



Transportation and Infrastructure Renewal

INFO SHEET

Maintaining the Avon River Aboiteau as Part of Highway 101 Twinning – Three Mile Plains to Falmouth

The proposed project involves the construction, operation, and maintenance of 9.5 km of two-lane controlled-access highway to twin the existing Highway 101 and upgrade an existing tidal gate structure (aboiteau) at the Avon River causeway in partnership with NS Agriculture (NSDA). Maintaining the existing configuration remains the most cost-effective and technically-feasible approach to meet the combined goals of today as well as the original community and government decision in the 1960s: improved efficiency and safety of transportation systems (road and rail), and long-term flood protection for communities, infrastructure, and agricultural land.

The original project re-developed historical dyke systems created over hundreds of years by the partnership of local farmers, business owners, and the provincial and federal governments (see drawing on next page). Instead of 26 km of dykes and 60 aboiteaux that formerly protected the agricultural marshlands, the joint highway-aboiteau system, 700 m-long, protects 2,100 ha of land from tidal flooding. Lands vulnerable to tidal flooding, shown in light blue on the accompanying drawing, are legally protected under the *NS Agricultural Marshlands Conservation Act* and obligate the Government and landowners within the protected lands to maintain the protective dyke system for the collective good of all Nova Scotians. The proposed project with an updated aboiteau and causeway sustains protected land in face of anticipated sea-level rise and climate change (during the projected lifespan of the renewed infrastructure) and will enhance fish passage that is legally required under Section 20 of the federal *Fisheries Act*. Because of these legal requirements, the proponents did not further consider alternative means of crossing the Avon River (e.g., bridge, tunnel, highway bypass of Windsor) that would necessitate the removal of the causeway and construction of an entirely new/re-built dyke system. It is important to note that these alternatives also have higher costs, potentially reduce system resilience to sea-level rise and climate change, and lead to unknown impacts on adjacent salt marshes (designated Ramsar wetland and Important Bird Area).

Climate Change Considerations

Predicted increases in sea-level rise, storm surge and precipitation during the lifespan of upgraded infrastructure were considered in the decision to maintain the aboiteau-causeway system. Updated infrastructure design will meet the climate change predictions of the Fifth Assessment Report (AR5) of the Intergovernmental Panel on Climate Change (IPCC) and minimum 100-year storm predictions (e.g., 100-year rainfall and 100-year storm surge impacts on water levels recently calculated by Réal Daigle). The system will also be resilient in face of higher than expected sea-level predictions and emergency spilling of storm runoff from NS Power dams in the upper Avon River watershed.

Fish Passage Considerations

The Environmental Assessment (EA) prepared by Stantec Consulting Ltd., notes the occurrence of 25 fish species, 21 of which utilize both freshwater and marine/estuarine habitat. Six of the 21 are listed as Species of Conservation Concern (SOC1): alewife (gaspereau), American eel, Atlantic salmon, Atlantic sturgeon, brook trout, and striped bass, but only three are given the highest ratings, endangered, threatened, imperiled (S1/S2; salmon, striped bass and sturgeon). Eel are secure, common, widespread and abundant (S5) and trout and alewife are uncommon, sensitive, with some cause for long-term declines (S4).

