Natural Capital Inventory Ontario Wetland Evaluation System Screening

THE DISTRICT MUNICIPALITY OF MUSKOKA

This project is part of the extended **Integrated Watershed Management (IWM)** initiative, focusing on reducing flooding impacts and enhancing Muskoka River Watershed (MRW) health. It's one of seven chosen for expansion from the original twelve projects. This initiative supports and advances the implementation for an IWM approach for the entire MRW.

You can find more information on the Phase One Report – "Natural Capital Inventory" and the accompanying Summary Factsheet on the District of Muskoka Website at: www.muskoka.on.ca/iwmprojects

Background

The Ontario Wetland Evaluation System (OWES) was developed by Ontario's Ministry of Natural Resources and Forestry (MNRF) to identify significant wetlands in Ontario. It integrates scientific criteria with user-friendly methods tailored for local planning, assessing wetlands based on ecological importance, societal benefits, and rare species protection across four components—Biological, Social, Hydrological, and Special Features. Wetlands scoring above 600 points or 200 points in specific components are deemed "Significant".

At Issue

The recent amendments to the OWES via Bill 23 have raised concerns about the system's effectiveness in accurately assessing the significance of wetlands. Changes such as the removal of points for endangered species and shifts in assessment responsibilities to Municipal Governments and private entities pose potential challenges in identifying provincially significant wetlands to ensure their proper consideration in land use planning.

Scope

This project aims to develop a framework utilizing remotely sensed data to predict OWES scores for wetland features. Key components of the project include:

- ✓ Establish baseline scores and identify potentially significant wetlands within a watershed.
- ✓ Summarize OWES criteria, identify relevant data sources, and propose a scoring system based on available data layers, including high-resolution remote sensing data provided by aerial imagery and LiDAR (Light Detection and Ranging).
- ✓ Validate against existing OWES evaluations to assist in pre-screening wetland significance using readily available datasets, supporting informed decision-making in land use planning.

Methodology

Criteria Compilation and Methodology Documentation

- Extracted OWES Northern Ontario Manual criteria, compiling details in an Excel spreadsheet outlining components, sections, scoring ranges, and criteria attributes.
- Created complementary methodology tear sheets documenting watershed-scale data layers, OWES approach modifications, and data processing steps.
- *(Appendix A and B in the detailed technical report)*

Prioritization of Criteria and Prediction Application

- Prioritized OWES criteria considering data availability, geoprocessing complexity, and criteria weight, resulting in predictions applied to 37 of the 51 criteria.
- *(Appendix A and B in the detailed technical report)*

Evaluation and Comparison

- Evaluated prediction efficacy by comparing results against four existing wetland evaluations (Childs Pit Quarry, Bala Wetland Complex, Mactier Wetland Complex, Tandenac North Wetland Complex) with varying status outcomes and evaluation dates spanning from 2004 to 2022.

Scoring and Analysis

- Utilized the most recent OWES iteration (2022) for scoring, excluding Endangered or Threatened species and altering wetland complex evaluation methods.
- Compiled predicted scores for each wetland unit.
- Conducted analyses comparing component and criteria scores, determining status based on predicted scores alone and combined approaches with existing OWES scores.
- *(Appendix C in the detailed technical report)*



Results

Criteria Comparison

Variation in Predicted Scores

Predicted scores across OWES component categories differed; Biological scores tended to be lower, Social scores were mixed, Hydrological scores tended to be higher, and Special Features varied widely.

Extreme Mismatches in Specific Criteria

Nine criteria consistently showed significant differences between predicted and formal OWES scores, some consistently underpredicted or overpredicted by more than 10 points.

Status Determination

Accuracy of Status Prediction

Despite score differences, predicted OWES scores correctly anticipated the status of all four evaluated wetland systems, particularly aligning with the Special Features component.

Impact of Formal OWES Scores

By including formal OWES scores for specific criteria within the Biological and Hydrological components (not part of the prediction process) the accuracy of predicting the wetlands' status significantly improved.



Evaluation of Predicted Scores

- Predicted scores for Special Features criteria serve as a primary indicator for determining the likelihood of a wetland being provincially significant. Estimating these scores involved data layers from NHIC, GBIF, and Significant Wildlife Habitat mapping.
- Estimating accurate scores for Biological, Social, and Hydrological components faces limitations:
- Biological Component: Underestimation due to lower-resolution land cover mapping affected scores, particularly for vegetation diversity criteria in larger wetland complexes.
- Social Component: Difficulty estimating criteria at the watershed scale due to the requirement for site-specific socio-economic data.
- Hydrological Component: Exclusion of high-scoring criteria due to challenges in obtaining localized information like flood attenuation and adjacent watershed land-use data.

Recommendations for Component Enhancements

- Suggested a manual desktop approach for assessing criteria like Open Water Type due to complexities in automating watershed-scale methods.
- Proposed consultation with First Nations to incorporate their perspectives into documenting wetland importance at a watershed scale.
- Recommended a manual assessment of groundwater discharge criteria using a desktop approach based on wetland catchment area and associated characteristics.
- Suggestions included developing a local species status list, detailed desktop analysis for criteria like Fish Habitat, and assessing Great Lakes Coastal Wetlands where applicable.

Framework Application and Next Steps

- The prediction framework serves as a preliminary tool for the District of Muskoka to pre-screen wetland features for potential significance.
- Application in unassessed properties aids in anticipating wetland significance, guiding development decisions, and scoping field programs.
- Advise expanding the framework's application across the broader MRW, validating predicted scores against other OWES evaluations, and refining scores for criteria not included in the prediction framework.

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For the complete report and further information on Integrated Watershed Management (IWM), the twelve projects (including the seven extended ones), and efforts towards an Integrated Watershed Management approach for the Muskoka River Watershed, please visit www.muskoka.on.ca/iwmprojects.

This project has received funding support from the Government of Ontario.
Such support does not indicate endorsement by the Government of Ontario of the contents of this material.