

Watershed Management Plan

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The Goal of the Watershed Plan is the conservation of natural resources within our watershed in a cooperative, integrated manner in which human needs are met in balance with the need to sustain the natural environment.

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A number of individuals, groups, and agencies have provided a great deal of assistance to the Nottawasaga Valley Conservation Authority in preparing the Watershed Plan.

In the Fall of 1993, a Planning Team was established to assist in the preparation of the Plan. This Planning Team, which had a total of 60 members, government, consultants, was comprised of representatives from upper and lower tier levels of local watershed residents, special government, consultants, watershed residents, special interest groups, non- interest groups, non- governmental organizations, provincial agencies and adjacent conservation authorities. For one year this team met for approximately one day every six to eight weeks to provide N.C.V.A. staff with guidance and advice on watershed issues . The Nottawasaga Valley Conservation Authority offers sincere thanks authorities. to the following Planning Team members for dedicating their time and energy to the Watershed Planning Process:

*Arthur Anderson, Ministry of Municipal Affairs and Housing *Angela Baldwin, Richard Jones
Planning Consultants *Don Bell, N.V.C.A. Executive Committee *John Bell, Watershed
Resident *Ian Bender, County of Simcoe *Doug Carroll, Ministry of Municipal Affairs and
Housing *Sandra Clee-Chilvers, Town of New Tecumseh *Ken Chow, G.M. Sernas and Associates
Ltd. *Ross Cotton, Reid and Associates (1994) Ltd. *Helen Coutts, Farmer/Township of
Springwater *Ross Duncan, Maitland Valley Conservation Authority *Gary Dunn, Watershed
Resident *Mark Early, Township of Mono *Peggy Gale, Ministry of Environment and
Energy *Tiina Gallagher, Watershed Resident *Lynn Gibson, Township of Mono *Henry Glavic,
R.G.Robinson and Associates * Doug Green, Ministry of Agriculture Food and Rural Affairs *Tom

Gorman, N.V.C.A. *Paul Hannan Simcoe County Board of Education *Sue Harrison, Ministry of Municipal Affairs and Housing *Chris Hibberd, N.V.C.A. *Doug Hill, Grey Sauble Conservation Authority *Bill Huff, Canadian Forces Base Borden *Karen Jones, Ministry of Environment and Energy *Maxine Kingston, Ontario Ministry of Agriculture Food and Rural Affairs *Malcom Kirk, Collingwood Senior League *John Lackey, Triton Engineering Services Ltd. *Bob Law, Ministry of Natural Resources *Dianne Lessels, N.V.C.A. Executive Committee *Bill MacKenzie N.V.C.A. Executive Committee *Beverley Mansbridge, N.V.C.A. *Greta McGillvray, Collingwood Senior League *John Moore, Watershed Resident *Leonard Mortson, N.V.C.A. Executive Committee *Fred Nix, N.V.C.A. member
*Harold Parker, Watershed Resident *Mark Peacock N.V.C.A. *Barry Peyton, Reid and Associates (1994) Ltd. *Ross Raymond, Raymond Walton and Hunter Planning Consultants *Sid Ryzebol, N.V. C.A. Member *Douglas Skeates, Ontario Conservation Council *Larry Slomka, Simcoe County District Health Unit *viii NOTTAWASAGA VALLEY WATERSHED MANAGEMENT PLAN *Jerry Smitka, Ministry of Natural Resources, C.A. Section *Constance Spek, N.V.C.A. Provincial Appointee *Joan Sutherland, N.V.C.A. Member *Boris Swidersky, Angus Star *Reinie Vos, Lake Simcoe Region Conservation Authority *Marion Waddington, Watershed Resident *Steve Walker, R.J. Burnside and Associates
*Clifford Weston, Watershed Resident *Peter Wigham, Metro Toronto Region Conservation Authority *Charlie Worte, Credit Valley Conservation *Barbara MacKenzie Wynia, N.V.C.A. *Michael Wynia, Krystawyn Environmental- Skelton Brumwell and Associates
*Ron York, South Simcoe Soil and Crop Improvement Association *Robert Young, Watershed Resident.

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Throughout this planning process, there were a number of individuals who gave presentations to the Planning Team. These presentations, which focused on issues in the watershed, were an invaluable source of information and direction. We thank the following individuals for their presentations:

Douglas Green, Ontario Ministry of Agriculture Food and Rural Affairs *Peggy Gale, Ministry of Environment and Energy *Bob Law, Ministry of Natural Resources *Helen Coutts, Township of Springwater *Fred Dobbs, Black Ash Creek Project *Brian Whitehead, Ministry of Environment and Energy *Lloy Logan, Ministry of Environment and Energy *Gordon Coukell, Environmental Farm Plan *Debbie Ramsay, Niagara Escarpment Commission *Larry Slomka, Simcoe County District Health Unit *Dr. Hani Farghaly, Ministry of Environment and Energy *Jamie Fortune, Manotick Land Owner Resource Centre *Barbara Veale, Grand River Conservation Authority *Dr. Dennis Gregor, Waterloo Centre for Groundwater Research *Paul Martin, Waterloo Centre for Groundwater Research *Doug Carroll, Ministry of Municipal Affairs and Housing *Jill Proud, Environment Network of Collingwood *Michele Rich, Environment Network of Collingwood.

Staff preparing the Watershed Plan have also received support and advice from the Watershed Planning Project Management Committee (PMC). The PMC brought together the watershed and subwatershed pilot projects of the province and provided these groups with an opportunity to share experiences and ideas amongst project leaders, agency staff, and PMC members.

Special thanks go out to Wayne Wilson, Charles Burgess, and Wendy Gleason of the Core Team. This Team collated the background information and stakeholder input and produced this document. The time and effort devoted by this group is reflected in the quality of this document. We also thank Kim Chappell Veronica Evers, Robyn Chappell, and Beverley Rowlands for their assistance in collecting and compiling background information for the Watershed Plan.

We would also like to thank our watershed municipalities and the Ministry of Natural Resources for providing funding for this project. Without your assistance this project would not have been possible.

Last but not least, we thank Gary Page, the graphic designer for the Watershed Plan. Gary's artistic

talent and input has enabled us to produce a document that is easy to read and great to look at.

To these individuals and others that have assisted us in the preparation of the Watershed Plan, we offer sincere thanks. Without your assistance this plan would not be what it is today. We now look forward to working with you in the future to implement this Plan.

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The Goal of the Watershed Plan is the conservation of natural resources within our watershed in a cooperative, integrated manner in which human needs are met in balance with the need to sustain the natural environment.

EXECUTIVE SUMMARY

The intent of the Nottawasaga Valley Watershed Management Plan is to provide direction for resource management in the Nottawasaga Valley Watershed. The Watershed Plan attempts to coordinate existing provincial legislation and policy into a useful background document which: supports and addresses a wide variety of land use issues; identifies key responsibilities of stakeholders; and makes recommendations for the implementation of resource management actions.

Given their broad resource management mandate and areas of jurisdiction, conservation authorities have taken a coordinating role in watershed planning and management. In keeping with this role, the Nottawasaga Valley Conservation Authority has worked in cooperation with watershed municipalities, residents, the development industry, government organizations, non- governmental organizations, special interest groups, and bordering conservation authorities to prepare this Watershed Plan.

The goal of the Watershed Plan is: the conservation of natural resources within our watershed in a cooperative, integrated manner in which human needs are met in balance with the need to sustain the natural environment.

The Watershed Plan is based on principles that reflect:

- A watershed ecosystem approach to planning and management.
- The protection of water systems through wise use.
- Innovative technology.
- Proactive resource management.
- Economic considerations being incorporated into all management sections.
- Landowner rights and privileges
- consultation through open and accessible decision making

- a fair and equitable process
- education
- streamlining to reduce duplication of services and to increase overall efficiency.

Key watershed resources and management issues for the Nottawasaga Valley are discussed in the Watershed Plan. These topics, which were discussed and analyzed by watershed stakeholders (the Planning Team) within both a rural and urban context include:

- ravine, valley, river and stream corridor management
- natural corridors
- public conservation lands management
- woodlands
- wildlife habitat
- fish habitat
- wetlands shoreline management
- water resources, including groundwater and surface water quality and quantity
- septic systems, septage and sewage
- stormwater management
- development
- communications, education, and information
- funding.

Common themes arising from watershed resources and management topics discussed in this Plan include:

- the preservation, conservation, enhancement, and rehabilitation of natural heritage features
- the preservation and improvement of surface water and groundwater quality and quantity
- the utilization of environmentally sound land use practices
- a need to reduce overlap or duplication of services and programs offered for resource management and a clear identification of who is responsible for what
- enhanced communications for resource management issues and solutions.

In order to address the above noted issues, a number of recommended actions are provided (refer to the inserted chart for a summary of these actions and stakeholder responsibility for implementing these actions). In general, these recommendations can be grouped into 6 key action areas:

- streamlining/coordination - resource management programs and services must be streamlined and coordinated in order to provide an efficient delivery of services.

- **partnerships** - where there is a need in natural resource management for improved efficiency, shared expertise, better communications, shared funding, or improved conservation or preservations, partnerships should be considered.
- **land stewardship** - there needs to be accessible information and support in place to allow watershed residents to become environmental stewards of their land.
- **taking responsibility** - all stakeholders must recognize their responsibility in natural resource management.
- **effective communications** - effective communications are a key component of watershed management as they can: improve land use practices; change attitudes; create awareness; and improve relations between watershed stakeholders.
- **natural resource policies** - natural resource policies should be implemented in a fair and equitable manner, reflecting both the intent of provincial policy and local watershed community conditions.

The goals, objectives, and recommendations of the Management Plan can be implemented through land use planning documents, subwatershed plans, local agency policies and programs, and land stewardship initiatives. The need for revisions to the Plan will be determined through continuous review by the Planning Team and the Full Membership of the N.V.C.A and yearly Planning Team meetings. In addition, monitoring the success and performance of the mechanisms used to achieve the objectives developed in the Plan will be through: water quality and quantity sampling and monitoring; fish and wildlife trend data; the Watershed Report Card; and an effectiveness questionnaire circulated to municipalities, Planning Team members, and other stakeholders.

Overall, it is the intent of the Watershed Management Plan to: provide direction for resource management in the Nottawasaga Valley; to coordinate policies and legislation as they apply to land use planning and management; and serve as a guide for the implementation of resource management issues through municipal planning documents.

**Actions for a Sustainable
Nottawasaga Valley Watershed:
Responsibilities for
Implementation.**

Scan pages xii and xiii

* Note: Although the Plan is based on provincial policy, it does not have legal status.

The watershed Plan does not create any new policy or legislation. Rather, it reflects current policies and legislation*. Therefore, the information in the Plan can be used as seen fit by a municipality or government agency for guidance when making land use decisions. The Municipality is ultimately responsible for making land use decisions, and the Watershed Plan is merely one of many sources of information available to assist decision makers.

Nottawasaga Valley Conservation Authority Endorsement

WHEREAS: The Nottawasaga Valley Conservation Authority Management Plan has been prepared in accordance with the guideline document Water Management on a Watershed Basis: Implementing an Ecosystem Approach prepared by the Ministry of Environment and Energy and Ministry of Natural Resources; and,

WHEREAS: Watershed planning and management which integrates resource management and land use planning, is an ecosystem approach that protects ecosystems as land uses change; and,

WHEREAS: Conservation Authorities have taken a coordinating role in watershed planning and management, the Nottawasaga Valley Conservation Authority has worked in cooperation with watershed municipalities, residents, government organizations, the development industry, non-governmental organizations special interest groups, the adjacent conservation authorities to prepare a watershed management plan for the Nottawasaga Valley; and

WHEREAS: The goal of the Watershed Plan is “the conservation of natural resources in a cooperative, integrated manner in which human needs are met in balance with the need to sustain the natural environment”; and,

WHEREAS: The Watershed Plan is based on principles that reflect: an ecosystem approach to planning and management; the protection of water systems’ innovative technology; proactive resource management; a fair and equitable process; land owner rights, privileges and responsibilities; streamlining, cooperation and integration; and education; and,

WHEREAS: The implementation of the Watershed Plan will occur through the coordination and integration of current legislation, policy and programs; therefore

BE IT RESOLVED THAT: The Nottawasaga Valley Conservation

Authority endorses the goals, objectives, and general intent of the Nottawasaga Valley Watershed Management Plan dated April, 1995, including amendments as outlined in Attachment "D-1"



Bill MacKenzie
N.V.C.A. Chair



Wayne R. Wilson
N.V.C.A. C.A.O./Secretary Treasurer

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Glossary

This glossary is a summary of common terms used throughout the Watershed Plan. These definitions are in the context of this Watershed Plan. Please note that many of these definitions were obtained from sources cited in the reference section of the Plan.

Aquifer - An underground formation of permeable rock or loose material which can produce useful quantities of water when tapped by a well.

Area of Natural and Scientific Interest (ANSI) - Areas of land and water containing natural landscapes or features that have values related to protection, natural heritage appreciation, scientific study or education. Depending on the features of particular areas, they may be referred to as life science or earth science sites. These areas vary in their level of significance and their vulnerability to environmental impacts.

Bio-Engineering - An applied science that combines engineering, biological and ecological concepts to construct living structures for erosion and sediment control.

Conservation - The wise use, protection, and rehabilitation of natural resources according to principles that will assure their highest economic, social and environmental benefits.

Corridor - The naturally vegetated or potentially revegetated areas that link or border natural areas and provide ecological functions such as habitat, passage, hydrological flow, connection or buffering from adjacent impacts. They can also occur across or along upland, lowlands, or slopes

Cumulative Impact - The environmental impact that results from actions, which when added to others of the past, present, and in the foreseeable future, will have a total effect.

C.U.R.B. - Clean Up Rural Beaches.

Discharge Zone - The point where water reappears above the ground. This point may include where groundwater flows into streams, rivers, marshes, lakes, oceans, springs, and flowing wells.

Ecosystem - an ecosystem consists of the air, land, water, and living organisms, including humans, and the interactions among them. It includes the community of living things and the complex of physical and chemical factors forming the environment.

Endangered Species - Any indigenous species of fauna or flora that, on the basis of the best available scientific evidence, is indicated to be threatened with immediate extinction throughout all or a significant portion of its Ontario range.

Environmental Impact Study - A study prepared in accordance with established procedures to identify and assess the impacts of development on a particular significant natural heritage feature.

Flood Plain - The area, usually lowlands, adjoining a watercourse which has been, or may be covered by flood water. In general, the flood plain is a part of the river's natural space in times of flooding.

Goal - The aim or vision of stakeholders towards an ideal state of the watershed.

Groundwater - Water located below the surface of the ground **Habitat** - The place where an animal or plant naturally or normally lives. It is composed of food, water, shelter, and space.

Headwater - The source of a stream.

Hydrologic Cycle - The cycle of water movement from the atmosphere to the earth and back to the atmosphere through various stages of processes, as precipitation, interception, runoff, infiltration, percolation, storage, evaporation, and transpiration

Land Stewardship - A land and water conservation program to assist watershed landowners and residents in becoming environmental stewards of their land.

M.O.E.E. - Ministry of Environment and Energy

M.M.A.H. - Ministry of Municipal Affairs and Housing.

M.N.R. - Ministry of Natural Resources.

Natural Heritage - Natural heritage is a concept used across North America as a framework and context for initiatives to conserve and steward natural areas, species, and ecosystems at risk. Natural Heritage includes geological features and landforms; associated terrestrial and aquatic ecosystems; their plant species, populations and communities; and all native animal species, their habitats and sustaining environment.

N.G.O. - Non Governmental Organization.

N.V.C.A. - Nottawasaga Valley Conservation Authority

Objective - A quantifiable target to be achieved.

A.M.A.F.R.A. - Ontario Ministry of Agriculture, Food and Rural Affairs.

One Window Approach - A coordinated approach to the delivery of local environmental protection and natural resource management that rectifies the “maze” of services that are often duplicated or overlapped.

