Protected Areas and Watershed Management

Rob Messervey
Ontario Ministry of Natural Resources

Introduction

The linkages and relationship between watershed management and the protection of natural areas are robust and clear. This commentary paper identifies some specific initiatives or programs in which the Ontario Ministry of Natural Resources (OMNR) has been directly involved as demonstration of the critical interplay between protected areas management and watershed management activities. These linkages are well demonstrated by the following recent or current initiatives: 1) Ontario's Living Legacy; 2) Watershed-based Source Protection Planning; 3) Oak Ridges Moraine Conservation Plan; and, 4) Watershed-based Pilot Projects.

Ontario's Living Legacy

Premier Harris announced *Ontario's Living Legacy* in March 1999, marking the largest expansion of parks and protected areas in provincial history. This program has enlarged Ontario's protected areas system by 2.4 million ha, constituting 12% of the planning area, by adding 378 new parks and protected areas. Once all of these areas are formally regulated under the *Provincial Parks Act* and the *Public Lands Act*, this will bring the total in Ontario to 650 with a total area of 9.5 million ha. This is an area equivalent to almost all of southern Ontario south of Algonquin Park.

Included are nine signature sites such as the Great Lakes Heritage Coast, Kawartha Highlands and Nipigon Basin. Signature sites are areas with exceptional natural heritage features that warrant special protection and promotion.

To effectively manage a system of protected areas, priorities have been set for identifying natural features and ecosystems. Protection of watershed-based resources will be a key component of a co-operative, partnership-driven Crown land-use planning process. Planning and management of the parks and protected areas system will also be achieved through the parks management planning process in which plans are developed for each park within the system. This system also extends to waterway parks.

The target for waterway class parks is to establish one waterway park, or an equivalent waterway corridor, traversing each of Ontario's 65 site districts. This provides an additional 911,000 ha of watershed-based protected area to the parks system. At this time, 37 of the 65 waterway class park targets have been achieved.

Watershed-based Source Protection Planning

In his *Part 2 Report* of the *Walkerton Inquiry*, Justice Dennis O'Connor made very clear that a provincial legislated framework for watershed-based source protection planning is required to put in place measures that will help ensure the safety of Ontario's drinking water and protect public health.

While the focus of the *Part 2 Report* was on drinking water protection, it was recognized that source protection needed to be integrated with the planning and management of other environmental concerns. The protection of drinking water cannot be achieved on the landscape without putting source protection planning in context with overall watershed planning and water management. Source protection plans should be considered as components of watershed plans. As O'Connor indicates, watersheds are an ecologically practical unit for managing water (OMAG, 2002: 94).

To build a framework for watershed-based source protection consistent with O'Connor's 22 recommendations on source protection planning, the Minister of the Environment (MOE) established the *Advisory Committee on Watershed-Based Source Protection Planning* in November, 2002. This Committee has now reported back to government via its report entitled *Protecting Ontario's Drinking Water: Toward A Watershed-based Source Protection Planning Framework* (MOE, 2002).

In its discussion about what source protection planning is really about, the *Advisory Committee* made several statements which make the link between watershed-based planning and the protection of significant areas. For example, *"Watershed-based source protection acknowledges that the quality and quantity of ground and surface water are influenced by the ecological integrity of the watershed. By maintaining, improving or restoring the health, diversity and function of key natural features that perform a hydrologic function (e.g. wetlands, forested lands and riparian corridors), water resources within a watershed can be protected or enhanced. The Advisory Committee agrees with Justice O'Connor that protecting and enhancing natural systems is one of the most effective and efficient means of protecting the safety of our drinking water."* (OMAG, 2002: 2)

Through its deliberations, the *Advisory Committee* outlined the minimum contents of a watershed-based source protection plan. Starting with the preparation of a water budget and a fate of contaminants model, the minimum plan content includes maps that identify areas of high, medium and low vulnerability areas and sensitive water resources. Another key component of the plan is the identification and delineation of natural features (e.g., various types of wetlands, woodlands and riparian zones that contribute to the protection of drinking water sources). The plan must further identify where source protection issues exist, such as areas where the plan might need to influence or govern municipal land use and zoning.

Clearly, the *Advisory Committee*, while focusing on measures that will ensure clean and safe drinking water, is intending to ensure that natural systems and their functions are maintained, improved or restored as a critical element of protecting or enhancing water resources. This may include implementation tools along a continuum that may move from

legislated requirements such as *Planning Act* considerations, through regulatory provisions such as implementation of measures under the *Oak Ridges Moraine Conservation Plan*, to incentive programs such as Healthy Futures (OMAF), to volunteer actions by individuals or communities, such as OMNR's *Ontario Stewardship Program* activities.

