

Project Brief
April 12th, 2023

FROM: TransCoastal Adaptations: Centre for Nature-Based Solutions AND; CB Wetlands and Environmental Specialists Inc.

RE: Barriers to Nature-Based Solutions on the Eastern Shore of Nova Scotia

GOAL: To highlight the permitting barriers to implementing Nature-based Solutions (NbS), and to clarify the intent of the implementation of NbS in Nova Scotia.

In late 2020, CB Wetlands & Environmental Specialists (CBWES Inc.) was approached by a landowner concerned about erosion on their recently purchased property on the Eastern Shore of Nova Scotia and interested in exploring nature-based solutions (NbS) as an alternative to continuing the already existing hard armouring on the lot. After extensive assessment and consultation, a suitable nature-based design was created, and appropriate permit applications were submitted.

CBWES has experienced difficulties and barriers throughout the permitting process, including inadequate options to accurately represent the project and discrepancies between regulatory agencies. From this process, it is also apparent that there are vast differences in the way that nature-based vs. traditional shoreline armouring approaches are handled in Nova Scotia, with the path of least resistance leading to hard armouring. Barriers to implementing NbS leave homeowners with few options to protect coastal properties and are not in alignment with recent provincial statements on climate change adaptation (NS, 2022).

Nova Scotia Needs Nature-Based Solutions

With 13,000 km of coastline (over 85% of which is privately owned (CBCL, 2009)) and some of the highest projected levels of sea rise across the country, the effects of climate change are already being seen around Nova Scotia (NS, 2022). Sea level rise, coastal erosion and flooding are issues being faced by many of the 70% of Nova Scotians who live within 20 km of the coast (NS, 2019). With the introduction of the Coastal Protection Act, the province has shown that it recognizes the need to address coastal climate change adaptation. The recent Climate Change Plan and risk assessment show the recognition of the role of nature-based solutions in coastal climate change adaptation (NS, 2022).

Nature-based Solutions

The most common methods for shoreline protection along the Nova Scotian coast involve hard armouring measures which can significantly disrupt natural shoreline processes. Hard

armouring methods are considered routine, and it is therefore relatively simple to obtain the required permits and construct. Hard armouring methods are not climate resilient and may not be suitable for every shoreline. They may impede shoreline access and can negatively impact natural coastal processes and habitats and result in loss of beaches.

Alternatively, nature-based solutions are methods that work with natural shoreline processes. They harness the functions of natural habitats to both manage coastal erosion and flooding and mitigate climate change effects. NbS such as living shorelines help increase shoreline stability and resilience, while sustaining natural habitats and respecting environmental processes. NbS are also cost effective as they are intended to be highly resilient and self-strengthening over time, reducing costly maintenance and repairs associated with hard armour structures as they age, degrade, or suffer storm damage.

Project Overview

The lot in question is predominately on the South-west side of a southern facing headland, and the shoreline can be divided into 2 general parts:

1. The southern side is an exposed drumlin headland with two-tiered hard rock armoring (likely placed and/or reinforced around 2006-2007 based on historical imagery);
2. Northwest of the armoring is a sheltered cobble beach and cobble barrier. The back shore to this section is an eroding bluff that transitions to a cobble berm protecting the upland bank.

After extensive field and desktop assessment and analysis, CBWES was able to estimate erosion rates and changes over time, including from pre-access road construction (~2002) and armoring (~2006) until the present. The bank had been relatively stable until 2003 when destabilization occurred, likely due to Hurricane Juan. Between 2006 and 2017, the erosion rate increased dramatically, with the bank eroding at an average rate of more than 1m annually.

There are three main issues at the site that were determined to contribute to bluff erosion, and that need to be addressed to achieve a more stable shoreline; 1) bluff erosion via piping and sub-aerial processes; 2) increased erosion from wave refraction around the armoured point; and 3) a lack of sediment supply due to headland armoring.

Approach

The original conceptual design by CBWES addressed the bank erosion by creating a living shoreline that included: bluff grading and revegetation (addressing piping and slumping) and extending the rock armoring out into a submerged wave break (addressing wave refraction).