Preservation - Ensuring that significant natural resources remain in their natural state and are not threatened by any changes in land use.

Principle - Fundamental elements of resource management

Provincially Significant Wetland - Class 1, 2, and 3 wetland in that part of the Great Lakes - St. Lawrence Region below the line approximating the south edge of the Canadian Shield, defined in “An Evaluation System for Wetlands of Ontario South of the Precambrian Shield. Second Edition, 1984”. as amended from time to time; and those Wetlands identified as Provincially Significant Wetlands by the Ministry of Natural Resources through an evaluation system(s) developed specifically for other areas of Ontario.

R.A.P. - Remedial Action Plan.

Recharge Zone - Where runoff from precipitation and snow melt seeps into the soil and becomes groundwater.

Rehabilitation - The returning of land to its prior use or productivity.

Remediation - The rehabilitation of a site for valuable land uses but not necessarily restoring the site to its original natural state.

Resource Management - the wise use of a particular natural resource to achieve specific ends.

Restoration - the altering or re-establishment of a site to a defined, indigenous, historic condition.

Significance - Natural features and functions that are ecologically important to the natural environment in terms of amount, content, representation, or effect, thereby contributing to the quality and integrity of an identifiable ecological region or natural heritage system.

Stakeholder - An individual who has a personal investment or interest in the watershed planning and management process.

Stormwater Management - The planned set of public policies and activities undertaken to regulate stormwater runoff under various specified conditions within various portions of the urban drainage system. In general, stormwater management is primarily concerned with limiting future flood damages and environmental impacts resulting from development

Subwatershed - The land drained by an individual tributary to the main watercourse.

Threatened Species - Any indigenous species of fauna or flora that, on the basis of the best available scientific evidence, is indicated to be experiencing a definite non-cyclical decline throughout all or a significant portion of its Ontario range, and that it is likely to become an endangered species if the factors responsible for the decline continue unabated.

Vulnerable Species - Any indigenous species of fauna or flora that is particularly at risk because of low or declining numbers, occurrence at the fringe of its range or in restricted areas, or for some other reason, but is not a threatened species.

Water Quality - The chemical, physical, and biological condition of water related to beneficial use.

Watershed - The land drained by a river and its tributaries.

Watershed Management Plan - A document developed cooperatively by government agencies and other stakeholders to manage the water, land/water interactions, aquatic life, and aquatic resources within a particular watershed, in order to protect the health of the ecosystem as land uses change.

Watershed Planning - A form of holistic planning that integrates watershed ecosystem resource management and land use planning.

Wetland - Lands that are seasonally or permanently covered by shallow water, as well as lands where the water table is close to or at the surface. The presence of abundant water causes the formation of hydric soils and favours the dominance of either hydrophytic or water tolerant plants. The four major types of wetlands are swamps, marshes, bogs, and fens.

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Introduction

AN ECOSYSTEM APPROACH TO LAND USE PLANNING AND MANAGEMENT

In recent years there has been a call to adopt an ecosystem approach to land use planning. Reports by the Royal Commission on the Future of the Toronto Waterfront, the Commission on Planning and Development Reform in Ontario, the Ontario Roundtable, the Environmental Assessment Advisory Committee, and the Conservation Council of Ontario outline the importance of integrating ecosystem considerations into the planning process (M.O.E.E. and M.N.R., 1992). The Ministry of Environment and Energy and the Ministry of Natural Resources (1992) have also identified that this call is based on the general agreement that the current planning process does not provide a satisfactory means of protecting the environment, especially in terms of the negative cumulative environmental effects of development.

The ecosystem approach recognizes that ecosystems have limits to stress and accommodation should be made before there is irreversible degradation or destruction to the system (M.O.E.E. and m.N.R., 1992). This approach requires that ecological goals be treated equally with, and considered at the same time as, economic and social goals. By integrating ecosystem considerations into the planning process, the following key elements can be achieved:

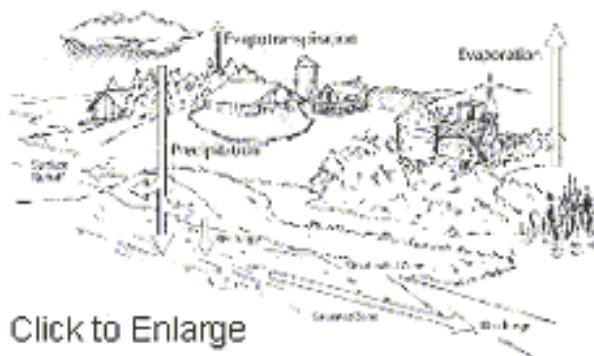
The ecosystem approach recognizes that ecosystems have limits to stress and accommodation should be made before there is irreversible degradation or destruction to the system

- *assurance that development decisions will not prejudice future ecosystems and human health*
- *significant savings, as the need for costly and difficult remedial action after the fact will be avoided*
- *a more efficient development review process as ecosystem planning and management will provide better upfront guidance on the location, type, and timing of development.*

As ecosystems are connected, an action or change in one location of a watershed has the potential for impacting many other natural features and processes that are linked by the interactive movement of surface and ground water

As discussed in **Water Management on a Watershed Basis: Implementing an Ecosystem Approach**, the primary boundary for an ecosystem approach to land use planning and management should be the watershed. The basis for using the watershed as a boundary is the hydrologic cycle. This cycle, as illustrated in Figure 1, integrates the physical, chemical, and biological processes of the ecosystem. One reason for basing land use and resource management on the watershed is that water moves continuously through watersheds, and influences numerous life cycles and physical processes throughout its course. As ecosystems are connected, an action or change in one location of watershed has the

Figure 1: The Hydrologic Cycle



- precipitation becomes surface water, soil, moisture, and groundwater
- groundwater circulates back to the surface, and from the surface all water returns to the atmosphere through evaporation and transpiration
- when precipitation falls on the land surface, part of the water runs off into lakes and rivers
- some of the water from the melting snow and from rainfall seeps into the soil and percolates into the saturated zone - this process is called "recharge"
- this water eventually reappears on the land surface - this is called "discharge"
- discharge points: streams, marshes, lakes, oceans, springs, and flowing wells.

Potential for impacting many other natural features and processes that are linked by the interactive movement of surface and groundwater (M.O.E.E. and M.N.R., 1992). In addition, it is important to base land use and resource management on a watershed basis because water related issues are of primary importance in these times. To integrate resource management and land use planning, a Watershed Plan should be undertaken. A watershed plan provides direction for managing water, land/water interactions, and aquatic resources within a particular watershed, in order to ensure the health of the ecosystem as land uses change. The Nottawasaga Valley Watershed Plan provides recommendations on how water resources will be protected and enhanced and it also "sets the stage" for the undertaking of smaller scale, more intensive subwatershed management plans.

STAKEHOLDERS IN WATERSHED PLANNING AND MANAGEMENT

The preparation, implementation, and monitoring of the Watershed Plan is coordinated by the Nottawasaga Valley Conservation Authority. This role is based on the mandate for conservation authorities, which includes the power to study and investigate the watershed and to determine a program whereby the natural resources of the watershed may be conserved, restored, developed, and managed. However, the N.V.C.A. is only one player in watershed planning and management. The following stakeholders all play an important role in this process:

- *upper and lower tier municipalities*
- *watershed residents*
- *government agencies and organizations*
- *non-governmental organizations*
- *the development industry*
- *special interest groups*
- *adjacent conservation authorities*

Representatives from the above group have provided significant direction for the preparation of the Watershed Plan and we anticipate their support will continue through the implementation and monitoring stages of the Plan. We believe that through continued stakeholder support, planning and management in the Nottawasaga Valley will continue to be based on sound ecological principles

THE PURPOSE OF THE WATERSHED PLAN

The following broad objectives were established as the basis for the Watershed Plan:

1. *To identify existing and potential problems and concerns with regard to:*
 - *natural resources - particularly water related resources*
 - *land use practices and management*
 - *administration, organization, and communication.*
2. *To identify factors that contribute significantly to the above noted potential problems and concerns and determine short term and long term strategies/recommendations to rectify them.*
3. *To identify means by which to effectively inform the public and all relevant parties about resource management policy, legislation, programs, and services.*
4. *To set priorities for resource management in order to ensure community needs are being addressed without compromising the present and future health of the environment.*
5. *To build on past and present successes by documenting existing measures which are consistent with the Watershed Plan.*

6. *To identify and prioritize subwatersheds for further study and remediation.*
7. *To provide background support and direction for municipal planning documents and Ontario Municipal Board hearings.*

Source:

Environment Canada, Groundwater - Natures Hidden Treasure (Ottawa: Environment Canada), p.5

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Background

THE NOTTAWASAGA VALLEY WATERSHED

Location

The Nottawasaga Valley Watershed lies within the Counties of Simcoe (74%), Dufferin (22%), and Grey (4%). The northern boundary of the Conservation Authority's jurisdiction is Nottawasaga Bay. The watershed is bounded to the south by the Humber and Credit River Watersheds. The Niagara Escarpment forms part of the western boundary, separating the Nottawasaga from the Grand and Saugeen Watersheds. On the east, the Nottawasaga Watershed is bounded by the numerous streams which drain into Lake Simcoe (see Figure 2) There are 3 counties and 18 municipalities within the Watershed that are entirely or partially within the jurisdiction of the Nottawasaga Valley Conservation Authority (see Figure 3). These upper and lower tier municipalities include:

County of Simcoe

Township of Adjala-Tosorontio
City of Barrie
Town of Bradford West-Gwillimbury
Township of Clearview
Town of Collingwood
Township of Essa
Town of Innisfil
Town of New Tecumseth
Township of Oro-Medonte
Township of

County of Dufferin

Township of Amaranth
Township of Melancthon
Township of Mono
Township of Mulmur
Town of Shelburne

County of Grey

Township of Collingwood
Township of Osprey

Figure 3:
Nottawasaga Valley Watershed Municipalities



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The Nottawasaga River is approximately 122 km in length along its main channel and has a drainage area of 3,361 sq. km. The main branch of the river's source is in the till moraines of Amaranth Township at an elevation of almost 490 metres. The Nottawasaga River has a total drop of 310 metres to its outlet into Georgian Bay and has an average gradient of 2.6 metres per km. However, in the upper reaches of the river, the gradient is as much as 19 metres per km (at its outlet in Georgian Bay).

The Nottawasaga River has 6 primary tributaries; the Boyne River the Mad River, the Pine River, Innisfil Creek, Bear Creek, and Willow Creek (see Figure 4). In addition to the Nottawasaga's major drainage basin, four streams draining directly into Georgian Bay from the Niagara Escarpment are in the Nottawasaga Valley Conservation Authority's jurisdiction. These watercourses, all located in the north western section of the Authority's jurisdiction include; the Pretty River, Batteaux River. Silver Creek, and Black Ash Creek.

An unusual characteristic of the Nottawasaga Valley Watershed is its virtual lack of natural lakes. In fact, Little Lake, which has an area of approximately 235 ha, is the largest lake in the Watershed. The Nottawasaga Valley Watershed exhibits a diversity of landscapes, ranging from the vertical cliffs of the Niagara Escarpment, to the rolling topography of the numerous moraines and the broad flats of the Simcoe Lowlands. Therefore, an understanding of the watershed requires an identification of the form and function of the natural features and systems which characterize it.

As such, the next section will briefly discuss the Watershed in terms of:

- *glacial history*
- *geology*
- *physiography*
- *groundwater*
- *wetlands*
- *fish habitat*
- *wildlife habitat*

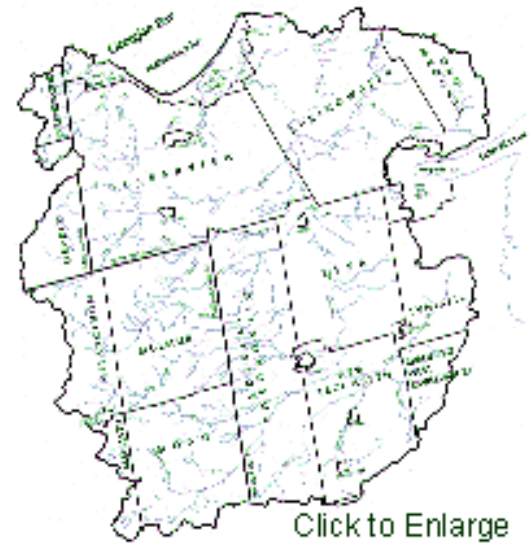
NATURAL CHARACTERISTICS OF THE NOTTAWASAGA VALLEY WATERSHED

Glacial History

The geologic history of the Nottawasaga Watershed during the Pleistocene Era is of significance for interpreting the current landscape. Most of the present-day landforms came into being during the past 20,000 years and owe their existence to glacial processes.

GEOLOGY

The bedrock or basement structure within the Nottawasaga Valley Watershed consists of sedimentary rocks, such as shale and limestone that are approximately 300 to 400 million years old. These rocks comprise the Lorraine, Queenston, Black River, and Trenton formations of the Ordovician time period (435 - 500 million years ago) which are overlain formations from the Lockport and Silurian time period (395-495 Million years ago). These formations are most evident in the cliff-like outcrops of the Niagara Escarpment, one of the most prominent features of the Watershed. In most areas of the Nottawasaga Valley, the bedrock is blanketed by thick glacial till, gravels, sands, and clays deposited during the Wisconsinian Glaciation (approximately 10,000 years ago).



PHYSIOGRAPHY

The dominant physiographic features within the Nottawasaga Valley Watershed have been formed or altered by extensive glacial activities of the ice ages. The Watershed extends across several of the physiographic regions of Southern Ontario; the Simcoe Lowlands, the Simcoe Uplands, the Niagara Escarpment, the Oak Ridges Moraine, the Horseshoe Moraines, the Peterborough Drumlin field, and the Schomberg Clay Plains (see Figure 5). The majority of the Nottawasaga Valley is within the Simcoe Lowlands region, which includes: the clay plains of Elmvale, Minesing, and Stayner; and the sand plains of Tecumseth, Essa, and Camp Borden. These clay and sand flatland areas represent the extent of the glacial Lake Algonquin within the Watershed.

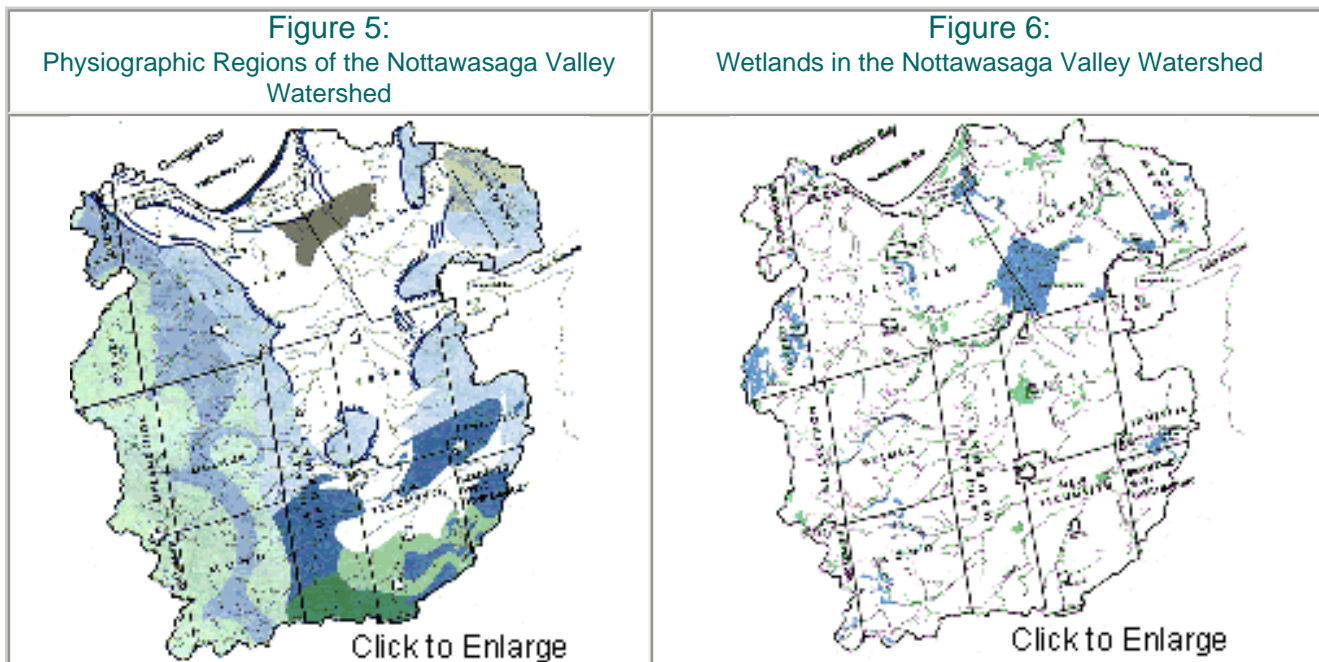
Many of the headwater areas of the Nottawasaga Valley Watershed are found within various physiographic regions. The Niagara Escarpment and the Horseshoe Moraines (Gibraltar, Banks, and Corn Hill Moraines) are source areas for the upper reaches of the Nottawasaga River, as well as the Pine, Boyne, Sheldon, Pretty, Black Ash, and Batteaux systems. The Peterborough Drumlin Field and the Oak Ridges Moraine are the source areas for Beeton Creek and Bailey Creek. The Simcoe Uplands, which includes the Oro Moraine, is the headwater area for Matheson and Willow Creeks.

