a concrete cistern for watering livestock at the east end. A valid “historical state” if you're a farmer.

July 20, 1872. The earliest maps we have of the marsh are in the two pre-emption claims of land by the Hoggan brothers. David Hoggan's claim shows a lake (Hoggan Lake), and William Hoggan's claim shows a swamp (Coats Marsh).

1874/5. A survey map shows the NW¼ and NE¼ of Section 10 owned at the time by William Hoggan. Coats Marsh is outlined and shown as unforested swamp in the centre, straddling the two quarter-sections as it does today. Early maps were careful to include swamps because land unsuitable for agriculture did not count toward the area being pre-empted. East Path Creek is traceable on the map all the way back to McGuffies Swamp, but no similar outlet (Coats Marsh Creek) from the marsh down to Hoggan Lake is apparent. (Reference 661)

ca. 1940. Draining the swamp for agricultural purposes was accomplished by blasting and trenching a deep narrow gully, a fissure, through the sandstone ridge at the west end of the lake. This was probably done by Bill Coats who acquired the land in the early 1940s after a massive wildfire in the summer of 1938. Bill also owned the millstone quarry in the 1930s so he would have had access to gunpowder.

ca. 1968. According to Gordon McDonald, the fissure was blocked by a 20-foot-wide weir. This weir had two concrete columns bonded to the sandstone and spanning the fissure except for a

2-foot-wide gap mid-way between them. This gap was closed by a baffle, a simple sluice gate, which consisted of 2 X 12-inch wooden planks stacked one on top of the other and held in matching vertical grooves in the columns and sealed by the pressure of the water. The height of the baffle could thus be adjusted, a foot at a time, by adding and removing a plank to either hold back water or allow water to drain through the gap into the creek. Because the fissure is over three metres deep (10 ft.), removing all the boards allowed the marsh to be drained completely, but in his day, Bill was often frustrated by the island's duck hunters who for their own reasons preferred to keep the baffle stacked with planks and the marsh flooded. There was talk at one time of the area being used as a cranberry farm but that remained just an idea.

1968-ca.2002-5.

For a period when it was a meadow and pasture, there were radio antennas there, and you still come across junk if you auger down through the bed of the lake. The weir remains today much as when it was first constructed. Clyde Coats, Bill's son, used it or planned to use it to drain stored water down into Hoggan Lake to augment his hydro-electric power generation plant. The idea for making it a park was formulated in 2005 by the now-defunct Gabriola Land Conservancy.

2008. The now re-flooded marsh was acquired from the Coats family through a donation of half its value by owner Clyde Coats and a partnership between the Nature Trust of BC, the RDN, and the BC Trust for Public Lands (Environment Canada Ecological Gift program).

May 22, 2009. Official opening of the park [Joe Stanhope RDN; Gisele Rudischer, Regional Director; Doug Walker NTBC; Leigh Ann Millman; Clyde Coats]. "That park (the 707 CP) should satisfy a great deal of recreational needs, leaving Coats Marsh with its sensitive wetlands to thrive as wildlife habitat". Gisele's comment.

THE FLYING SHINGLE, Vol. 37 (11), p.2, June 5, 2009 and *Gabriola* SOUNDER Vol. 19 (21), p.1, May 25, 2009 Clyde Coats comments indicate that there was already a beaver present in the park.

October 2009. A beaver-proof Clemson 8-inch pond leveller was installed after the then topmost baffle plank was removed. The debris/dam accumulated just a few metres upstream of the baffle was removed. This was to eliminate flooding of private property (Lot 5).

2012. GSK founded. Initially not involved in wetlands on Gabriola. I did not start reporting on Coats Marsh until 2015, which I visited often, when I realized that the RDN had not been doing any monitoring or data gathering.

GSK members continue to monitor the water quality of Mallett Creek and GSK is listed as a stakeholder in the Coats Marsh weir project. (Reference 10).