To measure progress at the watershed level as a result of watershed-based source protection plan implementation, the *Advisory Committee* has also identified a number of key results-based parameters that will need to be monitored over time. One of these is improving water quality through the protection of existing surface and groundwater from degradation, and the improvement and restoration of water quality where degraded. A second is assessing water quantity to enable us to ensure the availability of an adequate and affordable supply of water. A third is protecting ecosystems and restoring altered systems to a naturally functioning condition.

The linkages between source protection planning, nested within the broader watershed planning model, and the protection of natural areas are definitely demonstrated and supported within the source protection planning framework.

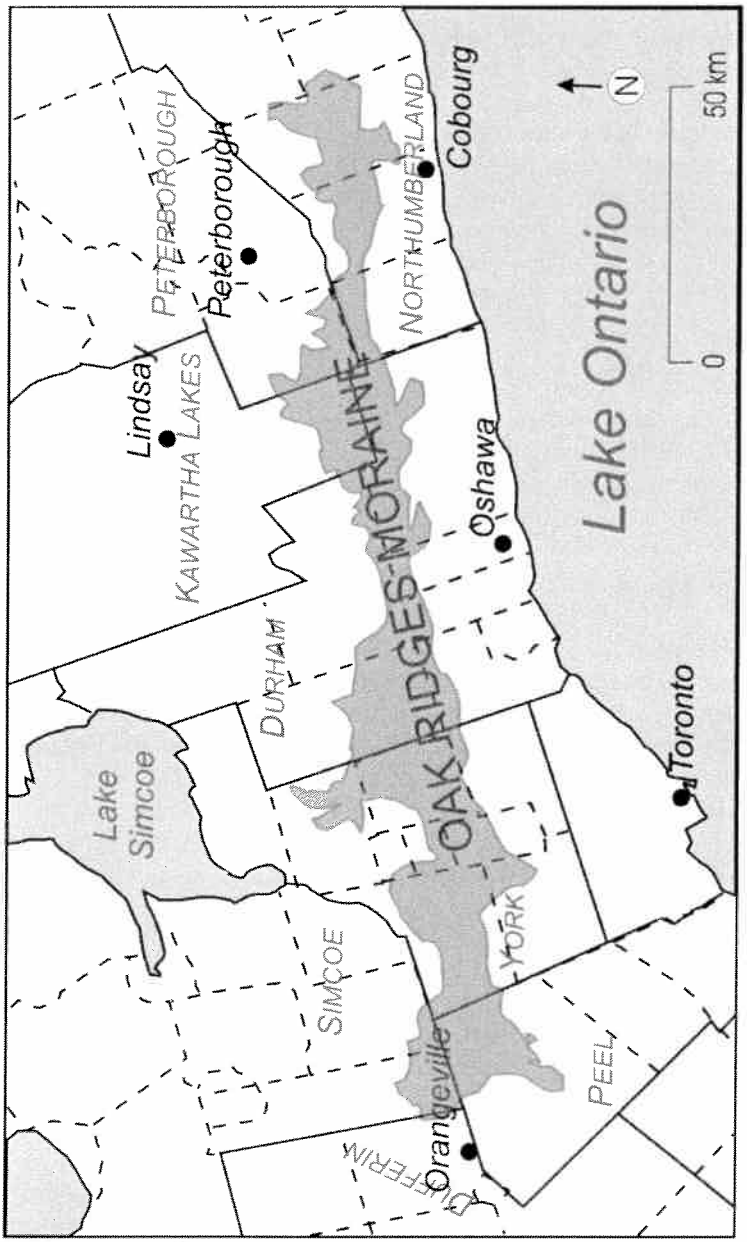
Oak Ridges Moraine Conservation Plan

The *Oak Ridges Moraine Conservation Plan* (OMMAH, 2002) is an ecologically-based planning document that provides land use and resource management direction for the 160 km-long Oak Ridges Moraine (Figure 1) and its 190,000 ha of land and water resources. The Moraine has a unique concentration of environmental, geologic and hydrological features that make its ecosystem vital to south-central Ontario. This plan was completed through the collaborative efforts of a broad range of stakeholders, with the support of provincial ministries, including the OMNR, under the leadership of the Ministry of Municipal Affairs and Housing (OMMAH). The goal was to create a plan that would protect the important water resources and significant natural features - a plan that would set aside and protect sensitive natural areas and systems while allowing controlled development. The plan has been successful in meeting this goal. The plan focuses development in approved settlement areas, prevents sensitive core and linkage areas from ever being diminished, and preserves agricultural land.

To achieve its goal, the plan has established four broad land-use designations (OMMAH, 2002: 6):

1. Natural Core Areas (38%) — large concentrations of key natural features, hydrologically significant areas and significant landforms;
2. Natural Linkage Areas (24%) — rural lands that link natural core areas with each other and with other natural corridors, such as the river valleys north and south of the Moraine;
3. Countryside Areas (30%) — where rural and agricultural activities occur; and,
4. Settlement Areas (8%) — where urban land uses are permitted.