GROUNDWATER

There is incomplete data for groundwater in the Nottawasaga Valley Watershed. At the time this document was published, the only comprehensive information available for groundwater was probability for water supplies in deep overburden for Northern and Southern Simcoe County.

WETLANDS

There are approximately 1,390 sq. km hectares of evaluated wetland in the Nottawasaga Valley Watershed. Of these wetlands, approximately 6 percent are Provincially Significant (Class 1 to 3) and approximately 3 percent are locally significant (Class 4 to 7) (see Figure 6).



The Minesing Swamp, located in the Township of Springwater and the Township of Clearview, is the largest wetland in the Watershed. This swamp being over 7000 hectares in size, has been acknowledged as a world class resource of international significance.

FISH HABITAT

The Nottawasaga Valley Watershed contains a wide variety of provincially significant fish habitat. Significant recreational fishing opportunities are provided in the abundance of coldwater streams and rivers throughout the Watershed. Salmon, rainbow trout, and brook trout are relatively common in the headwater reaches of most coldwater rivers and streams. The warm water rivers and streams in the Watershed are also highly productive and contain a diverse fish community. These streams and rivers are generally located in the lower reaches of the Simcoe Lowlands and the M.N.R. notes that in most cases, coldwater species migrate through these reaches to get to upstream spawning beds.

WILDLIFE HABITAT

As indicated in [Figure 7](#), there is a wide variety of wildlife habitat in the Nottawasaga Valley Watershed. This figure highlights a small portion of defined habitat areas of significance and one must remember that there are areas, such as small woodlots, fence rows, corridors, and valleylands that also provide valuable

habitat for wildlife.

LAND USE

There are a number of predominant land uses within the Nottawasaga Valley Watershed. Some of these land uses include:

AGRICULTURE

Agriculture is the dominant land use in the Nottawasaga Valley Watershed. There are approximately 1,940 farms in the Watershed, with an overall area of approximately 150,000* hectares. In general agriculture in the Watershed is characterized by the family farm with less than 250 acres of land. These farms typically raise livestock, and grow crops such as barley, corn, and alfalfa. However, the topography and soil types in some areas of the Watershed have led to pockets of specialized forms of agriculture.



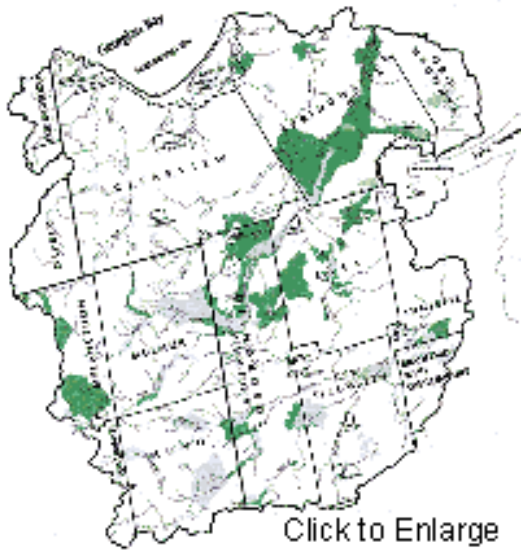
Potato farming in the Alliston area

The sandy soils around the Community of Alliston have been predominately used for potato farming, while the flat topography of the Town of New Tecumseth and the Town of Innisfil has led to the operation of a number of large sod farms. In fact, approximately 15 percent of Canadian sod production comes from these areas. Also the moderating effect of Georgian Bay and Niagara Escarpment provides ideal conditions for apple growing in the Collingwood area, and the organic soils found in the Town of Innisfil and the Town of Bradford-West Gwillimbury have been utilized for market gardening crops.

Recreation

There are a number recreational land uses in the Nottawasaga Valley Watershed. Land uses associated with some of the more prominent features include:

Figure 7



* Niagara Escarpment	skiing hiking
* Georgian Bay/Wasaga Beach	Boating/sailing beach activities golfing fishing
Nottawasaga River and Tributaries	canoeing fishing golfing hiking
* Minesing Swamp	canoeing hunting nature watching
Osprey Westland	hunting canoeing

* denotes world class significance

In addition to these recreational uses, there are 4 Provincial Parks and 12 Conservation Areas in the Watershed that provide visitors with day use of camping facilities. Furthermore, there are trails throughout the watershed, such as Bruce and Ganaraska Trails, and abandoned rail lines that provide opportunities for hiking, skiing, snowmobiling, and nature watching.

Industry/Commercial

There are a number of large and small scale businesses located in the Nottawasaga Valley Watershed. They are predominately located in urban areas of the watershed and normally represent light industrial uses. Given the glacial till, sand, and gravel deposits within the Nottawasaga Valley, there is an extensive aggregate extraction industry in the area.

Residential

The total population of the Watershed is approximately 120,000 people* and it is expected that this population will increase by approximately 25 percent in the next 25 years (M.N.A.,1993, p.8). Most residents live in towns, villages, and hamlets across the Watershed As the Nottawasaga Valley Watershed is approximately one hour north Metropolitan Toronto, many towns and urban centres have experienced rapid residential growth in the past two decades. For example, forecasts suggest that the County of Simcoe, which is experiencing growth rates twice the provincial average, will experience a population increase from 300,000 in 1991 to 400,00 in 2001 (Hemson, 1995). The town of Wasaga Beach and the Town of Collingwood are also experiencing rapid residential growth (including seasonal residential), due to the recreational opportunities available in these areas. There are also a number of rural residential units throughout the watershed along county, concession and side roads.

*Note: approximately 1/4 of the population of the City of Barrie is located within the watershed



Residential development in the City of Barrie

Goal and Principles

Conservation - The wise use, protection, and rehabilitation of natural resources according to principles that will assure their highest economic, social and environmental benefits.

Natural Resources - The land, fish, wildlife, biota, air, water groundwater, and drinking water supplies of the Nottawasaga Valley.

Watershed - The land drained by the Nottawasaga River, Pretty River, Batteaux River, Black Ash Creek, and Silver Creek and their tributaries

Cooperative - An agreeable collaboration.
Integrated - A coordinated, holistic approach

Human Needs - Requirements such as housing, food, employment, recreation, and a healthy environment necessary to sustain life

Balance - Having equal

The goal of the Watershed Plan is the conservation of natural resources within our watershed in a cooperative, integrated manner in which human needs are met in balance with the need to sustain the natural environment.

The Watershed Plan is based on the following principles:

Ecosystem Approach

It is recognized that the ecosystem approach, which considers the interconnection of the environment, is the fundamental principle of watershed planning; and that this document promotes the watershed area as the basis for environmental planning and management for surface water resources.

Protection of Water Systems

All land use and natural resource management activities will recognize watershed systems such as headwater streams, watercourses, groundwater, lakes and related riparian systems as valuable natural features and will attempt to protect natural functions of these systems. Attempts should also be made to restore the functional character of ecosystems that have been degraded by previous land use activity.

Innovative Technology

The most currently accepted technology that is available will be used to manage water resources in a way that maintains, and where possible enhances, the health of the watershed systems. Innovative approaches to address resource management needs and administrative requirements will also be encouraged and employed

Proactive Resource Management

Cost effective proactive management of natural resources should be emphasized over cost intensive reactive management.

Economic Considerations

Economic considerations, both short and long term, will be recognized when

consideration for both human needs and the needs of the environment

Sustain - Support over the long term through conservation.

Natural Environment -

The air, land, plants, animals, and water, or any combination thereof in the Nottawasaga Valley.

making natural resource management decisions. Where alternatives are available, the selection of economic options may be preferred.

Landowner Rights, Privileges, and Responsibilities

Individual and societal rights, privileges, and responsibilities must be recognized and addressed throughout the planning process .

Consultation

There will be direct consultation between government agencies/ organizations and municipalities when undertaking resource management actions in the Watershed. Where resource management actions directly affect other stakeholders, those stakeholders will be consulted as well.

Fair and Equitable Process

Fairness and equity will be applied to the ecological, social and economic considerations inherent in watershed planning and management. The process will provide the opportunity for representation from all stakeholders and will recognize that everyone is an important part of the team.

Education

Communication of information on watershed planning and management and the sharing of knowledge about local watersheds is essential. One of the foundations of watershed planning and management is to develop community awareness and to empower all of the partners to make informed decisions. Through enhanced community awareness of the need for sound ecological planning and management policies, watershed stakeholders can do their part in the sustainable development process.

Streamlining

Integration and cooperation of all resource management agencies, municipalities, and other key stakeholders should occur. Integration and cooperation can be accomplished through:

the coordination of a wide variety of resource management agencies which results in maintaining or increasing public service at reduced cost.

an accessible data base of environmental information to enable the sharing of ecological problems and solutions

a timely and efficient process for assisting in the formation of new or updated official plan policies and zoning by-laws in keeping with the environmental goals and objectives of the Watershed Plan

a coordinated and acceptable monitoring system which can be used to assist municipal councils, agencies, and the public to maintain their commitment to watershed management

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The Goal of the Watershed Plan is the conservation of natural resources within our watershed in a cooperative, integrated manner in which human needs are met in balance with the need to sustain the natural environment.

Watershed Resource Issues and Recommended Management Actions

INTRODUCTION

The Watershed resource issues and recommended management actions section of the Watershed Plan considers the following topics in the Nottawasaga Valley:

- ravine, valley, river, and stream corridor management
- natural corridors
- Public Conservation lands management
- woodlands
- wildlife habitats
- fish habitat
- wetlands
- shoreline management
- water resources, including surface water and ground water
- septic systems, septage, and sewage
- stormwater management
- flooding
- erosion
- development
- communications, education, and information
- funding.

This section is organized in the following manner:

Background - A general description of the resource management topic, including a discussion specific to the Nottawasaga Valley Watershed.

Issues - A discussion of watershed issues related to the resource management topic

Objective - A specific objective broadly describing how the resource management topic should be addressed is provided.

Recommendations - Recommendations that address concerns or requirements for the resource management are given. The recommendations generally reflect those that the Planning Team agreed would best address the needs and requirements of the topic (for further detail on this process please see Appendix: Watershed Plan Preparation). The time frame for recommendations generally ranges from 0 to 5 years (for implementation to be

initiated) and those recommendations that will take a longer time to implement are noted as long term considerations.

The recommendations provided in the watershed resources and management section are integrated in the implementation section of the Watershed Plan. In particular, Figure 13 identifies key recommendations or actions of the Watershed Management Plan and provides a summary of stakeholder responsibility for the implementation of these recommendations. Therefore, when reading this section one may wish to refer to Figure 13 for further details on the recommended actions.

Given that many of the water resources and management topics discussed in the Plan are affected by planning legislation, a brief discussion on relevant legislation is needed.

PLANNING LEGISLATION IN ONTARIO

In the early 1990's, it was identified that the land use planning system in Ontario needed to be reformed. This need for reform was based on growing concerns that:

- the integrity of the planning system was being lost mainly because of the influences that some developers exerted in several municipalities
- land use decisions were having a negative impact on the environment and that the existing planning system was not able to protect the natural environment
- the system was wrought with red tape and delays.

Based on the extensive work of the Commission on Planning and Development Reform, the Province has reformed the planning system. This reform legislation, The Planning and Municipal Statute Law Amendment Act 1994 (Bill 163) was given Royal Assent on December 8, 1994. This new planning system is led by a comprehensive set of broad, integrated provincial policies. These policy statements, which are divided into 6 main goals, include clear provincial priorities regarding the environment.

It should be noted that the revised Planning Act places the primary role and responsibility for land use planning decisions with upper tier and lower tier municipalities. Resource management agencies are responsible for providing technical support and information to municipalities so they are able to make sound decisions.

Since the Watershed Plan directly deals with Goal A: Natural Heritage, Environmental Protection and Hazard Policies of the *Comprehensive set of Policy Statements*, this section will consider these policies. For further details on all the policy statements, please refer to the *Comprehensive set of Policy statements*.

GOAL A: NATURAL HERITAGE, ENVIRONMENTAL PROTECTION AND HAZARD POLICIES

These policies relate directly to the protection of the environment. There are three main goals for the Natural Heritage, Environmental Protection and Hazard Policies:

- Goal 1:** To protect the quality and integrity of ecosystems, including air, water, land and biota; and where quality and integrity have been diminished, to encourage restoration and remediation to healthy conditions.
- Goal 2:** To ensure that wetlands are identified and adequately protected through the land use planning process and to achieve no loss of Provincially Significant Wetlands.
- Goal 3:** To ensure that development is not permitted in areas where site conditions or location may pose a danger to public safety or public health or result in property damage; and to encourage a coordinated approach to the use of the land and the management of water in areas subject to flooding, erosion, and dynamic beaches in order to minimize social disruption.

In order to achieve Goals 1 and 2, key natural features such as corridors, habitat areas, woodlands, water systems, and wetlands are protected through these policies. Goal 3 is addressed through the restriction of development in areas where natural or other hazards to human health and safety may result. Overall, all of the components of the Natural Heritage Policy came together to of the system are promoted as a whole. In addition to the Comprehensive Set of Policy Statement, there is a variety of legislation that deals with resource management issues in Ontario.

Examples of legislation relevant to watershed planning and management include:

Legislation

Planning Act

Municipal Act

Conservation Authorities Act

Environmental Assessment Act

Environmental Protection Act

Drainage Act

Ontario Water Resources Act

Fisheries Act

Administering Agency

Ministry of Municipal Affairs and Housing

Ministry of Municipal Affairs and Housing

Conservation Authority

Ministry of Environment and Energy

Ministry of Environment and Energy

Ministry of Agriculture Food, and Rural Affairs

Ministry of Environment and Energy

Department of Fisheries and Oceans

Lakes and Rivers Improvement Act

Ministry of Natural Resources

Beds of Navigable Waters Act

Ministry of Natural Resources

Public Lands Act

Ministry of Natural Resources

Aggregate Resource Act

Ministry of Natural Resources

Resources Game and Fish Act

Ministry of Natural Resources

**Niagara Escarpment Planning Ministry of
Environment and Development Act**

**Ministry of Environment and Energy and the
Niagara Escarpment Commission**

Ontario Municipal Board Act

Ministry of the Attorney General Resources

Where any Act or portion of an Act is referred to in this Watershed Plan, such references shall be interpreted to include any subsequent legislation that may replace or revise the specified Act.

