

Hillman Marsh Conservation Area Restoration Plan Project Charter

Background

Great Lakes coastal wetlands provide indispensable benefits to the freshwater ecosystem, people, and the economy. Coastal wetlands absorb and cycle nutrients, sediments, and pollutants, subsequently improving water quality, erosion control, and carbon sequestration. They provide crucial habitat for a wide range of species, some of which are endangered or threatened. Approximately 90% of pre-settlement coastal wetlands have been lost, and the remaining face a systemic threat, due to land-based activities such as shoreline development, urbanization, and agriculture. In response to record high water levels, barrier beach-ridges experience accelerated erosion, overwash, and breaching leading to the removal or burial of vegetation, and damage to infrastructure and vulnerable habitat. Barrier-protected and diked coastal wetlands are most affected as shoreline hardening structures disrupt longshore drift, cut off sediment supply, and disrupt normal processes of wind and wave movement.

A recent study by Environment and Climate Change Canada (2020) classified coastal wetlands in the Essex County region as “highly vulnerable” to climate change. Climate model results show wetter (7 to 15% increase in annual precipitation) and warmer (2.4 to 5.0°C increase in annual mean temperature) future conditions in the Great Lakes area. Ensemble results from a hydrological model show projected decrease in snowpack (29 to 58%), and increase in evapotranspiration, especially during summer months (up to 0.4 mm/day). These projected climate change trends pose a significant threat to coastal wetland structure, function, and productivity as they can lead to increased runoff, flooding, shoreline erosion, loss of biodiversity, and an increase in invasive species. It is crucial that all remaining coastal wetlands are protected, restored, and made more resilient to current and future threats and stressors.

Hillman Marsh has been under ecological threat since the early 1970's, when approximately 80% of the natural vegetation and habitat was lost due to high lake levels and storms. A small portion of the marsh natural habitat was protected and restored through the construction of diked wetland cells. In 2017, rising water levels and extreme storm events started expanding what was once a small artificial breach opened to lower water levels in the marsh. Consistently since 2017, significant erosion has taken place, and most of the vegetation has been lost. The breach continued to widen, and has since rapidly expanded to almost 500 metres, leaving the marsh, and land adjacent, exposed to the forces of Lake Erie and highly vulnerable to current and future climate change impacts. Current shoreline development both up and downdrift of the barrier beach are starving it of the sediment it needs to naturally recover from breaching events. Over time, what is left of the barrier is continuing to retreat and more of the marsh is lost.

This project highlights a need for the restoration and climate adaptation of the Hillman Marsh ecosystem, as well as the need for the Essex Region Conservation Authority to address its core mandate related to managing the risk of natural hazards. The project builds on the results of

Environment and Climate Change Canada's wetland vulnerability assessment and report "Adapting to Climate Change: Solutions to Enhance Great Lakes Coastal Wetland Resilience" (see appendix for a list of references). This project also addresses commitments in accordance with the Habitat and Species Annexes of the Great Lakes Water Quality Agreement and the Canada-Ontario Agreement on Water Quality and Ecosystem Health and contributes to restoring and enhancing the resilience of species, freshwater aquatic habitat, and essential ecosystem services.

Project Site

This project focuses on the Hillman Marsh Conservation Area and Hillman Beach, an eastern facing barrier beach located on the Point Pelee Foreland. Point Pelee is a ~50 km² foreland that separates the Western and Central Basins of Lake Erie. Sediment is supplied towards the eastern side of foreland through the erosion of glacial bluffs and alongshore drift from the Port Alma to Southeast Shoal littoral cell, however, the construction of the Wheatley Harbour and jetty have trapped or removed over 525,000 m³ of sediment. The barrier beach is exposed to a high wave energy environment as a result of a fetch distance of up to 300 km, resulting in a retreating shoreline (long term average regression rate of -1.06 m/y). Hillman Marsh Conservation Area is a part of the Lake Erie Watershed and falls under the jurisdiction of the Essex Region Conservation Authority.

Project Goal

The goal of this project is to restore and enhance the resilience of the Hillman Marsh barrier beach, and the wetland plant community it protects.

Project Objectives

This project will engage various rights holders and stakeholders in the co-development of a restoration and climate adaptation strategy for the Hillman Marsh Conservation Area. This plan will propose recommended actions to reduce climate change risks and enhance coastal wetland resilience for long-term health, function, and the provision of wetland goods and services. The Plan aims to address the need to conserve and manage lands owned by the Essex Region Conservation Authority that are subject to flooding, erosion, and associated hazards, while simultaneously protecting people and property. When implemented, this will result in the restoration, enhancement, and resilience of the barrier-beach, along with the diversity and extent of the native wetland plant community.

Key Activities

This Restoration Plan will be developed with rights holders at Caldwell First Nation, and with representatives of the following institutions that will be able to provide feedback and share their perspective:

- Ducks Unlimited
- Environment and Climate Change Canada

- Fisheries and Oceans Canada
- Leamington Shoreline Association
- Ministry of Natural Resources and Forestry
- Ministry of the Environment, Conservation and Parks
- Municipality of Leamington
- Parks Canada, Point Pelee National Park
- SJL Engineering
- University of Windsor
- University of Waterloo
- Zuzek Inc.

The Essex Region Conservation Authority (ERCA) is receiving financial support from Environment and Climate Change Canada (ECCC) to coordinate the above committees and providing research and support for the project. Climate data used in this project is gathered from the ECCC 2022 report “Adapting to Climate Change: Solutions to enhance Great Lakes coastal wetland resilience”.

Project Outputs

The main outputs of the Restoration Plan are to:

- Gather and assess historical and current information on Hillman Marsh, including shoreline development, barrier breaching, vegetation, water quality, and wildlife;
- Gather reports of previous barrier or wetland plant community adaptation/restoration projects in the Great Lakes and note successes and failures;
- Develop an outreach strategy to involve appropriate stakeholders and the local community;
- Create a consensus-based restoration and adaptation strategy with recommended actions, timelines, and costs.

Project Outcomes

As a result of the collaborative efforts with the project rights holders and stakeholders, it is expected that this project will:

- Improve understanding of the factors responsible for the degradation of barrier-protected coastal wetlands and the limiting factors for restoration;
- Improve understanding of the controllable levers to mitigate, minimize, and reverse degradation;
- Improve public awareness of the climatic and non-climatic threats on the Great Lakes, and engage and empower public investment in Hillman Marsh;
- Create the first example of barrier beach restoration in Canada and a template to follow for other degraded barrier beaches;

- Create community co-benefits in which restoring the barrier will protect properties and farm inland from flooding;
- Restore and enhance the resilience of the barrier beach to future high-water levels and storm events;
- Restore habitats and ecosystems previously lost in the marsh.