Figure 1. *The Oak Ridges Moraine (OMMAH, 2004).*



To ensure the protection of water resources and natural features, the following provisions are contained in the plan (OMMAH, 2002: 6):

- Watershed planning, water budgets and water conservation efforts must be incorporated into municipal Official Plans;
- Kettle lakes, permanent and intermittent cold-water streams, wetlands, seepage areas and springs are protected from development;

- Storm water management systems causing rapid infiltration of storm water into aquifers is prohibited;
- Impervious surfaces within sub-watersheds outside settlement areas are limited; and,
- Municipalities are required to delineate wellhead protection areas to prohibit certain activities.

In order to protect natural heritage features and values, the plan also provides that (OMMAH, 2002: 6):

- Developmental constraints apply to Areas of Natural and Scientific Interest, wetlands, significant woodlands and valley lands, fish habitat, and signifi cant portions of the habitats of threatened or endangered species, sand bar rens, savannahs, and tallgrass prairies; and,

- Protecting and managing the health, diversity, size and connectivity of key natural heritage features is critical to the ecological and hydrological integrity of the Oak Ridges Moraine.

This plan is a very recent and excellent example of how watershed-based planning that considers the relationship between ecological and hydrologic functions of a planning area can achieve the protection of natural areas and features.

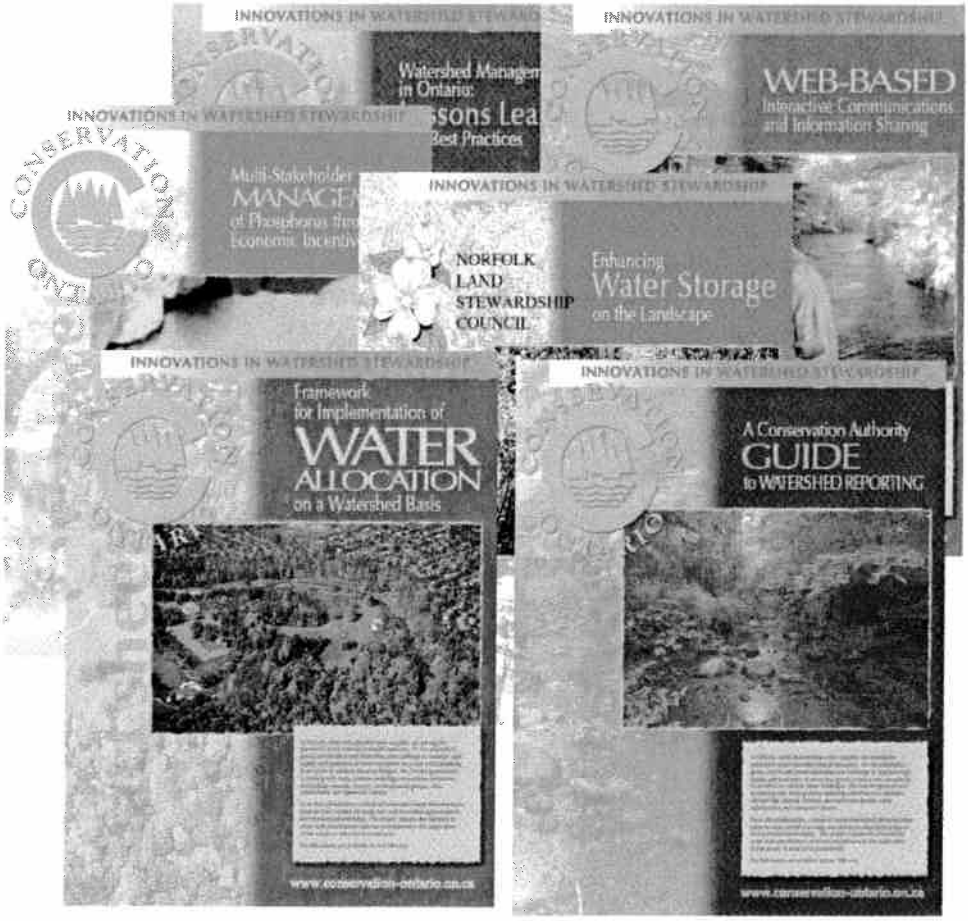
Watershed-based Pilot Projects

The Ontario government is working with many partners, including conservation authorities (CAs), to address the challenge of maintaining high quality and adequate quantities of water as populations grow and development intensifies. Through a collaborative process involving a number of CAs, the OMNR on behalf of the province of Ontario, and the Norfolk Land Stewardship Council, a series of watershed-based demonstration projects have recently been completed using new and innovative approaches to environmental stewardship.