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Ravine, Valley, River, and Stream Corridor Management

BACKGROUND:

Ravine, valley, river and stream corridors are important natural resources as they are the natural water collection systems for watersheds and they also convey and provide short term storage for storm and melt waters. In addition, these corridors perform important ecological functions such as: nutrient and sediment transport; the provision of fish and wildlife habitat and migration routes; air quality improvement; noise level attenuation; maintenance of indigenous flora and fauna; and the creation of microclimates. In fact, in many parts of the intensively farmed landscape within the Watershed, these lands represent the only remaining natural habitat. Furthermore, ravine, valley, river, and stream corridors represent an important social, cultural, and often historic resource to many local communities.

ISSUES:

There is a need for a comprehensive ravine, valley, river, and stream corridor management throughout the Nottawasaga Valley. This need arises from the following factors:

- significant degradation of ravine, valley, river, and stream corridors is occurring throughout the Watershed primarily due to the removal of vegetation, cattle access, rural land use, and urbanization
- the integrity of ravine, valley, river, and stream corridors is often vulnerable to the cumulative effects of development
- the connecting function of corridors needs to be protected and enhanced
- development within ravine, valley, river and stream corridors often raises concern for: property damage; loss of life resulting from slope instability and flooding; loss of habitat; and water quality and recharge function impacts.

Soil Bioengineering

Soil Bioengineering is an applied science that combines engineering, biological, and ecological concepts to construct living structures for erosion and sediment control. What follows is an illustrated example of bioengineering on a tributary of Black Ash Creek in the town of Collingwood.

Photo 1 - Spring 1993 This photograph depicts the site prior to soil bioengineering. Note the eroding stream bank in the centre of the photo and several trees falling into the creek

[Click to Enlarge](#)



Photo 2 - Summer 1993 Soil bioengineering begins with the construction of a crib wall designed to protect the eroding slope (as seen in Photo 1. This crib wall is a hollow box-like structure constructed of logs and willow cuttings and it is designed to reinforce slopes

[Click to Enlarge](#)



[Click to Enlarge](#)



Photo 3 - Winter 1993
The soil bioengineered crib wall is complete

[Click to Enlarge](#)



Photo 4 - Spring 1994
The crib wall is starting to grow. Note how the willows are developing

[Click to Enlarge](#)



Photo 5 - Summer 1995
The crib wall is approaching the second year of growth. The willows are growing vigorously, thus providing protection and stability for the stream bank

OBJECTIVE

To actively work with the development community, agricultural community, municipalities, and watershed residents to conserve, preserve, enhance, and rehabilitate ravine, valley, river, and stream corridors, with an emphasis on the values of good corridor management within a comprehensive program.

RECOMMENDATIONS

- municipalities will be encouraged to identify and conserve significant ravine, valley, river, and stream corridors within municipal planning documents
- natural system retention mechanisms such as bioengineering or natural channel design will be encouraged by the N.V.C.A. and local municipalities
- the N.V.C.A. will establish a land stewardship program that includes all watershed stakeholders in corridor management * the N.V.C.A. will incorporate bioengineering projects into the extension conservation services program.

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Natural Corridors

Corridors are naturally vegetated or potentially revegetated areas that link or border natural areas and provide ecological functions such as habitat, passage, hydrological flow, connection or buffering from adjacent impacts. Corridors and connecting links are important aspects of watershed management and natural heritage planning as they offer many environmental benefits. According to the Comprehensive Set of Policy Statements and The Natural Heritage of Southern Ontario's Landscapes, these benefits include:

- increased potential for species movement and reproduction
- increased population sizes for some species
- increased shelter from predation
- buffering from disturbance
- increased local diversity of habitats and successional stages
- reduction of erosion
- retention of countryside character
- the maintenance of genetic variability
- increased recreation and access opportunities, enhanced aesthetic values, and enhanced local quality of life.

The extent of corridors depends on the characteristics of the landscape. On fragmented landscapes, corridors between core areas are often nonexistent, particularly across upland areas. Riley and Mohr (1994) note that many natural corridors still exist because they occur along streams and rivers, valleys and slopes, ancient shoreline slopes, lake valleys, and wet clay plains. Given the rural nature of the Nottawasaga Valley Watershed, there are still many natural corridors

- the protection or remediation of natural corridors many conflict with landowner objectives
- the extent, significance, and recent loss and gain rates of natural corridors needs to be determined
- corridor issues are not currently identified in development review
- given the scarcity of accurate natural corridor mapping information, it may be difficult to implement certain requirements of the new Comprehensive Set of Policy Statements.

To promote the preservation, conservation, enhancement, and rehabilitation of natural corridors in the Nottawasaga Valley Watershed.



RECOMMENDATIONS

- to develop a database to assist in determining the extent, significance, and recent loss and gain rates of natural corridors
- to determine natural corridor conservation and enhancement measures that may be required in the Nottawasaga Valley Watershed
- partnerships between residents, municipalities, governmental agencies, and non-governmental organizations to conserve, restore, and rehabilitate natural corridors will be established.

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Public Conservation Lands Management

BACKGROUND

As illustrated in Figure 8, public conservation lands in the Nottawasaga Valley Watershed consist of:

1. Parks and Public Open Space

Park lands are managed for the public by municipalities, Ministry of Natural Resources, (M.N.R.) and Parks Canada. In the Nottawasaga Valley, these lands include numerous municipal parks, and 11 Provincial parks (see Figure 8)

2. Conservation Areas and other Conservation Authority Lands

Conservation areas are owned and managed by conservation authorities. These lands were established to conserve important watershed resources such as flood plains, valleylands, wetlands, forest regeneration areas, and water management structures. Conservation Authority lands are mainly purchased for their environmental significance. For example, the N.V.C.A. has purchased environmentally significant lands in the Minesing Swamp and Osprey Wetlands. As seen in Figure 8, the N.V.C.A. has 12 Conservation Areas and major landholdings in the Watershed.

3. Crown, County, and Agreement Forests

There are agreements between municipalities, counties, and the M.N.R. to manage woodlands for fibre production, forest regeneration, and woodland conservation.

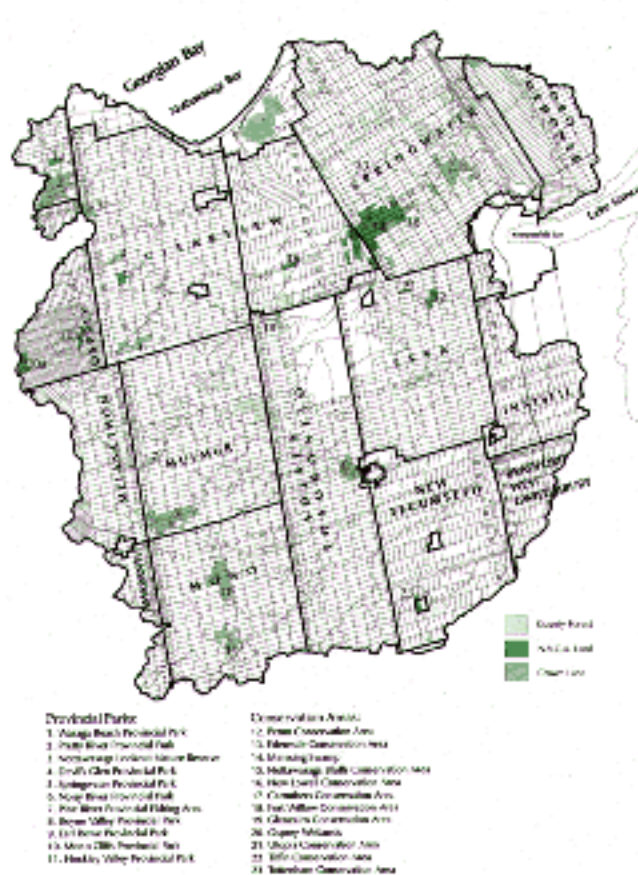
4. Crown Land and Areas of Natural and Scientific Interest

Some M.N.R. Crown land management plans have identified and set aside Areas of Natural and Scientific Interest for the protection of identified natural heritage features.

"The work of conservationists will never end...Perhaps conservationists will always be setting aside lands so that they will not be all absorbed by the throbbing life of urban expansion, so that some lands will be retained as oases of peace for those who toil in the city, so that in years to come these valleys may echo with the laughter of children, so that young people may witness the ever recurring miracle of spring, and so that parents may enjoy the solace of nature for tired bodies and minds."

G. Ross Lord, Past Chair, Metro Toronto Region Conservation Authority in Conservation by the People.

Figure 8: Public Conservation Lands in the Nottawasaga Valley Watershed



[Click to enlarge](#)

Collectively, conservation lands, provincial parks, and crown lands constitute the most significant public holdings of natural heritage areas and features across southern Ontario (M.N.R., 1994, p.37). Public conservation lands are important to many watershed residents as they provide opportunities for recreation, education, and environmental conservation and protection.

ISSUES

- government cutbacks have had a negative impact on the acquisition and management of public conservation lands
- greening initiatives in the Watershed, such as Barrie's Green Communities Initiative and the Collingwood Green Plan, have noted the importance of public greenspace to residents and these programs need to be actively supported
- the management of conservation areas needs to be prioritized
- the N.V.C.A. needs to fully integrate conservation lands within the overall management programs of for the Conservation Authority

OBJECTIVE

To promote the acquisition of high priority public conservation lands and the continued maintenance of existing public conservation lands.

RECOMMENDATIONS

Land Trusts

In general, land trusts are defined by a number of features:

- * they are non-government and operate for the public benefit
- * they are a registered charitable organization
- * they are dedicated to the protection and management of natural areas open space, and agricultural landscapes
- * they work directly with specific parcels of land through purchase, donation, or cooperative landowner programs
- * they are community supported through memberships, donations, and volunteer involvement

- resource management agencies and organizations will encourage establishment of land trusts in the watershed
- for the management of conservation areas and lands in the Nottawasaga Valley Watershed, the following will be high priority:
 - the Tiffin and Utopia Conservation area Master Plan will be updated
 - the preparation of a long term master plan for the New Lowell Conservation Area, and the Nottawasaga Bluffs the implementation of the Minesing Swamp Management Plan
 - the preparation of a Master Plan for the Osprey Wetland and the initiation of a committee to manage the recreational use of the area
 - to review the current use of the Willow Creek Depot Conservation Area and identify partnership opportunities with non-governmental organizations for its future management
- the N.V.C.A. will encourage the Nottawasaga Valley Conservation Foundation to focus their efforts on raising funds to acquire more public conservation lands and to maintain existing public conservation lands
- the dedication/bequest of significant natural heritage and open space lands to the Conservation Authority and nonprofit conservation organizations will be encouraged to further the objectives of this Plan
- the N.V.C.A. will develop criteria for conservation lands acquisition and consider leasing options for conservation areas.

The Minesing Swamp Management Plan

In the early 1990's, it was recognized that there were a number of issues threatening the long term protection of the Minesing Swamp. In order to address this, the Nottawasaga Valley Conservation Authority and the Ministry of Natural Resources undertook a Management Plan process for the Minesing Swamp One of the main driving forces behind the Minesing Swamp Master Plan was the Minesing Swamp Advisory Team. This team, which had stakeholder representation from local residents, landowners, interest groups, non-governmental organizations, and governmental organizations identified and discussed a number of issues regarding the Minesing Swamp The goal of the Management Plan is to prepare and restore where appropriate and feasible, through sound management, the ecological functioning of the Swamp and to direct management efforts to successfully integrate wildlife interests with important human uses and activities.

The objectives of the Plan are:

- to protect the integrity of the Minesing Swamp
- to secure critical lands necessary for the protection of the Minesing ecosystem
- to promote compatible educational and recreational opportunities within the Minesing Swamp
- to demonstrate the positive aspects of partnerships and the benefits of public involvement in long term resource management
- to examine the area's potential for compatible commercial uses as a means for covering management costs

Overall, the Minesing Swamp Management Plan provides recommended actions to address a number of management issues, and suggests the means for monitoring and evaluating recommended policies, guidelines, and directives.

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Woodlands

BACKGROUND

In general, woodlands are lands occupied by trees, woodlots, and forested areas. The following is a summary of how woodlands contribute to the overall quality of a watershed.

Improving the Environment

Woodlands contribute to environmental quality in the following manner:

- when associated with valleys and steep slopes, woodlands reduce the intensity and volume of stormwater runoff
- Water quality of streams and lakes is improved by adjacent woodlands that provide shade and lower water temperatures
- woodland vegetation removes nutrients, sediments, and toxins from surface water runoff.

Ecological Functions

Woodlands provide important ecological functions such as:

- the provision of critical habitat for migratory birds
- the provision of habitat for many wildlife species, including rare plant species.

Social and Economic Contributions

Socially and economically, woodlands provide an opportunity for:

- recreation and tourism
- cultural and spiritual values
- the sustainable harvest of wood products - that supports local forest industries and provides an income to woodlot owners.

ISSUES

Across southern Ontario, woodland losses have exceeded those of almost any other major ecosystem. The Ministry of Natural Resources (1994) notes that woodland conservation has been until more recently, of less public concern, perhaps because of their original dominance of the landscape. There are a number of woodlands across the Nottawasaga Valley Watershed that provide environmental, ecological, social, and economic advantages to all inhabitants, including wildlife. However, the pressures on or the loss of these woodlots is unknown and detailed mapping indicating the extent of significant woodland coverage in the Watershed is not available at this time.

OBJECTIVE

To promote the preservation, conservation, reforestation, and restoration of woodlands in the Nottawasaga Valley.

RECOMMENDATIONS

- to determine the extent of woodland conservation, reforestation, and restoration measures that may be required in the Nottawasaga Valley Watershed
- resource management agencies will encourage the conservation, reforestation, and restoration of woodlands by working cooperatively with landowners to identify woodland needs, and to provide assistance for reforestation
- Municipalities will be encouraged to incorporate woodland management objectives into official plans, zoning by-laws, and tree cutting by-laws.

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"In relatively undisturbed condition, in adequate amounts, woodlands represent an invaluable attribute of the landscape. Woodlands are an ecological and economic attribute that has not always been recognized and respected in land use planning. Our southern woodlands have been taken for granted

John L. Riley and Pat Mohr, Ministry of Natural Resources in the Natural Heritage of Southern Ontario's Settled Landscapes



Watershed Management Plan

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The Goal of the Watershed Plan is the conservation of natural resources within our watershed in a cooperative, integrated manner in which human needs are met in balance with the need to sustain the natural environment.

WILDLIFE HABITAT

BACKGROUND

Wildlife habitat is the natural land environment where plants animals, and other organisms, survive in self-sustaining populations, and from which they derive services such as cover, protection, or food. Overall, habitat is the combination of living and non-living conditions that animals and plants need to survive and flourish. Although plants and animals have specific individual habitat requirements, all require:

- food
- water
- cover and space needed at different times for reproduction, caring for young, shelter and feeding.

Habitats can change over time due to a number of factors: fire; floods; insects; wind; forest succession; urban and industrial development; and some agricultural and forestry practices. In the Nottawasaga Valley Watershed, the most significant wildlife habitats are found in valleylands, large tracts of County Forest, wetlands, woodlots, fence rows, abandoned right of ways, and shorelines. Wildlife habitat has been protected through a number of means:

- the voluntary conservation of private woodlots, wetlands, and other wildlife habitats
- wetland and ANSI protection and conservation
- the classification of Significant Biological Areas and Deer Yards
- fish habitat protection
- endangered species protection.

ISSUES

In the Nottawasaga Valley Watershed, the most significant wildlife habitats are found in valleylands, large tracts of County Forest, wetlands, woodlots, fence rows, abandoned right of ways, and shorelines.