February 2012. Riparian Area Study of Gabriola by Madrone Environmental Services. Omitted to talk to locals and so made several mistakes including speculating that there are no fish in the lowest reaches of upper Coats Marsh Creek. (Reference 3)

2013. When the pond-leveller proved inadequate to control the flow of flood water, a berm was built over the low-lying land to the south of the weir, raising the surface there 0.3 metres above the top of the weir. The tops of the columns were at that time connected with a wooden walkway known now as the "deck", or less often "bridge" founded on beaver debris dredged from the weirpool. Although the deck has several times been flooded, the berm has never been breached. (Reference 4)

2014. In March, there was the largest flood ever experienced in historical times. The downstream cabin had water flowing beneath it but no damage was done because it is built on stilts. No flooding issues were reported by any of the downstream landowners. (Guy/Cheryl, Donna, and Mark)

Newer history

June 1, 2020. Qualified engineering study of the integrity of the weir (Reference 5).

[Comment: The local residents have not observed any deterioration in the concrete weir for the last 20+ years.]

Comments:

Quote: “Because the weir is located on a stream, the government of BC will likely require it to be licensed under the BC Water Sustainability Act and, if so, will require it to be registered under the BC Dam Safety Regulation (DSR). Further, if registered under the BC DSR, the weir will require operation, maintenance and surveillance activities according to its dam failure consequences classification, which we view as “significant”.

[Comment: The weir does not have a water licence, but is currently regulated as a dam under the Water Sustainability Act and the BC Dam Safety Regulation (B.C. Reg. 40/2016) Reference 9].

“The weir was inspected on May 1, 2020 and found to have notable deterioration. Inspection of the conditions upstream and downstream of the weir carried out on the same date identified a number of risk management issues that need to be considered by the RDN.

“Priority recommendations for action include:

- immediately investigate lowering the level to the “design” weir spill level through installation of an appropriately sized Clemson pond leveller through the beaver dam and, if feasible, install the pond leveller before the fall 2020 rains

[Comment: A siphon system was installed in lieu of the suggested pond leveller. Reference 6]

- immediately remove the beaver debris piled in front of the Coats Marsh Weir and footbridge, as well as the vegetation buildup

[Comment: Removing the debris is not as simple as it sounds. It is not unconsolidated sandy material that constitute the “sediment” piled up against the upstream side of the baffle. It is a mix of compacted fines and organic material (mud, wood, and vegetation). Removing just the surface material would enable the beaver to quickly repair the damage.

Build-up of the water level in the weirpool as a result of this small dam has not been a problem because as soon as it is breached and the level exceeds CWB, the effective width of the sill is increased tenfold (from 2 to 20 ft., 0.6 to 6 m). This slows down the rise in water level to the extent that it has never yet gone on to breach the berm.

(Reference 673zc, pp. ZC561/2)]

– investigate raising the park pathway footbridge adjacent to Coats Marsh Weir and, if feasible, complete this work before the fall 2020 rains

[Comment: Not judged to be worth the effort. There is no access by pedestrians to the south side of the lake because allowing that would seriously disturb the habitat of species of duck that use tree cavities for nesting besides alarming ducks when they are moulting, flushing transients who are resting there in the migration seasons. Butternuts Marsh in Nanaimo, which is completely surrounded by a well-used trail, is not how we want the lake to become. Not completing an around-the-lake trail as proposed in the Coats Marsh Management Plan ([Reference 1, p.18](#)) needed some persuasion by GSK greatly assisted by the GaLTT.

The deck does indeed impede the flow of floodwater, but the degree that it does is hard to estimate with confidence.]

– engage with the government of BC to determine if they require the Coats Marsh Weir to be licensed under the Water Sustainability Act and if so proceed with registering the weir under the Dam Safety Regulation.

[Comment: so far as I know, done.]

Sept. 14, 2021. Proposed strategy for water level management ([Reference 6](#))

Recommendation to install a siphon system across the beaver dam as an alternative to pushing a Clemson Pond Leveller through the dam. This proposal was implemented.

[Comment: the RDN regards the siphoning system as a success. I most assuredly don't. The need for periodic maintenance disturbs the wildlife, which together with the severe yo-yoing of the water level of the lake may account for the significant drop in the number of ducks and other waterbirds, including breeding pairs, using the marsh since it was installed. It is important to not draw down the water level to a point where there is insufficient water in droughty summers to make up for evapotranspiration, which may amount to 5mm/day. The lake was inadvertently drained by the siphons in the summer of 2023 and the negative consequences readily observed. ([Reference 673zb; 673zc](#)). I suppose if I were legally-minded, I might suggest that asking staff to go out on the dam to make regular inspections of the siphons could be conjectured as putting them in danger given that the RDN is of the opinion that the dam might fail catastrophically.]