Phase I of these watershed-based demonstration projects has focused on developing standardized tools and approaches for local water managers on a range of watershed-management topics. Several of these pilot projects focus on best management practices or approaches to dealing with the protection of water and water-related resources on the landscape. The pilot projects add to the tools available to watershed managers in the development of a continuum of new legislation, policies, incentive programs and volunteer actions to maintain and restore the health of Ontario's watersheds. This continuum will include land securement/land protection mechanisms.

Several of these pilots examine lessons learned over the past decade about optimal approaches to managing water resources and how best to deliver and transfer information and knowledge on the health of watersheds to the broader public, conservation authorities, municipalities, interest groups and others working to manage watershed resources.

Figure 2. *Watershed-based pilot projects.*



The Phase 1 projects are summarized as follows:

Watershed Reporting: Improving Public Access to Information
Partners: Rideau Valley CA, Upper Thames CA

To address the public's demand for understandable environmental information, and in an effort to standardize the watershed reporting process, con-servation authorities across Ontario provided input into the development of a guide to watershed reporting. The guide includes environmental information required in the watershed reporting process and presents Watershed Report Cards as the best format to deliver easily understood information on the health of watersheds to the broader public.

Web-Based Interactive Communications and Information Sharing
Partners: Lake Simcoe Region CA, Grand River CA

The Lake Simcoe Environmental Strategy (LSEMS) was launched in response to grow-

ing concerns about the health of Lake Simcoe. As part of the management strategy, an interactive web site was developed to encourage greater public awareness and involvement in the LSEMS program. The guide provides step-by-step information on how to develop similar websites for other watersheds.

A Framework for Local Water-Use Decision Making on a Watershed Basis
Partners: Credit Valley CA, Grand River CA, Toronto Region CA

Significant portions of southern Ontario face escalating water demands associated with population growth and economic expansion, and other areas are struggling with low water conditions that may become common place in the future as a result of climate change. To address these challenges, the Water-Allocation and Water-Use Framework attempts to move away from decision making along political boundaries towards a watershed approach in allocating and managing water resources.

Watershed Economic Incentives Through Phosphorus Trading and Water Quality
Partners: South Nation CA, Lake Simcoe CA

Excess phosphorus loading is a problem in many watercourses throughout Ontario. Watershed studies show that the majority of the problem comes from non-point sources of pollution, such as manure run-off and shoreline erosion. "Total Phosphorus Management" is a leading edge initiative which enables municipalities, industry and agriculture to work together to lower phosphorus loadings within their watersheds. Successful implementation of this new approach has been demonstrated by proactive local part nerships in the South Nation River and discussions are underway for the Lake Simcoe watershed.

Lessons Learned and Best Practices in Watershed Planning
Partners: Credit Valley CA, Grand River CA, Toronto Region CA

The Credit Valley Conservation, the Grand River Conservation Authority and the Toronto and Region Conservation Authorities are among the largest CAs with the most experience in watershed management in Ontario. From their experiences and lessons learned over the past ten years, useful and transferable information has been identified. These best management practices may be applied by other CAs, municipalities, interest groups and others working to maintain and restore the health of Ontario's watersheds.

Enhancing Water Storage within a Watershed through Wetland Restoration
Partners: Norfolk Land Stewardship Council, Ministry of Natural Resources (Aylmer), Norfolk County (Public Works and Environment)

An efficient and cost effective solution to safeguard against future low water levels and to improve the quality and quantity of water supplies in agricultural demonstrated in Norfolk County. The Wetland Drain Restoration Project involves the use of municipal drains as tools to restore surrounding wetlands and their associated ability to store and release water later in the growing season. A diverse partnership of agencies, landowners, farm organizations and municipalities has successfully restored numerous wetlands in

Norfolk County using this innovative approach.

A number of Phase 2 projects are about to get underway as well. These pilots are focusing on source protection planning. One project is entitled *Source Protection Planning in Rural Ontario: How Much data is available? How much is Enough?* The partners are the Lower Trent Region CA, Ganaraska Region CA, Crowe Valley CA. The purpose of the project is to determine what types of data are readily available, or can easily be generated to use for source protection mapping and other watershed management initiatives to ensure the appropriate management actions are implemented and progress towards plan objectives can be monitored and assessed. The focus of the project will be on identifying benefits and limitations of using different data sets for source protection mapping applications. Information gaps will be identified and proposed data standards developed for specific information sets required for source protection planning, based on this analysis. Recognizing the variability of data available for different areas, the benefits/costs of using different data sets will be investigated.

Ultimately, all of these tools will be essential best management practices contributing to informed decision-making in support of source protection and watershed-based planning. The securement and management of protected areas will be key to this decision-making process.

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