- habitat, such as the Georgian Bay shoreline is being primarily lost due to human activities
- some wildlife habitat, such as beaver dams, create a costly nuisance with regard to culverts, flooding and road washouts
- there is a need to integrate and coordinate wildlife management throughout the Watershed
- the public may not realize the importance of conserving and preserving habitat areas
- habitat protection has not often involved local people in the past
- there is a lack of adequate legislation with regard to habitat protection

OBJECTIVE

To promote the conservation, restoration, enhancement, and creation of significant wildlife habitat

RECOMMENDATIONS

- to inform and educate the public about the importance of conserving and preserving wildlife habitat areas
- to identify significant wildlife habitat in the Watershed that needs protection or enhancement
- the N.V.C.A. will work in conjunction with landowners, municipalities, non-governmental organizations, and the M.N.R. to restore degraded habitats through a comprehensive land stewardship program
- partnerships between agencies and landowners will be formed to establish field sites which demonstrate practical and affordable techniques that may increase the compatibility between land management practices and wildlife habitat.

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FISH HABITAT

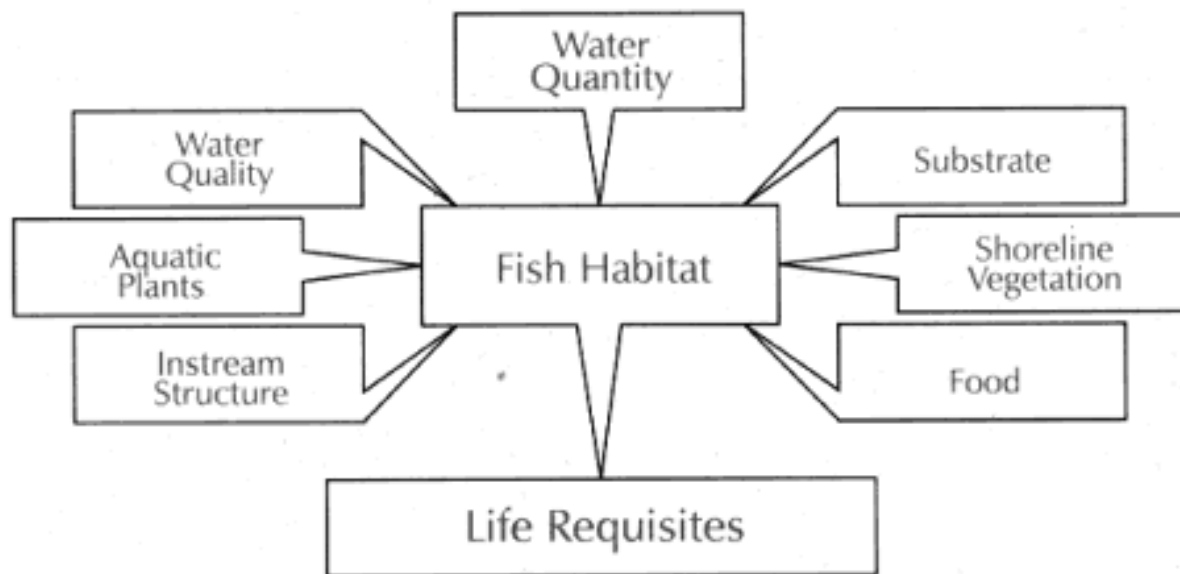
BACKGROUND

Fish and their habitats have intrinsic value as a significant and vital element of natural ecosystems. Individual species of fish possess varying tolerances to environmental change, hence they are valuable indicators of the health of the environment.

Fish habitat includes the spawning grounds, nursery, rearing, food supply, and migration areas on which fish depend directly or indirectly in order to carry out their life processes. As illustrated in Figure 9, there are a number of fish habitat requirements for survival, and these requirements will vary with the life stage, season, and even time of day. In general, wetlands, groundwater recharge areas, aquifers, and the quantity and quality of groundwater and surface water are all important factors in maintaining the quality and quantity of fish habitat.

Fish habitat includes the spawning grounds, nursery, rearing, food supply, and migration areas on which fish depend directly or indirectly in order to carry out their life processes.

Figure 9: Requirements for Fish Habitat



Many fish populations in Ontario have suffered significant declines due to habitat degradation caused by human activities. As noted in the Comprehensive Set of Policy Statements, human activities, structures, changes in land use, and alteration to hydrology associated with development can all have an impact on fish and fish habitat. There are a number of ways in which fish habitat can be damaged.

- dredging and filling of near shore spawning and nursery habitat
- loss of natural riparian or lakeshore vegetation
- stream alterations
- poorly managed stormwater runoff
- decreased water quality through an increase in sediment and nutrient loadings and temperature
- loss of groundwater recharge capability

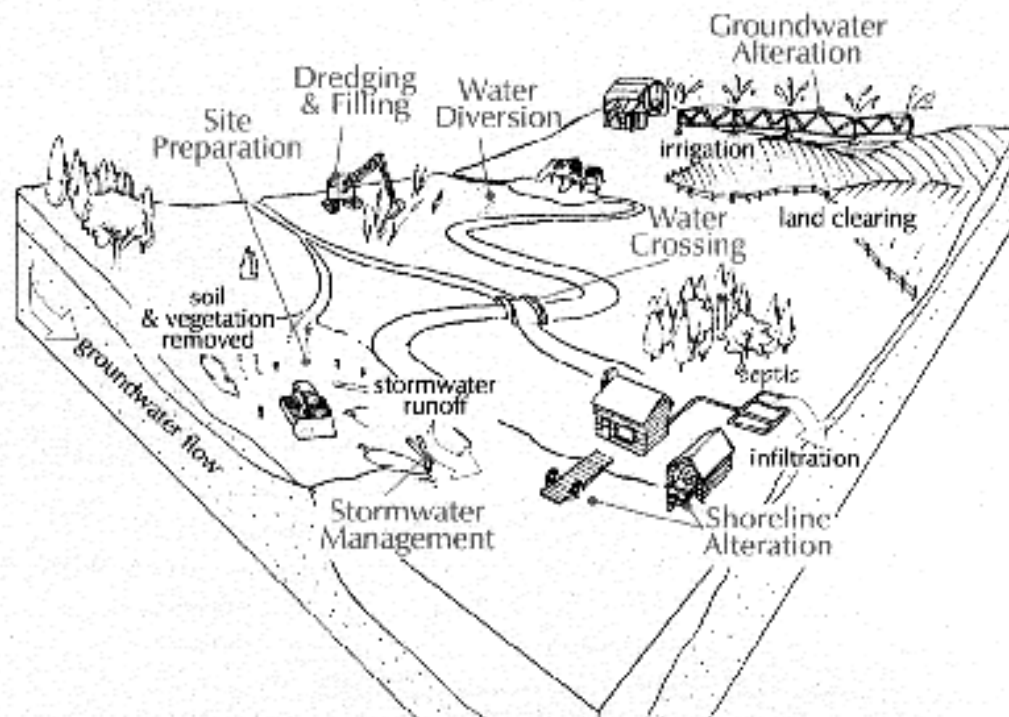
In order to ensure a no net loss of the productive capacity of fish habitat, the federal government has directed efforts at restoring and developing aquatic habitats through the establishment of the Fisheries Act. In keeping with the principles of sustainable development, the objective of this Act is to “increase the natural productive capacity of habitats for the nation’s fisheries resources, to benefit present and future generations of Canadians” (D.F.O., 1986, p.12). In the Province of Ontario, the Ministry of Natural Resources (M.N.R.) assists the Department of Fisheries and Oceans in administering the Fisheries Act.

In addition to legislative measures established to protect, restore and rehabilitate fish habitat, partnerships are being formed to consider fish habitat issues. For example, M.N.R. and O.M.A.F.R.A. are working together to resolve issues related to municipal drains and fish habitat. Another partnership that is occurring in the Nottawasaga Valley Watershed is the Black Ash Creek project. This project is a partnership between many stakeholders including M.N.R., N.V.C.A., M.O.E.E., the Collingwood Remedial Action Plan Public Advisory Committee, Georgian Triangle Anglers Association, Collingwood Collegiate, Naturalists Club, Scouts, and landowners. The purpose of this project is to create fish habitat and reduce sediment loading into Collingwood Harbour through the creation of a stable fish habitat.

ISSUES

- **spring fed and on stream ponds are prominent in the Watershed and their cumulative impact on fish habitat (such as altering watercourse baseflows, water temperatures, increased sedimentation, and barriers to fish movement) are unknown**
- **there is a need to protect the remaining highly productive warm and coldwater fisheries within the Watershed and to rehabilitate degraded fisheries where possible**
- **there needs to be recognition for water quality and quantity, wetland loss, stormwater runoff, nutrient loading, and erosion as they all can affect fish habitat**
- **over time, intensive agriculture and urban/rural development has resulted in a loss of fish habitat in the Watershed**
- **there is concern for source funding for stream rehabilitation programs**
- **people may be unaware that they are destroying fish habitat when undertaking certain activities**
- **there needs to be better integration and coordination between resource management agencies involved in fisheries management in the Watershed**
- **a shoreline management plan for Georgian Bay needs to be prepared.**

Potential Impact on Fish Habitat From Development Activities



Development Activities	Potential Impacts to Fish Habitat					
	Loss of site Specific Habitat	Baseflow Alterations	Increased Temperature	Increased Nutrients & Contaminants	Increased Sedimentation & Turbidity	Barriers to Fish Movement
Site Preparation & Servicing	•	•	➤	➤	➤	•
Stormwater Management	•	➤	➤	➤	➤	➤
Groundwater Management	➤	•	➤	➤	•	•
Dredging & Filling	➤	•	•	➤	➤	•
Shoreline Alterations	➤	•	➤	➤	•	➤
Crossings, Diversions, Ponds and Channelizations	➤	➤	➤	•	➤	➤

➤ Common potential impact • Impact less likely

The diagram above shows where some development activities that affect fish habitat may occur. The accompanying table summarizes the potential impacts from these development activities. Source: Ministry of Natural Resources, Fish Habitat Protection Guidelines for Development (Toronto: Queen's printer for Ontario, 1994), pp. 4-5

OBJECTIVE

To promote the restoration and enhancement of fish habitat.

RECOMMENDATIONS

- watershed municipalities will take a proactive approach to the protection of fish habitat through the incorporation of policies regarding coldwater and warm water fisheries into land use planning documents (official plans and zoning by-laws)
- watershed stakeholders will strive to protect the quality and integrity of ecosystems, including air, water, land, and biota; and, where quality and integrity have been diminished, encourage restoration or remediation to healthy conditions
- efforts will be made to educate and inform residents about fish habitat and how to prevent its destruction
- partnerships between governmental and non-governmental organizations with regard to fish habitat rehabilitation projects and stream rehabilitation projects will continue to be established
- a shoreline management plan will be prepared for Georgian Bay and will be incorporated into conservation authority and M.N.R. programs
- residents will be encouraged through a comprehensive land stewardship program to recognize the value of fish habitat in order to protect and enhance this resource on their lands.

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Wetlands

BACKGROUND

Canadians have had a “love-hate” relationship with wetlands for many years. Those who “love” wetlands see them as a valuable resource with regard to wildlife and aquatic habitat, water quality, flood storage and recreational opportunities. Those who “hate” wetlands may often consider them as a stagnant pool of water and vegetation that attracts undesirable insects such as mosquitos. In recent years, the Province of Ontario has recognized that wetlands are valuable resources which need to be protected and conserved. This resulted in the 1992 release of the Provincial Wetlands Policy Statement (see point of interest on next page).

There are a number of functions of a wetland that make it a valuable resource:

1. Water Quality

Wetlands play a critical role in maintaining water quality by filtering out contaminants in the environment. For example, cattails take up contaminants and break them down partially or completely by delaying their release into the environment. Wetland vegetation is able to absorb toxins thereby removing heavy metals and organic chemicals such as pesticides, and general pollutants. In the Nottawasaga Valley Watershed, wetlands form the headwaters of many watercourses, such as Bear Creek and the Mad River.

2. Water Quantity

Wetlands have a capacity for flood control as they absorb water during peak flows and release it slowly to augment stream levels in dry periods. It is estimated by the Ministry of Natural Resources that wetlands can reduce peak flows associated with intense periods of rainfall by 45 to 70 percent and by 40 percent for snow melt. Furthermore, wetlands assist in groundwater recharge. In the Nottawasaga Valley, the Minesing Swamp is an example of a wetland that has a large capacity for flood storage, which greatly reduces the downstream flooding potential on Wasaga Beach.

3. Erosion Control

By impeding the flow of water during periods of heavy precipitation, wetlands reduce floodwater velocities and significantly diminish downstream erosion.

It is estimated by the Ministry Natural Resources that wetlands can reduce peak flows associated with intense periods of rainfall by 45 to 70 percent and by 40 percent for snow melt

4. Ecological Functions

Wetlands are characterized by a diversity of plant and animal life. This is emphasized by the fact that twelve of the fourteen species identified as endangered within Ontario require wetland habitat (Soil Conservation Society of America, 1987). Certain fish, reptiles, mammals, birds, and waterfowl are dependent on wetlands for their entire life cycles. In addition, other fauna such as deer and amphibians use the wetland environment to ensure their survival at critical stages of development. There are a number of wetlands in the Nottawasaga Valley Watershed that provide critical ecological functions. For example, the Silver Creek Wetland contains Canada's most northerly colony of white egrets.

5. Recreation

Wetlands provide an opportunity for fishing, hunting, canoeing, bird watching, and photography. In fact, it is estimated that the direct tourism benefit from wetlands in Ontario in 1980 totaled \$853.3 million (Soil Conservation Society of America, 1987). In the Nottawasaga Valley, the Osprey Swamp and Minesing Swamp provide significant recreational opportunities, especially hunting and canoeing, for watershed residents and visitors.

The Wetlands Policy

In 1992, the Wetlands Policy Statement was issued under the authority of Section 3 of the Planning Act, R.S.O. 1990. This policy statement was established to ensure that public planning agencies would have regard for the value of wetlands. In general, the intent of the Wetlands Policy is to:

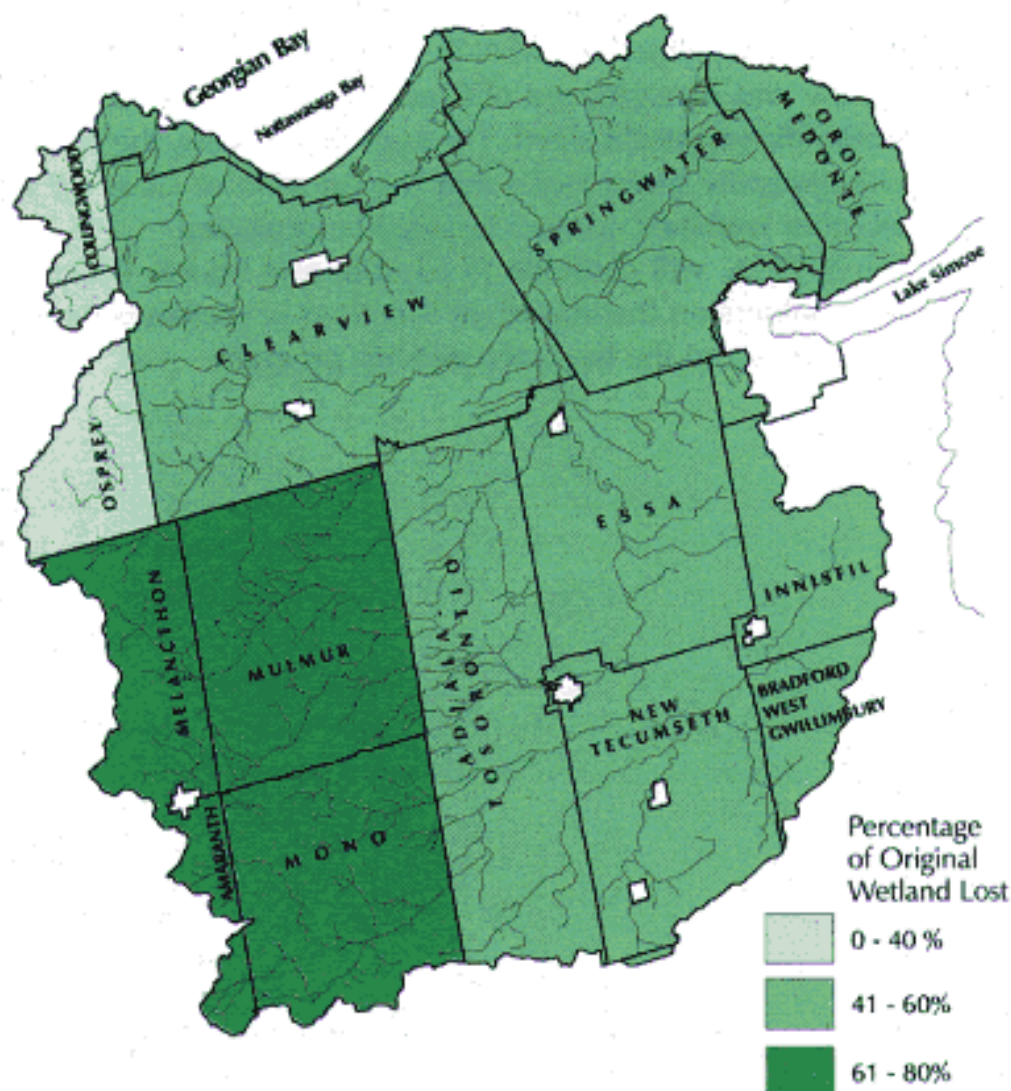
- protect Provincially Significant Wetlands (Classes 1 to 3) and encourage the protection of all other wetlands.
- to regulate development within adjacent lands (120 metres) of a Provincially Significant Wetland, subject to the preparation of an environmental impact study that demonstrates development will not impact the functions of the wetland area
- to ensure that all planning jurisdictions incorporate policies and protect Provincially Significant Wetlands in official plans, zoning by-laws and other development decision under the Planning Act.

