

**TO:** Chair and Members of the Executive Committee  
Meeting #4/05, June 3, 2005

**FROM:** Nick Saccone, Director, Restoration Services

**RE: WATERSHED IMPACT MODELLING TOOL**

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**KEY ISSUE**

Memorandum of Understanding with the Ministry of Natural Resources to support the development of a watershed impact modeling tool.

**RECOMMENDATION**

**THAT staff be directed to sign a Memorandum of Understanding with the Ministry of Natural Resources for the creation of a scenario testing (modeling) tool to evaluate the watershed impacts associated with development on aquatic habitats;**

**AND FURTHER THAT funding in the amount of \$20,000, including applicable taxes, be made available to support the development costs.**

**BACKGROUND**

The Ontario Ministry of Natural Resources (MNR) has been leading a coalition of partners from along the north shore of Lake Ontario, that includes Fisheries and Oceans Canada, Environment Canada, the City of Toronto and conservation authorities (Toronto and Region Conservation Authority (TRCA), Central Lake Ontario Conservation Authority (CLOCA), Ganaraska Region Conservation Authority and Conservation Halton), to assist in the development of a set of models to aid in characterizing streams and fish and benthic communities in southern Ontario, and to assess changes in the aquatic community following land-use change. TRCA has been active in this coalition through the provision of monitoring data and technical support, and through the administration of the funding and work contracts related to the project.

One of the initial products from this work will be the development of a tool to enable users to test the effects of disturbance on the landscape to instream conditions. Recently, analysis has been conducted on Lake Ontario data sets to develop models to relate landscape conditions with a variety of metrics that describe stream conditions. Input landscape variables included two composite measures, one for geology and the other for land cover/use (i.e. percent impervious cover), in addition to catchment area, elevation, access to Lake Ontario and site slope. This tool will enable the user to predict whether the stream conditions are likely to be affected or not by alterations in the amount and type of land cover within the catchment.

This tool will be developed as an add-on to the Water Resources Information Project (WRIP) toolbox, taking advantage of the existing applications for defining catchments and measuring attributes of sites. It will be designed to enable scenario testing on individual sites within a catchment. Users will be able to estimate stream conditions on existing land cover layers. Users will then be able to modify the land cover layer and recalculate the impervious cover values under the new scenario and re-run the models to see whether these changes would be predicted to have an effect.

### **RATIONALE**

The development of the modeling tool, as an added feature of the WRIP toolbox, requires additional analysis and processing of provincial data sets, along with development work related to the Geographic Information Systems (GIS) based program. This work needs to be carried out by the MNR's Spatial Analysis Unit in Peterborough.

A technical committee including representation from TRCA, CLOCA and MNR will guide the development of the application tool, evaluate its performance and participate in technology transfer sessions to other Lake Ontario Modelling Coalition conservation authority partners.

### **FINANCIAL DETAILS**

Funding for the project has been committed by the Ministry of Natural Resources (research - \$35,000), Environment Canada (\$25,000) and TRCA (\$35,000) through capital funding provided by York, Peel and Toronto. Funding for the project is available in accounts 120-55 (Evaluating the Conditions of Aquatic Communities) and 120-50 (Development of Predictive Models of Land-Use Impacts).

**Report prepared by: Scott Jarvie, extension 5312**  
**For Information contact: Scott Jarvie, extension 5312**  
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