Items for the Information of the Regional Watershed Alliance

TO: Chair and Members of the Regional Watershed Alliance
Meeting #4/19, Tuesday, November 12, 2019

FROM: Laurie Nelson, Director, Policy Planning

RE: **VALUATION OF ECOSYSTEM SERVICES PROVIDED BY THE CITY OF TORONTO RAVINE SYSTEM**

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KEY ISSUE

To inform the Regional Watershed Alliance regarding the results of an ecosystem service valuation of the Toronto ravine system and discuss potential application and advancement of this approach in other parts of TRCA's jurisdiction as appropriate.

RECOMMENDATION

WHEREAS the Toronto Ravine Strategy, approved in 2017 by Toronto City Council, outlines several actions for supporting a natural, connected, and accessible ravine system for the health and well-being of the city;

AND WHEREAS completing an analysis of the ecosystem services provided by Toronto's ravine system is one such action specified in the Ravine Strategy;

AND WHEREAS the Toronto and Region Conservation Authority (TRCA), in support of the implementation of this strategy, partnered with the City of Toronto to undertake an ecosystem service valuation study in 2018;

THEREFORE, LET IT BE RESOLVED THAT the Regional Watershed Alliance receive the staff report on the ecosystem service valuation study;

AND FURTHER THAT staff continue to engage the Regional Watershed Alliance in the current science and application of ecosystem service valuation approaches, as well as engagement opportunities, in order to advance TRCA programs and support municipal partners.

BACKGROUND

In 2017 the City of Toronto developed its first Ravine Strategy. The Strategy recognizes the critical role ravines play in the health and well-being of the city, as well as the continued pressures that population growth, new development, and climate change place on the ravine system. The vision of the Strategy is:

> *A ravine system that is a natural, connected sanctuary essential for the health and well-being of the city, where use and enjoyment support protection, education and stewardship.*

The Strategy outlines five guiding principles and twenty actions for Toronto's ravines, as developed through extensive consultation with the public, interest groups, staff and key stakeholders. One such action is to undertake an analysis of the ecosystem services provided by the ravine system. Specifically, the Strategy directs focus to the *market* and *non-market value* of ecosystem services, such as air pollution removal, erosion control, and recreation.

The intended goal of this action is to raise awareness about the essential role that the ravine system plays in the health and wellbeing of human and non-human residents. Although the application of economic models to complex ecological systems is understood by staff to be a challenging and contentious undertaking, such studies can provide useful information to support consensus-building and outreach efforts.

In 2018, the City of Toronto and the Toronto and Region Conservation Authority partnered to undertake the ecosystem service analysis as outlined in the Ravine Strategy. Green Analytics, a consulting firm specializing in the valuation of ecosystem services, was retained to undertake the technical assessment. The study was completed in the summer of 2018 (Attachment 1).

RATIONALE
Toronto's ravine system provides many benefits to the people of Canada's most populated city, including improved air quality from the filtering effects of trees, recreation and active transportation opportunities, aesthetic benefits from natural landscapes, and cultural and spiritual benefits. These benefits are termed *ecosystem services*. By framing these benefits in this manner, staff are better able to conceptualize, plan and manage natural systems as essential *green infrastructure* requiring dedicated investment.

In order to more fully understand the value of the ravine system, Green Analytics completed an economic evaluation that considered thirteen distinct ecosystem services (Attachment 2, Table 1). A monetized value was estimated for eight of the thirteen services. The remaining services identified were not evaluated for several reasons, including a lack of necessary data and unsuitability of existing economic methods.

Several different techniques are available for assigning monetary values to ecosystem services. The two main approaches used for this study are:
   a) An expenditure approach, which calculates money spent to access the ecosystem services provided by the ravines;
   b) An avoided costs approach, which calculates the reduced economic costs (to health-care for example) as a result of the services provided by the ravines.

The study utilized locally derived data to the greatest extent possible. However, where local data was not available, values derived in other communities were used. Table 2 (Attachment 2) outlines the ecosystem services quantified in the study and the metric applied to the calculation of associated benefits.

Based on the monetized benefits, the total annual value of the ecosystem services provided by Toronto's ravines is an estimated $822 million. Table 3 (Attachment 1) outlines the physical and monetary flow accounts for the ecosystem services assessed.

Study Limitations
There are several limitations that must be considered when applying and communicating the results of ecosystem service valuation studies. Such assessments tend to include only a subset of the ecosystem services generated by a target land area. For example, the Toronto ravine study did not assess several important services, including flood mitigation. In many instances, the monitoring data required to assign value may be incomplete or absent altogether. The complexity and interconnectedness of ecosystems presents significant challenges for economic models that rely on discrete, monetizable parts. Furthermore, the value derived from a landscape may be highly subjective and strongly influenced by the unique worldview and lived-

experience of an individual. Thus, it is difficult to aggregate all the nuanced preferences of individuals together to reflect larger group values. It follows that the values presented in this study should be considered conservative estimates and care should be taken to communicate and apply the values appropriately.

Relationship to Building the Living City, the TRCA 2013-2022 Strategic Plan
This report supports the following strategies set forth in the TRCA 2013-2022 Strategic Plan:
Strategy 3 – Rethink greenspace to maximize its value
Strategy 4 – Create complete communities that integrate nature and the built environment
Strategy 9 – Measure performance

FINANCIAL DETAILS
The funds required for this project were provided by the City of Toronto.

DETAILS OF WORK TO BE DONE
Staff will seek RWA input on potential application of this approach to increase public awareness.

TRCA will continue to support our municipal partners in the advancement of the science and application of ecosystem service valuations. We will work the City of Toronto to utilize these study results for public communications and other purposes, as requested.

Finally, staff will continue to monitor and engage with researchers and practitioners engaged in the discipline of ecological economics in order to apply existing and emerging methods for valuation accurately and responsibly.

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Attachments: 2

Attachment 1: Ecosystem Service Values of the City of Toronto Ravine System
Attachment 2: Supporting Tables for City of Toronto Ravine Ecosystem Services