April 12, 2023. NHC report ([Reference 9](#))

All of the five scenarios enunciated in this report include completely removing both of the beaver's dams. It was rapidly dismissed as being unacceptable for a nature reserve.

Given the need to address the weir structure's deteriorating condition, quote:

the objective of this study was to determine the engineering and environmental implications of modifications considering the following five elevation scenarios:

Scenario 1. A replacement dam at an elevation that precludes the need to build a new embankment structure [berm] along the west side of the weir pool (elevation 96.1 m)

[Comment: 96.1 m = -0.90 m CWB. The berm is at +0.30 m CWB. Essentially just rebuilding the concrete weir with a wider spillway and lowering the water level in the lake. Bern retained. Capital cost \$390 k.]

Scenario 2. A replacement dam at the same elevation as the existing weir overflow flashboard (elevation 96.4 m)

[Comment: 96.4 m = -0.60 m CWB. Wider spillway. Replacement berm. This elevation is arbitrary and was lowered when the pond-leveller was installed. It does not define the summer water level in the weirpool because evapotranspiration causes the level to drop below that, nor does it define the winter water level on account of the beaver's debris. The berm would need to be replaced. Capital cost \$590 k.]

Scenario 3. A replacement dam at an intermediate elevation between the existing weir overflow and the top of the site's beaver dam. This has been set as the top elevation of the existing weir concrete (elevation 97.0 m)

[Comment: Comment: 97.0 m = 0.0 m CWB. Wider spillway. Replacement berm. Capital cost \$740 k.]

Scenario 4. A replacement dam at the same elevation as the beaver dam (elevation 97.7 m)

[Comment: 97.7 m = +0.70 m CWB. Wider spillway. Replacement berm. Capital cost \$1.08 M.]

Scenario 5. Removal of the existing weir and decommissioning of the dam structure

[Comment: Resulting in complete drainage of the marsh and probable loss of beaver habitat. Capital cost 435 k.]

"NHC provided a dam consequence classification review in accordance with provincial guidelines, including an inventory of downstream assets and a qualitative assessment of potential consequences in the event of a dam breach. We recommend a preliminary classification of **High Consequence** for the existing weir due to potential for loss of life at a cabin located on private property at 1040 Coats Drive. [Comment: a recommendation apparently accepted by the RDN without as far as I know any public comment.]

"The beaver dam upstream of the weir appeared to be actively maintained by beavers, with no overflow channels or breaches identified. [Comment: Mis-information. In high water situations there are always several spillways on the dam with a capacity far greater than that of the siphons, and the beaver uses these in normal situations to move back and forth across his dam.]

"However, the beaver dam impounds water above the existing weir and berm. This arrangement is contrary to current dam safety practices for a regulated structure, regardless of the real or presumed stability of the beaver dam. NHC recommends beaver dam removal under all scenarios. [Comment: .. and beaver or any successor(s) removal to avoid them being rebuilt. Completely inappropriate for a nature reserve.]

"The most technically straightforward approach is for RDN to form an agreement with the land owner to carry out one of the following actions: 1) removing or relocating the cabin to another area of the property, or 2) removing the unlicensed stacked rock weir adjacent to the cabin, thereby greatly increasing the channel capacity and reducing flood levels at the cabin. [Comment: RDN has, as far as I know, have never discussed this as recommended. The flow of Coats Marsh Creek to Hoggan Lake is mostly through undeveloped woodland and a small wetland and absorbs floodwater harmlessly.]

From the perspective of the non-human population of the park, the most favourable scenario is missing. Scenario 6: Just go away and leave it alone.

April 12, 2023. EDI report (contained in Reference 9 and updated in Reference 10)

While a reasonable assessment of the environment of the marsh, it contains some information that is not correct or incomplete, but to be fair, could not reasonably be obtained from observations made solely on one or two ferry-in/ferry-out visits at one particular time of the year. By “area” I am sometimes including the riparian area of upper Coats Marsh Creek that extends from the park through private property. Comments:

The concrete weir structure was constructed more precisely *circa* 1968, not sometime between the late 1960s and 1980s.