The Ministry of Natural Resources is the lead agency for administering this Policy (which is now included in the Comprehensive Set of Policy Statements) and the Conservation Authority of Ontario assist in the implementation. In the Nottawasaga Valley, the Conservation Authority has been actively encouraging the Conservation of Class 1 to 7 wetlands and wetlands not yet classified

ISSUES

The constant of wetlands and their destruction is a pressing issue. In Southern Ontario, approximately 75 percent of original wetlands have been lost. As illustrated in Figure 10, significant losses have occurred in

Figure 10: Wetland Loss in the Nottawasaga Valley Since the Beginning of Settlement.



Source: Ministry of Natural Resources, *Provincially and Regionally Significant Wetlands in Southern Ontario*, (Toronto: Queen's Printer for Ontario, 1987), p. 4.

the south western portion of the Nottawasaga Valley Watershed. This destruction has the following implications on wetland functions in the Watershed:

- the natural process of maintaining water quality is reduces
- flood storage capacities are reduced
- downstream erosion increases
- ecological functions, such as wildlife habitat, are reduced
- recreational opportunities are reduced.

OBJECTIVE

To preserve wetlands of provincial significance and conserve all other wetlands in the Watershed.

RECOMMENDATIONS

- the N.V.C.A. will continue to support Provincial Policy in the protection of Class 1-3 wetlands
- the N.V.C.A. will formulate a wetlands policy in cooperation with municipalities and M.N.R. to develop procedures for the
- review and management of Class 4-7 wetlands and all other wetlands not yet classified. Through this process, the N.V.C.A. will generally recommend that the function of Class 4-7 and all other wetlands not yet classified be protected
- the N.V.C.A. will continue to educate and inform watershed stakeholders on the important functions of wetlands through fact sheets and the land stewardship program

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Shoreline Management

BACKGROUND

One of the most significant resource features of the Nottawasaga Valley Watershed is the shoreline of Georgian Bay (Nottawasaga Bay). This shoreline, which extends from Sturgeon Creek to the east and the Town of Collingwood to the west, includes Wasaga Beach: the world's largest freshwater beach. Overall, for watershed residents, inhabitants, and visitors, the Georgian Bay shoreline is:

- a permanent or seasonal residence
- a recreational playground
- a place of work or income
- a significant area for fish and wildlife habitat

The shoreline environment of Nottawasaga Bay is a fragile resource and given that it is just over an hour drive from Metropolitan Toronto, it is under considerable pressure from various land use demands. In areas that are susceptible to flooding, erosion, and environmental degradation, the effects of this increasing pressure can lead to property damage, danger to public safety, and detrimental impacts on the shoreline ecosystem.

The Collingwood Harbour is an example of Nottawasaga Bay shoreline that has experienced severe environmental degradation. The harbour, which was used intensively for ship building, was often used as a disposal area for paint products (paint and cans) and other ship building materials.. These ship building activities, along with high phosphorus loadings from the local sewage treatment plant, led to the pollution and contamination of Collingwood Harbour. This degradation was so severe that in 1977, the harbour was identified by the federal and provincial governments as one of 43 areas of concern in North America. Since 1977, the Collingwood Harbour Remedial Action Plan was worked towards remediating and restoring the environment of the harbour. In fact, this remediation and restoration has resulted in the 1994 "delisting" of the Collingwood Harbour as an area of concern (see Collingwood Harbour Remedial Action Plan Point of Interest below for further detail).

ISSUES

- various competing land uses along the shore of Nottawasaga Bay and past and present uses have resulted in the following:
 - dense septic system based on development along the shoreline, especially in Wasaga Beach, has contaminated the environment because:
 - many systems are over capacity - especially when dwellings that were intended for seasonal use are being used for permanent use
 - the high water table in the area has interfered with the operation of the septic system
 - significant sand dunes located along the shoreline are being lost to development and this decreases the dune's capacity for protecting inland areas from erosion and flood damage.
 - public access along the shoreline is becoming more restricted in some areas
 - intensive recreational activities, such as boating have an impact on water quality and shoreline erosion
 - at times, the beach has high bacteria counts that result from various land use activities occurring adjacent to, and upstream on the Nottawasaga River and this has health implications for beach users
 - in some areas, development has occurred in unsuitable areas of the shore which has resulted in increasing economic losses due to erosion and flood damages (Wasaga Beach), localized pollution problems (Collingwood Harbour), the degradation of environmentally sensitive areas (Collingwood Harbour - Cranberry Marsh and Collingwood Harbour Marsh)
- Ice jamming in the spring at Wasaga Beach can cause extensive property damage
- the extent of shoreline erosion for Nottawasaga Bay is unknown
- a shoreline management plan for Nottawasaga Bay has not been prepared to date

Collingwood Harbour Remedial Action Plan

Under the Great Lakes Water Quality Agreement and the Canada- Ontario Agreement Respecting Great Lakes Water Quality, the Federal Government and the Province of Ontario have been developing Remedial Action Plans to restore impaired aquatic ecosystems. There are 43 Areas of Concern in North America along the Great Lakes, and 17 of these are located in Canada. In particular, Collingwood Harbour was identified as an Area of Concern in 1977.

Since 1977, the Collingwood Harbour Remedial Action Plan (RAP) has been working towards ways of addressing and alleviating the harbour's environmental problems. Some of the environmental problems in the harbour include algal growth caused by excessive phosphorus loadings from the Collingwood sewage treatment plant; lead, copper, and zinc contaminated sediment from metal based paint used in Canada Steamship Lines (CSL) shipyards; and the impairment of shoreline habitat from development in the early 1900's. The RAP has taken an ecosystem approach to restoring the harbour environment by considering all activities within the watershed that have contributed to the health of all organisms supported by the harbour. The RAP process, which prides itself on providing opportunities for the community

to get involved with technical experts to resolve the harbour's environmental problems, has many accomplishments to date. Some of these accomplishments include:

- the optimization of phosphorus removal at the sewage treatment plant by testing innovative technologies
- the expansion of residential, industrial, and commercial water conservation programs
- fish and wildlife habitat rehabilitation for Black Ash Creek and Collingwood Harbour
- sediment removal from the CSL water lots and the east harbour - the sediment can now support viable biological communities
- the establishment of the Environmental Network to assist in the delivery of RAP programs and emerging environmental initiatives
- an extensive public outreach and pollution program that includes the Greening of Collingwood initiative and Enviropark.

The most significant accomplishment of the Collingwood RAP is that the area is the first of the 43 North American Areas of Concern to be 'delisted'. This delisting means that the area has been cleaned up and the beneficial uses of the harbour have been restored. The people of Collingwood and the RAP program are applauded for this noble achievement.



Georgian Bay
(Nottawasaga Bay)
shoreline in the Town
of Collingwood

OBJECTIVE

To manage the Nottawasaga Bay shoreline in a manner that:

- minimizes property damage and loss of life from flooding erosion, and other associated shoreline hazards
- conserves, preserves, remediates, and enhances the environmental features and functions of environmentally sensitive and significant areas
- encourages public and private participation in Management

RECOMMENDATIONS

- a shoreline management plan will be prepared in accordance with Great Lakes Shoreline Management Guide and it shall include components such as:
 - flooding and erosion conditions
 - the recreational potential of the shore area
 - an environmental survey
 - suitable MNR land uses.
- the N.V.C.A. and directly affected municipalities will be responsible for the implementation of the shoreline management plan

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Water Resources

BACKGROUND

Water resources in the Nottawasaga Valley Watershed exist in the form of surface water and groundwater. Surface water in the Nottawasaga Valley is found in the form of rivers, lakes, and snow pack. As the surface waters of the watershed are put to many uses, they must meet specific water quality and quantity requirements. The Ministry of Environment and Energy notes that “water quality must be managed, preserved, and restored where necessary to permit the greatest number of uses, based on the best interests of the people of Ontario”. (M.O.E. 1984). Furthermore, as water quality management is directly related to surface water (and groundwater) quantity it is important to manage water quantity to ensure a fair sharing of the available water supply in order to protect both withdrawal and in-place uses of water.

For the past few decades, the Ministry of Environment and Energy (M.O.E.E.) has been monitoring water quality and quantity in the Nottawasaga Valley Watershed. A Nottawasaga River water quality report, prepared by the M.O.E.E. and based on 13 long term monitoring sites, indicates that water quality in the Watershed is generally good. In particular, an executive summary of this report identifies the following observations or trends for water quality and quantity:

“Water quality must be managed, preserved , and restored where necessary to permit the greatest number of uses, based on the best interests of the people of Ontario” (M.O.E., 1984)

- the best water quality occurs in the Mad and Pine Rivers above Canadian Forces Base Borden
- localized water quality impacts were observed on the Boyne River near Shelburne, the Pine River below Canadian Forces Base Borden, Lamont Creek near Stayner, and Beeton Creek - these impacts can be attributed to discharge from sewage treatment plants
- phosphorus levels, except for Beeton Creek, have declined over the years, however some sites still show concentrations that frequently exceed the M.O.E.E. guidelines
- nitrate and chloride levels show an upward trend with significant increases in chloride since the mid-1980's - although observed levels may not be significant at this time
- given their stream flows, the Boyne River, the Pine River and Willow Creek have the highest potential for diluting and assimilating pollution and the Nottawasaga River, the Mad River, and Beeton Creek have the lowest potential for diluting assimilating pollution.

In addition, the Nottawasaga River is identified by the Ministry of Environment and Energy as a Policy 2 River with regard to phosphorus (i.e. it exceeds phosphorus load capacity and no new phosphorus loads should occur). It was also identified by the Rural Beaches program for the Nottawasaga Valley that the Matheson, Mad, and McIntyre subwatersheds were consistently major contributors of bacterial pollution in the Nottawasaga drainage basin (N.V.C.A., 1993, p.28)

Groundwater is an essential and vital resource for over 80 percent of watershed residents who use it as their sole source of water for drinking washing, farming, manufacturing, and daily water needs. As groundwater is less visible, it has typically received less public attention with regard to water quality and quantity than surface water. However, in recent years a number of events, such as leaking gas tanks, landfill selection, large areas of contaminated groundwater, and the Hagersville tire fire, have led to an increase in public awareness regarding groundwater issues. Increased awareness has also resulted from interference with groundwater supplies, discussions of water pipelines and exports, and recent attention to the issues of "mining" aquifers

Groundwater exists almost anywhere underground. It is found in the space between particles of rock and soil, or in crevices and cracks in rocks. The majority of groundwater is within 100 metres of the surface because as depth increases, the increased weight of the overburden causes the openings of the rock to become smaller. To understand the dynamics of groundwater, one must consider the subsurface geology as groundwater storage and motion is largely controlled by the distribution of highly permeable materials such as sand and gravel which act as aquifers and nearly impermeable aquitard materials such as clays and silts. Consideration should also be given to the role of groundwater in the hydrologic cycle. The hydrologic cycle is a series of transformations that occur in the circulation of water from the atmosphere onto the surface and into the subsurface regions of the earth, and then back from the surface to the

Groundwater is an essential and vital resource for over 80 percent of watershed residents who use it as their sole source of water for drinking, washing, farming, manufacturing, and daily water needs.

atmosphere. The functions of this cycle are illustrated in Figure 1.

Groundwater Protection

The importance of protecting natural groundwater systems is made evident by the three following points:

1. domestic water consumption doubled from 1966 to 1985 and is expected to double again by the year 2000
2. the groundwater system is critical for: flood control, as it acts as a huge reservoir that absorbs and slowly releases water from heavy rainfalls; and maintaining wetlands
3. the health of groundwater systems significantly affects the health of surface waters as more than 30 percent of total stream flow originates as groundwater - this increases to nearly 100 percent in dry periods

The amount of time water spends in the groundwater system portion of the hydrologic cycle varies enormously. Water may spend as little as days or weeks underground or it may spend as much as 10,000 years. Given that water can spend up to 10,000 years in the ground, the potential for contamination is a serious issue.

Headwater regions are particularly susceptible to contamination as they are recharge areas for regional aquifer systems. Many headwater areas lie in glacial terrain where surface materials are frequently permeable and the elevation is relatively high. Therefore, contaminants are able to rapidly infiltrate into the aquifer.

*Note: The majority of wells tested were located in areas of intense agriculture, with common soils, and common land use practices.

In the Nottawasaga Valley, development pressures exist in headwater areas. As noted at the Headwaters 1 conference in October 1991, headwater regions are attractive for residential development and this brings septic systems, landfills, and gas stations (There's Always Someone Downstream, 1991, p.8). In addition, as development increases, so does the amount of area covered with pavement. This has implications for impervious areas, where the recharge zone of the headwater region is not able to function, as runoff is removed quickly and the natural infiltration process is restricted or eliminated.

Given the general lack of knowledge about how groundwater operates, the overall extent of groundwater contamination in the Nottawasaga Valley is unknown. However, the Ontario Farm Groundwater Quality Survey (summer 1992) indicates the following, based on a study of approximately 1300 domestic

farm wells in Ontario* (approximately 4% of these wells are in the Nottawasaga Valley Watershed):

- 43% of all wells tested contained one or more of the target contaminants (nitrate-N, total faecal coliform bacteria, and several common herbicides) at concentrations above the provincial drinking water standards
- 36% of wells exceeded the previous maximum acceptable concentration for at least one of the coliform bacteria selected for analysis
- 25% had faecal coliform bacteria
- 15% exceeded the Ontario maximum acceptable concentration for nitrate.