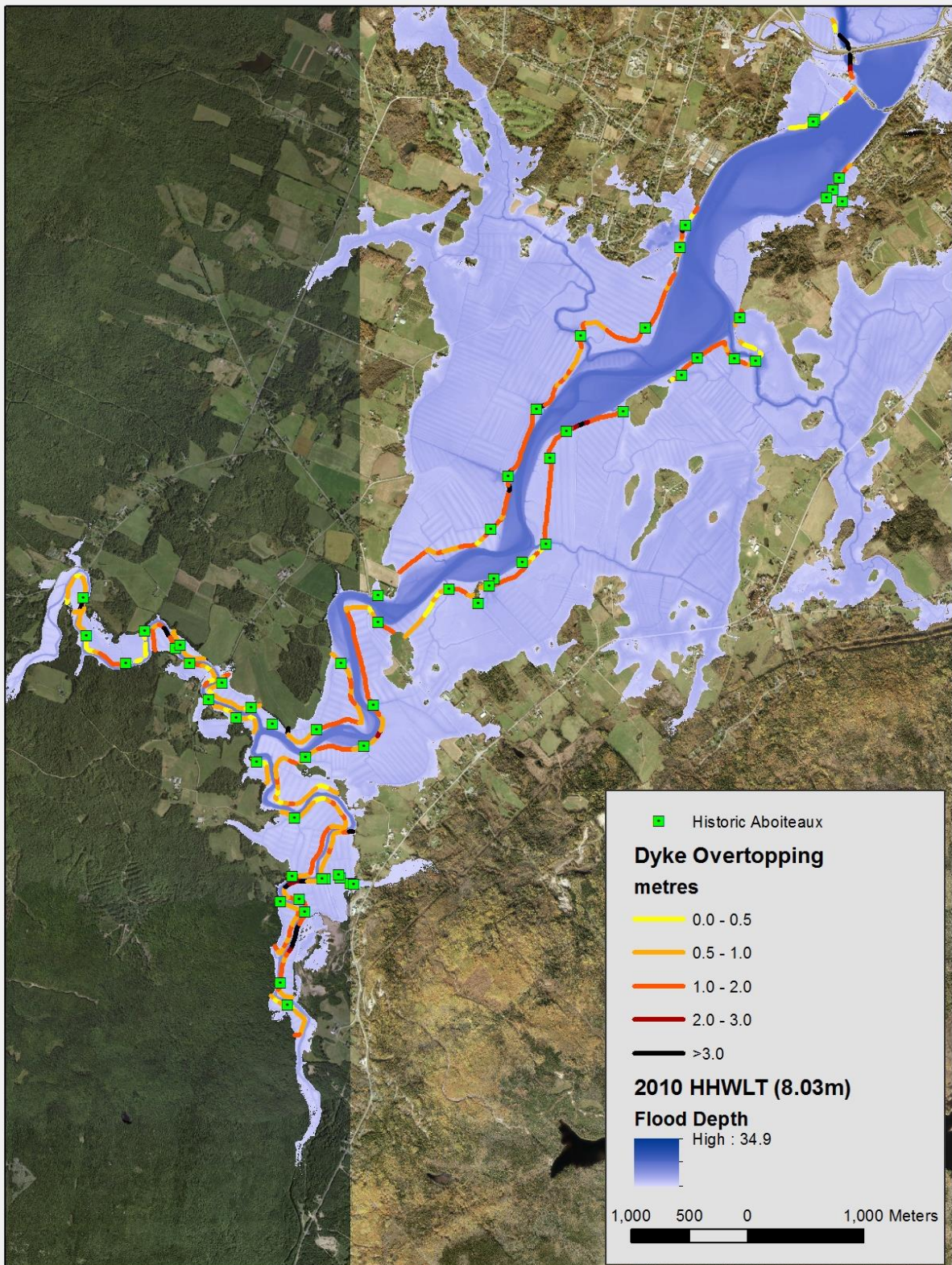
While the original system had definite limitations on fish passage, NSDA successfully adapted the tidal gate system to better accommodate spring movements of gaspereau. NSTIR and NSDA are putting out a request for proposals to experienced consulting firms to derive an innovative solution for improved fish passage for all species in consultation with Fisheries and Oceans Canada (DFO) staff. Given limited baseline knowledge about commercial, recreational and aboriginal fisheries, NSTIR/NSDA have also engaged a unique team of local fishers, academia, and Mi'kmaq to better document fish passage through the current aboiteau, catalog the local, historical and traditional knowledge of CRA fishers, quantify the abundance and timing of species migrations in and near the causeway, and contrast the results of both fisheries-independent (government/academic) and commercial fisheries surveys. Field work began in April and will continue to at least Winter 2019. This new information will help inform detailed design of an upgraded aboiteau. Post-construction monitoring will be conducted to verify improved fish passage and facilitate adaptive management.

NSTIR Communications

Brian Taylor
Tel: 902-424-1750
brian.taylor@novascotia.ca

NSDA Communications

Nicole Hersey
Tel: 902-424-0308
nicole.hersey@novascotia.ca



Lands vulnerable to tidal flooding (without any dyke system; light blue) and the historical dyke system that protected agricultural marshlands prior to the 1968-1970 construction of the Avon River causeway and aboiteau. Different coloured dyke sections reflect the depth of floodwater above the current remains of historic dykes (i.e., quantities of soil required to top old dykes to meet present-day tides; does not account for storm surge; future sea-level rise and storm surge mandate further enhancement).