The site classification Western Red Cedar–Indian Plum is incorrect. It is based on an interpretation by a forester of aerial photographs, made years ago. This Sensitive Ecosystems Mapping (SEM) system lacks any reference to the disproportionately important small riparian areas. It has become of very limited value as a planning tool. The dominant site species in the uplands area are Douglas-fir (*Pseudotsuga menziesii*), oceanspray (*Holodiscus discolor*), and salal (*Gaultheria shallon*); within the riparian area the species are red cedar (*Thuja plicata*), ninebark (*Physocarpus capitatus*), and sword-fern (*Polystichum munitum*).

The dominant aquatic plant species in the marsh is not water smartweed (*Persicaria amphibia*). Though patches of water smartweed do exist, the dominant species is watershield (*Brasenia schreberi*). This is of some relevance because these plants are rooted in the bed of the lake and both have limited but differing tolerance to deep water. Having some of the lake’s surface remaining open in summer because of its depth affects the ecology because some duck species (lake ducks) require open water in order to gain flight.

It is close to certain that there are no fish in the lake. Various reasons, including the facts that species of waterbirds that rely on fish for food are all either absent (no resident kingfishers, herons, common mergansers, etc.) or only very rare visitors for no more than one or two days per year. No fish or fish fry have ever been caught by Gabriola Streamkeepers in traps, no rises after hatching flies have even been observed, and no dead carcasses have ever reported. Complete drainage was the norm in historical times.

East Path Creek is not the largest source of inflow at all times in the wet season. Later in the season, outflow from the North East wetland into the lake sometimes exceeds the flow in the creek.

I do not see any discussion on the ecological value of the weirpool itself as distinct from the wetland as a whole. One difference for example is that in winter when the lake is frozen over, the weirpool tends to remain as a refuge for the waterfowl by virtue of staying ice-free on account of the movement of water through to the weir. There are occasions when the population of swans and ducks in the weirpool is greater than that in the lake. I have in the past observed breeding pairs of ducks in the weirpool, which is perhaps more sheltered from owl, eagle, and hawk predators, but not at all recently.

The negative effects of the yo-yoing of the level in the lake is not addressed. The siphoning system installed by RDN that causes this does not perform any useful function. Despite severe drawdown of the water level a few days of heavy rain in the wet season very quickly restores the water levels.

The 16 species of wading birds, swans, geese and waterfowl listed as occurring within the Coats Marsh area taken from ([Reference 690](#)) omits information on how often these species are observed. Some species are so rarely seen they don’t warrant inclusion in this list. A

more complete source, regularly updated, is (Reference 679) which ranks them as being abundant (A); common (C); frequent (F); occasional (O); rare (R); exceptionally rare and unlikely once more common (X); local, absent elsewhere (L); not in any Gabriola species checklists (*); not in either the Coats Marsh RP nor 707 CP Management Plans (†); exotic species (+); and not seen for five years or more but possibly once more common e).

I would remove: gadwalls (possibly a mistaken ID), ruddy ducks (very rare brief transients), snowy owl (an exceptionally rare observation), belted kingfishers (very occasionally seen for brief visits when they feed on frogs. Leaving them in the list suggests to the reader there might be fish in the lake, which there aren't).

Nesting concerns should include the cavity breeders, wood ducks, hooded mergansers, and until recently, observations that occasionally a pair of buffleheads linger into late spring.

It has to be stressed that nearly all species of waterfowl that use the lake are extremely sensitive to disturbance because of the smallness of the lake and thus high visibility of human intruders.

Although there is no cause-and-effect linkage, it is striking that the number of species breeding there has declined in recent years, and that winter populations are just a fraction of what they used to be. Claims by the RDN that their staff have circumnavigated the marsh to monitor possible damage to the environment make no sense when you appreciate how easily the waterfowl residents are put to flight. I can only get good photographs of the ducks by sometimes literally crawling through the bush. Equally, insensitivity to the effect of disturbance has been demonstrated by co-owners NTBC who have flown a drone over the lake, something which ought not need to be banned but evidently does need to be.

Reference to WHA re-frogs is an error. WHA only applies to provincially-managed Crown land, not parks. Northern red-legged frogs are common both everywhere in the wetland and in the riparian areas of Coats Marsh Creek.