Overall, these findings indicate that further investigations into groundwater contamination may be beneficial for watershed residents and municipalities

ISSUES

Potential Sources of Groundwater Contamination

The following are some examples of point and non-point sources of contamination that can cause groundwater contamination. Point Sources

- on-site septic systems
- leaky tanks or pipelines containing petroleum products
- leaks or spills of industrial chemicals at manufacturing facilities
- underground injection wells (industrial waste)
- landfills
- livestock wastes
- leaky sewer lines
- spreading of sewage sludge on land
- graveyards
- road salt storage

- development pressures are occurring at headwater areas, which are source areas for watershed rivers and streams
- further work is needed to reduce phosphorus levels in surface waters that frequently exceed M.O.E.E. Guidelines
- while observed levels for nitrate and chloride may not be significant at this time, the fact that increasing trends are occurring for these compounds may be an indication of non- point source contributions from increasing and/or changing land use activity taking place within the watershed. Without proper management, the runoff resulting from significant changes in land use can have detrimental impacts on the receiving stream environment.
- watercourse assimilation capacities for sewage treatment plants are considered at a local or municipal level, not on a watershed basis
- sewage treatment plants do not always perform as designed, and in some instances they are not designed for maximum treatment
- nutrient enrichment from land use practices has impacts on aquatic habitat and the natural functions of waterbodies
- there are inadequate water quality and quantity monitoring programs within the Watershed due to fiscal constraints
- the water quality sampling program in the Nottawasaga Valley must be maintained to assess the long term health of the Nottawasaga Valley Watershed
- in urban areas a significant problem is the occasional dumping of toxins and pollutants into storm sewers and these pollutants usually end up in downstream waterbodies of recreational and/ or natural heritage importance

areas
- salt runoff and other chemicals from roads and highways

Non-Point Sources

- fertilizers and pesticides used on lands and forests
- contaminants in rain, snow, and dry atmospheric fallout

Source: Adapted from Environment Canada, 1993, p.9

- water quantity is difficult to regulate because the total amount of surface water and groundwater being removed (with or without a permit) from areas across the Watershed is unknown
- water taking is significant in several areas within the Watershed and compliance with the conditions of water taking permits needs to be improved (i.e. water budgets or aquifer impacts should be determined) to ensure water quality and quantity is not jeopardized
- surface water and groundwater are taken “free of charge” by permit, and hence no true values are placed on these extremely valuable resources
- information on groundwater resources and areas of concern needs to be compiled so that efforts can be made to protect sensitive and significant areas

The following are objectives for surface water and groundwater in the Nottawasaga Valley:

“Groundwater is just as important as the sparkling lakes and rivers of our postcard image of Canada. This national treasure may ‘hidden’ but it must not be forgotten.

(Environment Canada, 1993, p.11)

- to promote a better understanding of the dynamics of groundwater
- to protect the quality of groundwater resources and ensure the fair sharing and conservation of groundwater in the Nottawasaga Valley Watershed
- to protect the quality of surface water resources in order to fulfill Provincial Water Quality Objectives
- to ensure a fair sharing of the available groundwater and surface water supply in order to protect water quality, aquatic ecosystems, and human health.

RECOMMENDATIONS

Short-term

- resource management agencies and municipalities will strive to identify, protect (through existing policies and legislation) and regulate (where applicable) the following features in the watershed:
 - all headwater areas
 - significant recharge and discharge zones
 - major aquifers
 - contaminated wells and aquifers
 - natural features that depend on water.
- Provincial Water Quality Objectives and Provincial Quality Guidelines will be used for guidance in making decision on health, viability, and sustainability of waters so that water quality is not degraded
- an action plan will be developed for collecting the appropriate data required to determine the quality and quantity of surface water and groundwater resources, and sources of contamination
- to help coordinate the fair and equitable allocation of water resources on a watershed basis. This will include issues such as water taking, drainage,

stormwater, and assimilation capacities

- **through Provincial Policy, resource management agencies and municipalities will ensure that:**
 - **development may be permitted only if the quantity and quality of groundwater and surface water are protected**
 - **development that will negatively impact groundwater recharge and discharge areas, headwater, aquifers, wetlands, and streams and rivers which have been identified as sensitive areas will be not be permitted.**
- **effective pollution control measures for sewage treatment plants and industries must be employed to minimize the degradation of stream quality**
- **water resource management agencies will continue to investigate methods of reducing phosphates, chlorides, nitrates, bacteria, and other contaminants from point and non-point sources so that water quality can meet M.O.E.E. standards**
- **the Nottawasaga River, Mad River, and Beeton Creek (under imposed requirements of wasteload allocations) will be examined critically and managed efficiently when considering assimilation capacity**
- **when considering assimilation capacities for future development, upper and lower tier municipalities will be encouraged to have regard for the potential impacts on water resources for downstream municipalities**
- **for point sources the following is recommended:**
 - **to encourage efficiency at sewage treatment plants in the watershed - i.e. upgrades or new plants if feasible.**
 - **the N.V.C.A. will assist municipalities to collect water quality data required for assimilation studies for sewage treatment performance audits**
 - **to prevent the release of discharge from point sources into sensitive areas.**
- **for non-point sources the following is recommended**
 - **resource management agencies and municipalities will promote and endorse the CURB and Environmental Farm Plan Programs in the Watershed**
 - **resource management agencies and municipalities shall encourage Best Management Practices for agriculture**
 - **resource management agencies will continue to inform and educate urban and rural residents about reducing non-point sources**
 - **resource management agencies and municipalities will endorse Best Management Practices for Stormwater Management**

Long Term

- **water quality modeling/monitoring for the Nottawasaga Valley will be carried out to identify long term water quality levels and conservation measures**
- **the cumulative impact of water taking on surface and groundwater resources in the Nottawasaga Valley Watershed shall be determined**
- **the N.V.C.A. in conjunction with watershed stakeholders will identify potential problems and viable solution for water quality and quantity through subwatershed studies**
- **resource management agencies will continue to strive for all watercourses in the Nottawasaga Valley Watershed to meet Provincial Water Quality Objectives**

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The Goal of the Watershed Plan is the conservation of natural resources within our watershed in a cooperative, integrated manner in which human needs are met in balance with the need to sustain the natural environment.

Septic Systems, Septage, and Sewage Treatment

BACKGROUND

“The system is simple and that’s one of its worst enemies - it’s out of sight and out of mind.”

Source: Solway, J., and the Township of Mono, 1993, p.16

There are approximately 1.25 million septic systems in Ontario that treat wastewater on properties not serviced by a municipal sewage system. On proper soil, and where dwellings are spaced sufficiently apart, well designed septic systems can operate reliably for years. In fact, when working properly, the removal of pathogens (viruses and parasites) is at least equal to that of advanced treatment plants with secondary and tertiary treatment. Figure 11 demonstrates how a properly designed domestic septic system works. Notwithstanding, the septic systems can fail and the impacts of contamination can be serious.

Approximately 50 to 75 percent of families in the Watershed are on private septic systems, and draw their water from nearby wells. If any of these septic systems fail, contamination will occur and it may move offsite, thus threatening the well next door. In addition, when septic systems are placed too close together for soil conditions to accommodate, the problems become cumulative, threatening whole communities, aquifers, watersheds and ecosystems. Given the dynamics of the hydrologic cycle, contamination is not likely to stay localized and ultimately, it can destroy the ecosystem upon which we depend.

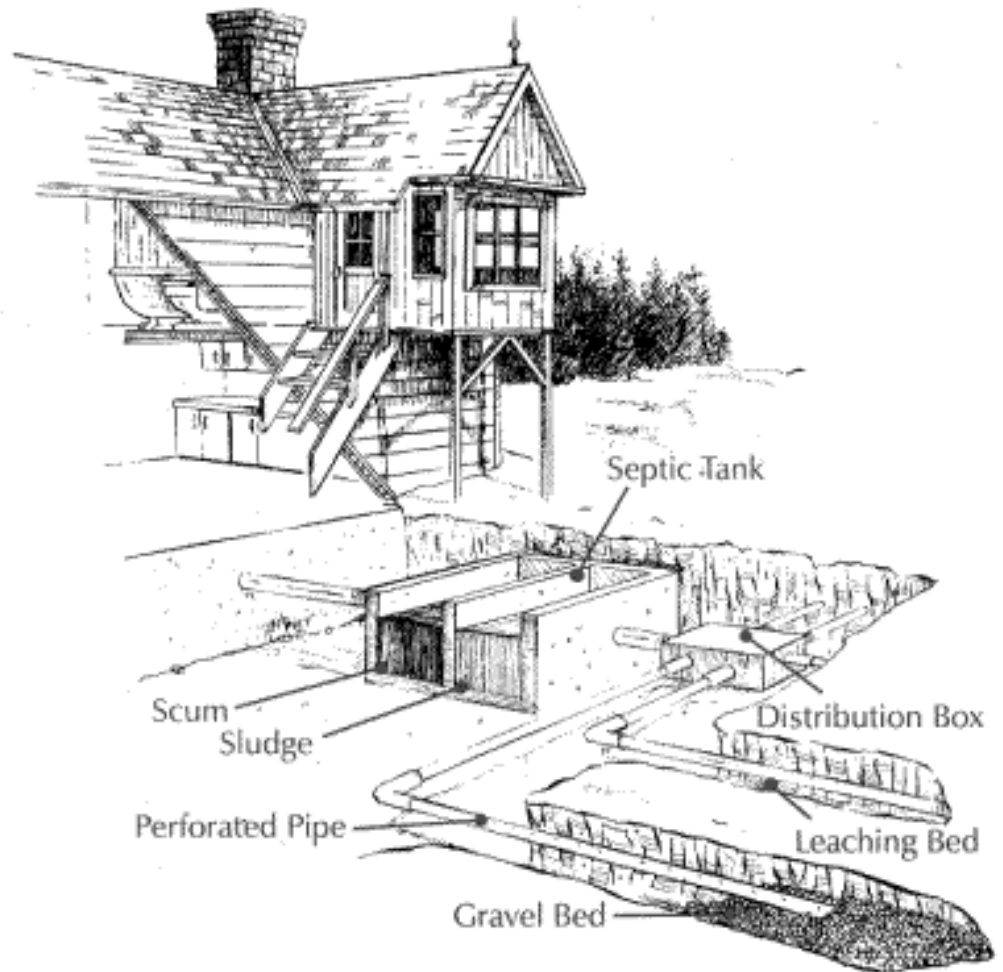
Problems with septic systems often stem from improper use, which is often a result of lack of awareness by the homeowner. In fact, many people know very little about the proper use and maintenance of their septic systems, and some are not even aware that they have a septic. Brian Cooper, a M.O.E.E. sewage engineer notes that “the system is simple and that’s one of its worst enemies - it’s out of sight and out of mind (Solway J., and the Township of Mono, 1993, p.16)

Another issue related to septic systems is the disposal of materials pumped out of the septic tanks (septage). Presently, most septage is spread under permit on agricultural land. However there are potential problems with this practice because improper spreading, such as spreading on frozen ground, can cause contamination of adjacent watercourses and groundwater through surface

runoff. In some municipalities, there is not enough winter storage capacity for septage and it is difficult to get permits for storage capacity. The best solution for this problem appears to be the reprocessing of septage by municipal treatment plants. Yet, many treatment plants are already at capacity and this solution can only be made possible as plants expand or as new plants are built.

In urban areas, where domestic, commercial and industrial waste is treated by communal systems, residents enjoy a “maintenance free” system of waste disposal. However, urban landowners and industries still must use caution when disposing of materials as there is a possibility of failure at the sewage treatment plants.

Figure 11: Septic System Operation



- waste water from toilets, bathtubs, sinks, floor drains etc. goes into the septic tank and over time gravity separates the wastes into 3 layers:
 - 1. Heavy materials - which settle to the bottom are broken down by naturally occurring anaerobic bacteria.
 - 2. Lighter soaps, greases, etc. - which rise to the top as thick scum
 - 3. Liquids with suspended solids.
- when waste water comes again from the house into the first chamber, an equal amount of liquid is pushed from that chamber into the second one - which forces the same amount out of the second chamber into the distributing pipes
- waste water travels through the distribution pipes and drips through holes into the filtering materials of the leaching bed
- once in the filtering materials, the liquid goes into voids of the stone layer and is broken down by oxygen using bacteria or it is filtered through the layer of sandy soil
- water moving upward through the soil filter gets taken up by grass roots.

Source: Ontario New Home Warranty Program, a Builders Guide to Septic Systems (North York: Ontario new Home Warranty program, 1994), p.5

ISSUES

- there is a lack of data on the cumulative impacts from the spreading of septage and sewage on agricultural fields (i.e. what are the potential impacts on groundwater and surface water related to site specific disposal areas)
- sewage treatment plants do not always perform as designed and in periods of high rainfall, there is a potential for raw sewage to be released into receiving lakes and rivers and this can have health implications for watershed inhabitants and ecosystems
- watercourse assimilation capacities for sewage treatment plants are considered at a municipal level, not a watershed level and this may have implications for downstream users
- the treatment systems at sewage treatment plants do not remove heavy metals from sewage and this has implications for the contamination of receiving lakes and rivers
- the number of malfunctioning or abandoned septic systems in the Nottawasaga Valley is unknown
- the information/education needs for septic systems and septage and sewage spreading are significant
- there is sometimes a lack of communication between M.O.E.E./ District Health Units and watershed municipalities and their residents regarding the spreading of septage. Some municipalities have received complaints about spreading from nearby residents and they did not have any information regarding the spreading (eg. location, hauler, permit holder, etc.)

OBJECTIVE

To ensure the operation of private septic systems and communal sewage systems including the deposition of the waste products, in an environmentally sound economically manner.

RECOMMENDATIONS

To accomplish the above noted objective, three major areas need to be effectively addressed: user control; data collection and sound science; and information/education

User Control

- additional needs and requirements for enforcement and compliance of septage and sewage spreading will be determined
- the upgrading of sewage treatment plants will be encouraged for plants at capacity or approaching capacity
- upper and lower tier municipalities will be encouraged to work with the M.O.E.E. and N.V.C.A. to determine watercourse assimilation capacities on a watershed basis

Data Collection

- The District Health Units, the M.O.E.E. and the N.V.C.A. will determine the possibility of collecting information regarding
 - contamination and septage and sewage spreading
 - the location of septage and sewage spreading
 - the number of failing septic systems in the Watershed.

Education

- resource management agencies and organizations will actively communicate with the public so that the value of septage and sewage as an important nutrient source for agricultural lands can be recognized
- the N.V.C.A. will add the topic of septic system operation and the values of sewage and septage as an important nutrient source to the Environmental Information/Education program
- information needs will be coordinated through a land stewardship program
- a joint information pamphlet between the N.V.C.A. and the District Health Unit, the Ministry of Environment and Energy, and the Ontario Ministry of Agriculture, Food and Rural Affairs on septic systems and municipal storm drains

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Watershed Management Plan

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Stormwater Management

BACKGROUND

The conversion of natural landscapes to urban landscapes, and the associated increases in impervious areas (roads, streets, parking lots, and roof tops) usually increases the volume of stormwater runoff and the runoff rate for a given rainfall event. The stormwater collection systems of the past had a single purpose: to convey storm runoff away from a site and into the receiving body (stream or lake) as quickly as possible. Today, stormwater management systems serve multiple functions, providing surface drainage, flood control, erosion and sediment control, groundwater recharge, and reducing pollutants in runoff. Overall, an effective stormwater management system is a thorough inventory of natural and man-made features that will influence the rainfall-runoff process.

ISSUES

- non-urbanized flood plains need to be identified and retained in a condition that minimizes interference with flood water conveyance, flood water storage, and ground/surface water interface
- there is an increased potential for land-based pollutants to enter into surface waters due to urbanization
- wetlands, environmentally significant areas, areas of natural and scientific interest, and locally significant areas need to be protected from polluted stormwater runoff
- the detrimental effects of stormwater runoff, such as soil erosion and sedimentation problems caused by stormwater runoff need to be minimized
- fish habitat must be protected from the detrimental effects of stormwater runoff
- there is a need to improve upon the design and maintenance of stormwater management facilities through an evaluation of past stormwater management practices
- municipalities, landowners, and developers need to be further informed on how to manage urban streams by looking for and understanding basic biological and fluvio-geomorphological characteristics that maintain the health of the system
- there is a need to maintain the quantity and quality of natural precipitation recharge to groundwater.