Permitting Timeline

March 2021	Conceptual design approved and engineered by EC Atlantic.
June 2021	Permit applications submitted to: NS Department of Natural Resources and Renewables (NSDNRR), Department of Fisheries and Oceans (DFO) and Transport Canada. <ul style="list-style-type: none">• Permits from each governing body required as elements of the design were located below the ordinary high-water mark (OHWM).
November 2021	Navigation Protection Program (Transport Canada) permit approved.
February 2022	Hole in bank attributed to Bank Swallow (Species at-risk) discovered, NSDNRR Crown Lands permit rejected. <ul style="list-style-type: none">• NSDNRR file closed with resubmission required.• DFO file remained open pending resubmission to NSDNRR.
July 2022	After altering the design to maintain the Bank Swallow habitat while providing adequate erosion protection, the DFO file was updated and a new permit was submitted to NSDNRR. <ul style="list-style-type: none">• Updated design maintained the extension of the rock armouring into a submerged wave break.• Replaced graded bank with a cobble berm (matching the existing cobble berms on the site) at the base of the slope, with a small footprint below the OHWM.• Cobble berm will reduce erosion at the base of the bank and allow eroding material to gather and stabilize, rather than be lost.
November 2022	DFO Fish and Fish Habitat Protection Program permit approved. <ul style="list-style-type: none">• Letter of advice from DFO provided to NSDNRR.
November 2022	Permit application to NSDNRR rejected. <ul style="list-style-type: none">• Submerged wave break defined as “infilling”.• Infilling not permitted on submerged Crown Lands.• Recommended and provided a permit for the placement of shoreline armour stone.
January 2023	NSDNRR agreed to review a new application as a nature-based pilot project, including all previously submitted documentation and a proposed monitoring plan.
March 2023	Landowner received letter of consideration for Crown land lease and the associated steps from NSDNRR. (See section <i>Pilot Project</i> for details).

The landowner is left with the following options – allow the property to erode and become worthless, sell the property, continue a lengthy and costly process for a possibility to implement nature-based solutions, or construct further hard armouring to attempt to protect from future erosion.

Barriers

Navigating the permitting process for this NbS has shown to be difficult. CBWES has faced the following barriers to the proposed project:

1. NbS are currently less accessible than hard armouring, as indicated by the substantially reduced permitting required for rock wall construction, and more notably, the directive from NSDNRR to implement hard armouring in place of proposed NbS.
2. A lack of appropriate permit pathways/options for nature-based shoreline solutions in Nova Scotia – although a Use of Crown Lands permit was required, the application focused on docks, wharves and moorings with ‘Other’ being the only applicable choice for this project.
3. Significant differences in policy interpretation and recommendations between governing bodies, as demonstrated by the discrepancy in what is defined as “infilling” between DFO and NSDNRR.
4. No opportunity to amend the NSDNRR permit based on application review findings resulting in prohibitive permitting wait time.

Pilot Project

In January 2023, NSDNRR agreed to review the proposed wave break and cobble nourishment as a nature-based pilot project. This required a new application including all documentation previously submitted as well as a proposal for a monitoring plan, to document the effects of the project on the site and the effectiveness of nature-based solutions for erosion management.

In March 2023, the landowner received a letter indicating that NSDNRR may consider a Crown Land lease for the pilot project. This was the first mention from the Department of the requirement for a Crown Land lease and the associated procedures. The procedure for Crown Land lease includes potential for additional incurred costs associated with archaeological assessment, annual rent and legal survey requirements, and any other steps included under the [NSDNRR Crown Land Leasing Policy](#). Considering legal survey, Aboriginal Consultation process, approval for issuance of Letter of Offer, further Minister or Cabinet approval and subsequent issuance of a Crown Land lease, the process introduces yet another indeterminate delay to the already extended process for the landowner.

Conclusion

As interest in NbS projects has increased in Nova Scotia, it is becoming apparent that there are significant barriers to implementation within the existing system, including lack of adequate permitting pathways and a lack of understanding about the intent of NbS when compared to hard armouring. The current interpretation of policy relating to infill prevents NbS with elements below the OHWM, limiting the application of NbS to only the most sheltered shorelines. This leaves few options for the majority of coastal property owners who recognize the detrimental effects of hard armouring. Under the current system it is faster and easier to construct a hard armour solution.

In the recent NS Climate Change Adaptation Plan, the Province recognizes the need for natural flood protection and ecosystem-based responses to climate impacts. Without adjustments to recognize the intent of NbS in the permitting process, there will be little opportunity to support individuals, businesses, and municipalities in working to increase shoreline health and resilience in the face of climate change.

FOR MORE INFORMATION:

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