May 2, 2023. Staff Report to Regional Parks and Trails Select Committee ([Reference 8](#))

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

| PROS | CONS |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> — This is the preferred project scenario from the Nature Trust BC. — Removes built infrastructure from the park. — Reduces operational costs associated with maintaining a regulated dam structure. — Comparatively low capital cost. — Retains the aquatic ecosystem in its present state upstream of the beaver dam. — Comparatively low site impacts from construction activities. | <ul style="list-style-type: none"> — Regulatory uncertainty. The province expressed willingness to accept and review this project but has not committed to approval. — Liability uncertainty. The RDN would most likely retain liability associated with keeping the beaver dam in place. — 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. — 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. — A failure of the beaver dam would also drain Coats Marsh and may result in the requirement for environmental restoration work. |

The last CON is a *dandy*. Surely an error. We're talking about complete destruction of the ecosystem as we know it.

Further quotes not needing comment:

“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.

“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.”

May 2, 2023. RDN Parks and Trails Committee Meeting, May 2, 2023 (Reference 7)

Regulatory approval having been obtained, the presented Staff Plan was adopted after some interesting discussion of the issues.

December 18, 2023. NHC report (Reference 10)

Currently, the preliminary scope of dam decommissioning includes the following elements:

- leaving the existing upstream beaver dam in place to maintain habitat value
[Comment: excellent.]
- removal of the existing weir and appurtenant structures, including the existing berm
[Comment: no more weirpool and only the beaver dam remaining to prevent the marsh from being completely drained. For anyone uncertain of the extent of the drainage in the weirpool they should note that the proposed level of what would be the new sill is -2.00 m CWB. The lowest ever observed is -1.18 m on September 19, 2023, photographs of the consequence are in Reference 673zc, p.ZC573.
Removing the berm appears only to be a regulatory requirement, there only to prevent it being used, or regarded, as a final resource for flood control. If the weir is rebuilt to “code” why is this cautionary measure needed. It just adds to the cost.]
- construction of a grade control structure at the marsh outlet to mitigate complete drainage of the marsh, which would otherwise occur due to historical lowering of the marsh outlet channel
[Comment: not exactly clear to me. The drainage channel running the whole east-west extent of the lake presumably down to bedrock was dredged by Bill Coats in order to reduce flooding in his pastures/hay fields. Allowing the marsh to flood by blocking Bill’s ditch is no substitute for retaining the wetland as it has become. Far too shallow.]
- construction of an overflow channel adjacent to the main outlet channel to better manage water levels near private property boundaries, and
[Comment: Without apparently releasing the RDN from liability due to flooding.]
- revegetation planting with native species.
[Comment: What’s to prevent the spread of reed canary grass?]

Any quantitative assessment of risk usually involves two factors, the probability of an event happening multiplied by the consequences should it happen.

I can only repeat regarding the first factor my conversation with Professor Richard Brazier of Exeter University who has been researching beaver dams in the UK since 2013 that:

“Considering the system that you refer to - which is a low energy lake system, in my opinion, especially given the maturity of the dam, the chance of any catastrophic failure is non-existent”. (Reference 6111)

The second factor is the business of the three downstream landowners on liability and its magnitude but I gather no in-depth discussions with the RDN have occurred.

A risk assessment has thus yet to be made.

January 10, 2023. NHC report (Reference 11)

Further to risk assessment, when either the probability of an event happening is low but the consequences should it happen are high, or, the probability of an event happening is high but the consequences should it happen are low, the numerical value of the overall risk (a big number multiplied by a small number) usually becomes somewhat subjective and only useful for comparative purposes.

You also need to distinguish between risk to an individual from risk to a responsible agency. (The risk of me being injured in a car accident driving from Vancouver to Whistler is very small because I hardly ever go there any more, but the risk of somebody (anybody) suffering the same misfortune is high enough for MOTI to give it a great deal of attention).

[Comment: I don't have the qualifications to critique the NHC Risk Assessment but it does seem to focus unduly on the low-probability : high-consequence end of the spectrum. At least two of the selected references deal with catastrophic failure in steep-alpine environments ([Case et al. 2003](#); [Hillman 1998](#)), while a third (Alan Puttock 2019) (Reference 6111) records that in the UK between 2014 and 2019 there were no catastrophic failures of beaver dams in low stream-power sites (order 1-4, like Coats Marsh).

For a breach (meaning loss of a section of the dam 5 to 10 metres wide down to bedrock), the report estimates a 200-year storm peak marsh inflow of 4.54 m³/s (4540 L/s) for 5 hours, and a flow at South Road of 21.5 m³/s (21,500 L/s) due to dam failure.

Just for reference, I've never observed more than around 600 L/s leaving the marsh when the weir was flooded. And flooding is sometimes due to rapid snow-melt rather than concentrated high rainfall.]

Final comments

I am finding it very difficult to comment in more detail on the latest proposed plan. The objectives are essentially meeting stringent provincial government standards for dam construction with limited or unexplored flexibility, and limiting RDN liability in the event of a catastrophic beaver dam failure without considering that a more realistic assessment of beaver dam stability would lessen the need for such extreme flood control measures. Little has been done to explore keeping the cost below what the liability actually is or could become.

The whole planning process that has led to this point has been done by the RDN without, as far as I know, involvement of Gabriola Island stakeholders. It's difficult for me to concentrate comment on this latest plan without implying acceptance of all prior recommendations and decisions which I had no part in making. In my view, insufficient attention has been paid to establishing an environment involving the beaver(s), but without depending on them alone to ensure the long-term survival of the marsh to at least as it was before it was drained in the mid-20th century, and without having to constantly undo their dam building and re-building efforts.

And above all, I have the strong feeling that appreciation of the non-monetary and spiritual values of the marsh have not been given priority over more tangible concerns either by the RDN or its consultants. The consultants have done their commendable professional best to follow the

in-my-view flawed mandate they were given and within undoubtedly time and fiscal constraints. However, “preserve and protect” is the island’s governance mandate.

My obvious and unconstructive preference is Scenario 6: Just go away and leave it alone.

Nick Doe

From: [REDACTED]
To: [Jordan Vander Klok](#)
Subject: GABRIOLA Coats Marsh biodiversity values, FN obligations
Date: Thursday, January 25, 2024 2:39:40 PM

You don't often get email from [REDACTED]. [Learn why this is important](#)

EXTERNAL Verify links before clicking.

Thank-you Jordan for your public info session.

I offer my brief suggestions which your consultants can follow up upon for greater details.

First, increasingly, there is global recognition for the need to safeguard our planets biological diversity as an important component of climate solutions.

Second, Protection and revitalization of the current severely degraded local ecosystems to support restoration of ecosystem elements, thus enable the vitality of First Nations cultural and societal roots is an obligation and moral responsibility.

Third, Gabriolans choose live on Gabriola for reasons, all related to the belief that islands protect nature.

So, I suggest, that while I support the revegetation scheme, it could be done in the light of ecosystem resilience and revitalization.

Before continuing I need to say that I have more than 60 years of nature observations and a geography degree. As well I have birded and examined the vegetation surrounding the marsh and local area throughout one year.

The plantings suggested are at best a reflection of the present degraded marsh.

Where in future as a basis for biological diversity recovery, it fails.

I trust this is the goal for a Nature Trust property, in line with other Nature Trust restorations ongoing in our region.

Instead, plantings, that reflect a warmer drier climate, fruit, berry and nut producing species as well dense low growing shrubs provide more varied habitat offers resilient vibrant ecosystems. Should you wish more details on species, please respond.

Thanks

[REDACTED]

From: [REDACTED]
To: [Jordan Vander Klok](#)
Subject: COATS MARSH species noted
Date: Thursday, January 25, 2024 5:11:23 PM

You don't often get email from [REDACTED] [Learn why this is important](#)

EXTERNAL Verify links before clicking.

Hi Jordan,

Here is a list of some species about the area which should be supported

<https://acrobat.adobe.com/id/urn:aaid:sc:VA6C2:07954d1e-cfc9-47cf-93e4-b8a7986891bb>

Butterflies

Garry oak butterfly, last see. At Hogan lake, requires Quercus garryana plantings near water

Vancouver Island Ringlet requires grasses near water

Saras Orangetip

Red Admiral requires stinging nettle

Lorquins Admiral requires cottonwood

Mylitta Crescent requires willows

Anglewings

Coppers

Skippers

Mourning cloak

Elfins

Blues requires oceanspray, lupines

Swallowtails needs willows, carrot family

Wood nymphs

Arctic

<https://acrobat.adobe.com/id/urn:aaid:sc:VA6C2:6a7db0bf-5914-4059-8edc-023f68ac7146>

Birds

Many small passerines, sparrows, wrens, towhees, juncos are ground nesters, dense thickets offer necessary cover and wind breaks

Flycatchers, seen, use a variety of perches at different heights

They will nest in deciduous willows, cottonwoods, aspens.

https://www.richmond.ca/__shared/assets/Birds_Brochure29759.pdf

Herptiles and insects as well as birds require open dry sand ridges

this habitat could be contoured on the high ground from construction materials.

Hoping this will help in your plans for a vibrant rich diversified interconnected riparian system at the Coats Marsh restoration site.

Sincerely, [REDACTED]

From: [REDACTED]
To: [Jordan Vander Klok](#)
Subject: Inclusion on any planting to ensure culturally significant plants incorporated •FN food and useful plants. Biodiversity can be strengthened with a wide plant base
Date: Friday, January 26, 2024 11:32:06 AM

You don't often get email from [REDACTED] [Learn why this is important](#)

EXTERNAL Verify links before clicking.

Hi Jordan,
Plant listings
Stinging nettles
Clovers, white clover *Trifolium wormskioldii* springbank clover, tom cat are the most important plants for all reasons.

In planting, provide diverse materials that support continuous traditional culture.
Garry oaks are the most important trees for they are the trees of the past landscape, see Parks Canada, Peltier, M., 2018, et al.
FN reference, Dr. Nancy J Turner, Luchims Plants, 2022.
Generally,
In any opening, plant species, ie,
Q garryana, cottonwood, aspen, cascara, saskatoon, mock orange flowering shrubs, that require higher sun exposure to survive.
Where pioneer species are needed choose a greater variety of species which create dense, nutrient rich habitat for the widest range of native species, stinging nettles, willow sp,
Species irreplaceability is a measure of the conservation value of a site (Pressey et al. 1993), which is based on the number of times that a particular site occurs in a combination of sites that represents the biodiversity of interest within the region.
I have studied riparian zones within the local area.

Plant for increasing invertebrate and vertebrate diversity

trembling aspen *Populus trichocarpa* black cottonwood *Saxix hookeriana* Hooker's willow
Salix scouleriana Scouler's willow *Salix sitchensis* Sitka willow
Pacific dogwood, cornus.

Recommended riparian plantings from City of Nanaimo Millstone River
Myrica californica *Physocarpus capitatus* *Polystichum munitum*
Ribes sanguineum *Symphoricarpos alba*

red columbine *Delphinium menziesii* Menzies' larkspur *Ranunculus occidentalis* western buttercup

Frangula purshiana cascara
Amelanchier *alnifolia* Saskatoon berry, serviceberry *crataegus douglasii* black hawthorn,
Fragaria vesca woodland strawberry *Fragaria virginiana* blue leaf strawberry *Geum macrophyllum* large-leafed avens
Holodiscus discolor ocean-spray
Malus fusca western crabapple *Oemlaria cerasiformis* osoberry *Physocarpus capitatus* Pacific.
Prunus emarginata bitter cherry *Prunus virginiana* var. *demissa* chokecherry bald hip rose
Rubus nutkanus (parviflorus) thimbleberry *Rubus spectabilis* salmonberry
mountain ash

plantain *Plantago maritima* seaside plantain
Douglas' aster
speedwell *Veronica* marsh speedwell
streambank springbeauty
Claytonia perfoliata miner's lettuce *Claytonia*
marsh violet, all violets
marsh cinquefoil
Erythronium oregonum easter lily *Fritillaria affinis* (lanceolata) chocolate lily
Lilium columbianum Columbia lily, tiger
red currant
Mock orange
mountain sweet-cicely
Osmorhiza purpurea purple sweet-cicely
Sanicula crassicaulis Pacific sanicle
coltsfoot
common yarrow
Adenocaulon bicolor path-finder
skunk cabbage
Pacific bleedingheart *Erythranthe alsinoides* chickweed monkey-flower *Erythranthe guttatus*
yellow monkey-flower
Blue-eyed Mary
Cheers