OBJECTIVE

To ensure that stormwater management does not negatively impact the quality and quantity of groundwater and surface water

RECOMMENDATIONS

- the N.V.C.A. will encourage municipalities and consultants to move away from past applications of “hard Engineering” such as concrete channelization of watercourses to “naturalization” techniques such as bioengineering, and natural channel design
- resource management agencies will have regard for the quality and quantity of stormwater runoff, and linkages between surface runoff, surface water and groundwater * the N.V.C.A. will base its review of stormwater management facilities on the most currently accepted Provincial Guidelines
- the N.V.C.A. will provide information and education to municipalities, landowners, and developers to raise awareness on biological and fluvio-geomorphological characteristics of natural channel systems as well as the principles of stream management in an urban setting
- residents will continue to be informed about where municipal drains end up and the implications of pouring chemicals, etc. down the drain

Stormwater management is the set of actions taken to control water in its hydrologic cycle with the objectives of providing surface drainage, flood control, erosion and sediment control, groundwater recharge, and reducing pollutants in runoff.



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Flooding

BACKGROUND

Since the occurrence of Hurricane Hazel, the Province of Ontario has taken measures to improve flood warning and to minimize the amount of new development in the flood plain.

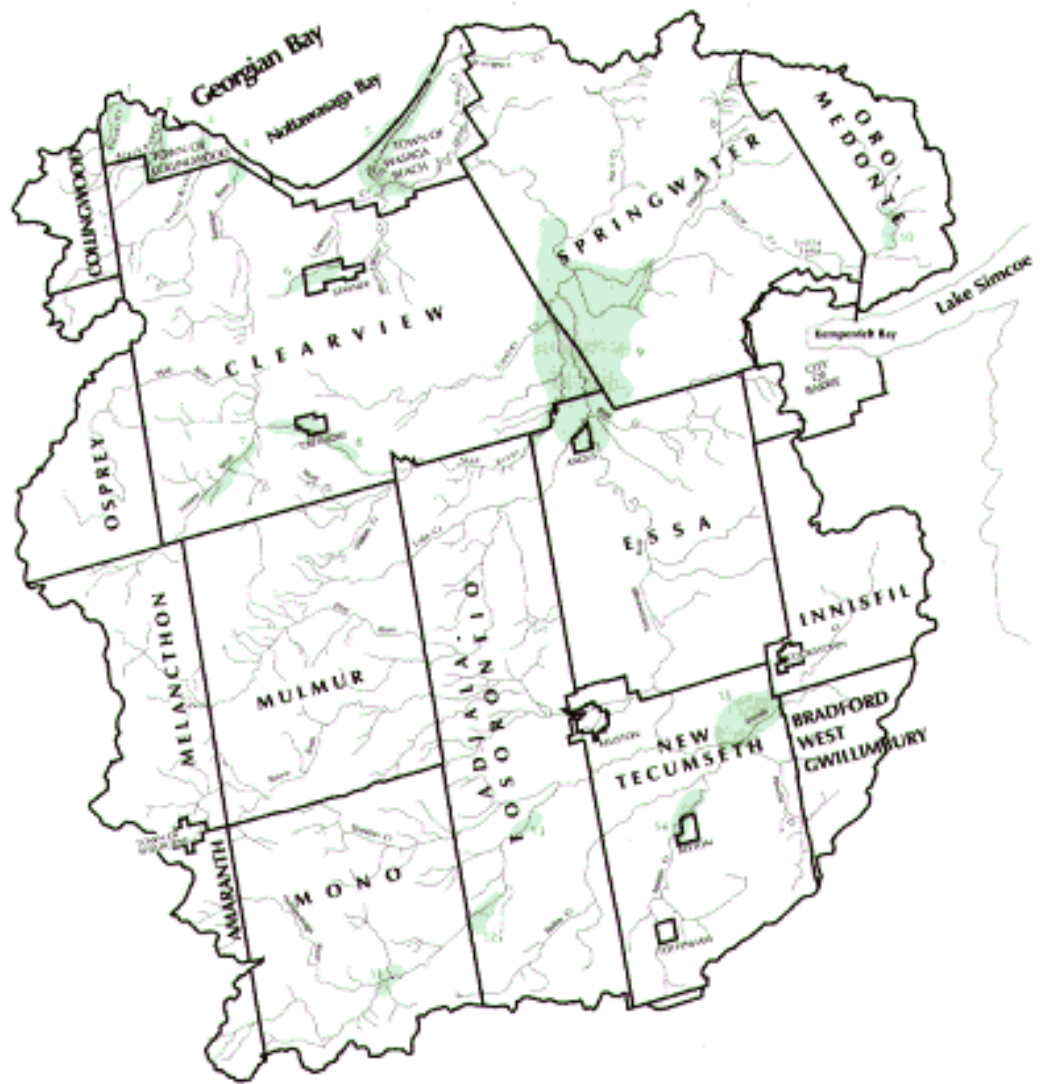
At some time, all regions of Ontario have experienced severe flooding. Flooding is a natural event that has a number of causes.

- spring flooding due to snow melt, rain, or ice jams
- rain storms that occur in the summer or fall
- flash floods at the end of winter due to ice jams and heavy rain
- human induced flooding, through watershed alteration and land use changes.

Generally, the probability of flooding can be recognized through historical experience. By studying stream flow records over a number of years, the probability of high flow rates can be estimated. The lands that are most likely to experience overflow or flooding are low lying lands (flood plain) adjacent to streams, rivers, wetlands, and lakes. Since the occurrence of Hurricane Hazel, the Province of Ontario has taken measures to improve flood warning and to minimize the amount of new development in the flood plain. These measures have been accomplished by two methods; flood forecasting programs, and flood plain management policies.

Flood forecasting in Ontario is undertaken by Conservation Authorities and the Ministry of Natural Resources (where no C.A.'s exist). Through flood forecasting, residents can be warned about the probability of impending floods. This warning assists residents in preparing for flood events and promotes safety. There are 15 flood prone areas in the Nottawasaga Valley Watershed (see Figure 12) that the Conservation Authority monitors in time of potential flooding. In 1988, the Province of Ontario issued the Flood Plain Planning Policy Statement, pursuant to the provisions of the Planning Act. This Policy Statement which is now incorporated into the Natural Heritage Environmental Protection and Natural Hazard Policies prohibits incompatible development in the flood plain of streams, rivers, and lakes. In doing so, lives and personal property can be protected from flooding events.

Figure 12 Flood Prone Areas in the Nottawasaga Valley Watershed



1. Collingwood - Silver Creek
2. Collingwood - Black Ash Creek
3. Collingwood - Pretty River
4. Clearview Township - Batteaux Creek
5. Wasaga Beach - Nottawasaga River
6. Stayner - Lamont Creek
7. Dunedin (Clearview Twp) - Noisy River
8. Creemore - Mad River
9. Angus - Minesing Swamp, Nottawasaga River
10. Oro - Medonte Twp (Hwy 11) - Willow Creek
11. Glen Cross (Mono Twp) - Nottawasaga River
12. Hockley (Mono and Adair Twp) - Nottawasaga River
13. Adair Township (Cottage Road) - Nottawasaga River
14. Beeton - Beeton Creek
15. Township of New Tecumseth - Innisfil Creek

ISSUES

- there is a need for more technical stream and river flow data
- most flood plain mapping for the Nottawasaga Valley Watershed is outdated and the cost to produce new mapping is high
- there is a continuous need to educate and inform the public, especially those living in or near the flood plain areas, about the dangers of flooding. In addition, they need to be informed about the issue of flooding so that they understand that policies implemented through the Natural Heritage, Environmental Protection and Hazard Policies (Policy Statement A3.5: Riverine Flood Plains) and N.V.C.A. Regulations have been developed to protect the public from the dangers of flooding.
- agencies need to be integrated with regard to flood warning and response programs.

OBJECTIVE

To develop programs that will ensure the protection of public health and safety from flooding and flood events



Flooding on the Mad River in Avening (near Creemore)

RECOMMENDATIONS

- the N.V.C.A. will revise its flood forecasting system to be more comprehensive and to include the following:
 - an updated Flood Forecasting Warning System Information Booklet which will be circulated to all municipalities and the MNR
 - assistance to municipalities that are developing their flood contingency plan (as part of their emergency response plan)
 - new stream gauges will be purchased to complete the N.V.C.A.'s flood forecasting system on a watershed basis.
- the N.V.C.A. will initiate flood line mapping projects in high risk flooding areas
- the N.V.C.A. will initiate pre-development consultation meetings for development proposals that involve flooding concerns
- the N.V.C.A. will encourage municipalities to incorporate flood plain management principles into official plans and zoning by-laws
- restructure the N.V.C.A.'s communications strategy for educating the public (both present and future decision makers) on flooding issues so that the public understands the severity of flooding and the reason for flood plain policies - this will include:
 - the preparation of an information booklet on flooding issues and procedures in the Watershed to be distributed to residents by both the Conservation Authority and other willing parties (lawyers, real estate agents, etc.)
 - attend municipal council meetings to remind councillors about the intent of flood plain policies and regulations.

Long Term Considerations

- to have fill line mapping completed for all municipalities
- as a part of the communications strategy, produce a video on flooding and related issues.

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Erosion

BACKGROUND

Since its formation, the earth's surface has been subject to erosional forces. On a slow and continuous basis, natural and human factors alter the landscape. Below is a summary of the natural and human erosional forces occurring in the Nottawasaga Valley Watershed



Erosion along the Nottawasaga River in Essa Township

Natural Factors (Geological Erosion)

Geological erosion is a natural and continuous process which includes natural soil creation and displacement in order to maintain a favourable balance. In general, erodability can be determined by three main factors: rainfall; wind; and stream movement. The degree of erosion that these factors have on the watershed depends on the following landscape characteristics; vegetative cover, soil type and surface slopes. The following chart summarizes the interrelationship between these factors and characteristics:

	Vegetative cover	Soil Type	Surface Slope
Rainfall	an established vegetative cover will make slopes and fields less susceptible to erosion caused by rainfall.	Non-cohesive soils such as sands are removed more readily by raindrop impact than cohesive soils such as clays.	The steeper the slope, the greater the chance for runoff and erosion in rainfall events.
Wind	An established vegetative cover will hold soils together thus making them less susceptible to removal by wind.	Non-Cohesive soils (eg. sand) are more readily picked up by wind movement than cohesive soils (eg. clay)	Steeper slopes will be less susceptible to wind erosion than gradual slopes as they slow down wind movement.
Stream Movement	An established vegetative cover will stabilize stream banks and will protect the bank in times of peak flow rates.	Non-cohesive soils (eg. sand) are more susceptible to being eroded through stream movement.	The steeper the stream bank slopes, the greater the chance for stream movement to erode the slopes.

Human Related Factors (Accelerated Erosion)

Human related factors may cause accelerated erosion, and activities such as deposition of silt in waterways, and the removal of fertilizer rich topsoil, can often affect water quality. In particular, livestock damage and land use practices are the two main human related activities that contribute to the deterioration and loss of soil in the Nottawasaga Valley Watershed.

1. Livestock Damage

Stream banks trampled by livestock will cause the bank to slump, the vegetation to destabilize, and the stream bank to widen and become shallower. This form of damage makes the site susceptible to erosion from both surface runoff of adjacent lands, and the stream itself. In general, controlling livestock access to streams is one effective way of rectifying the problem.

2. Land Use Practices

The cultivation of steep slopes, removal of fence rows, removal of forest cover, increased hardened surfaces (eg. Asphalt, gravel,) overgrazing and cultivation of land to the edge of stream banks are often contributing factors to erosion. In addition, the draining and destruction of wetlands has downstream impacts as there is unstable stream discharge.

In the early 1980's, staff of the Nottawasaga Valley Conservation Authority prepared a detailed report on erosion and sedimentation in the Nottawasaga Valley Watershed titled, Erosion and Sedimentation: A Comprehensive Study of the Problem. Through the interpretation of air photos and field inspections, staff were able to identify erosion prone areas, the extent of erosion and the probable cause of erosion. Information given in this report provides a good basis for understanding erosion related issues in the watershed, but it must be updated if it is to be utilized as detailed information.

ISSUES

Significant erosion is occurring in the Nottawasaga Valley Watershed due to both human and natural activity. There are a number of additional issues contributing to this problem:

- until recently, regulations were not consistently enforced across the watershed as the N.V.C.A. only regulated the importation and removal of fill in approximately half of the watershed municipalities
- the present overall extent of stream bank erosion in the Watershed is unknown and it is difficult to determine how much of an impact remedial measures are having.
- due to poor communication between resource management agencies and residents, some residents are unaware of the causes of erosion and preventative measures that can be employed
- new ideas regarding erosion control and drainage projects need to reach more contractors, farmers, and residents * a comprehensive land stewardship program is needed to provide information and services to landowners and desire assistance.

OBJECTIVE

To minimize erosion caused by human activity through the establishment and implementation of a comprehensive, priority based erosion control program within the Nottawasaga Valley Watershed.

RECOMMENDATIONS

- Using the format previously developed, the 1982 Report Erosion and sedimentation: A Comprehensive Study of the Problem will be updated and the following will be identified:
 - the location of erosion problems on a subwatershed basis
 - the extent or degree of erosion for each site
 - the causes of erosion for each site
 - recommendations for remediation or prevention for each site
- once the erosion report is complete, areas of concern will be identified and priorities established for rehabilitation and enhancement through bioengineering and land stewardship initiatives. In general, recommendations for remediation, enhancement or prevention shall include:
 - planting a vegetative cover adjacent to agricultural waterways
 - restricting livestock access to streams and providing alternative water sources, such as nose pumps
 - undertaking bioengineering measures on severely
 - degraded sites
 - encouragement for the preservation and conservation of all wetlands
 - the creation of windbreaks
 - the encouragement of natural channel systems wherever possible
 - regard for natural habitat components during erosion project construction
 - land stewardship and partnership building.
- a comprehensive erosion control program within the Nottawasaga Valley Watershed will be established in order to minimize erosion caused by human activity and this program will involve:
 - O.M.A.F.R.A., farming organizations, and the N.V.C.A. will work with residents and agriculturists to prevent erosion
 - the N.V.C.A. will encourage municipalities to introduce Top- Soil Preservation By-laws
 - the N.V.C.A. will promote O.M.A.F.R.A.'s program for training contractors and farmers on erosion control and drainage projects
 - the N.V.C.A. will work towards preparing and registering fill line mapping for all watershed municipalities
 - 100 year Erosion limits for the Watershed will be determined

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Development

BACKGROUND

As identified in the Growth and Settlement Policy Guidelines, land must be developed or redeveloped for new housing, businesses, industries, recreation areas, and accompanying infrastructure and services to accommodate population growth and economic activity. Since South Central Ontario (which includes the Nottawasaga Valley Watershed) is one of the most rapidly growing areas in the Province, the manner in which this growth is accommodated is paramount. When growth is poorly managed it can lead to sprawling settlement patterns, service deficiencies, and can threaten and/or degrade the quality of the environment and the availability and viability of natural resources. Conversely, if wisely managed, “growth can result in communities which are economically and environmentally sound which meets the full range of needs of current and future residents” (Ministry of Municipal Affairs, 1993).

ISSUES

- existing planning documents do not have the necessary controls to provide environmental protection based on the ecosystem approach
- development pressure is being experienced in headwater areas of the Watershed
- designation and zoning controls are in place, but they can be altered on a site specific basis - therefore it is difficult to measure the cumulative effects of development on a watershed basis when decisions are being made on a piecemeal basis
- development standards differ from municipality to municipality primarily due to different social values, geographic make-up, and zoning by-laws and official plans being prepared or updated at different times
- traditional agency response to development proposals is uncoordinated and often late in the development process and some agencies will not comment until a formal application is before them which often results in delays
- there are conflicting views regarding landowner rights

OBJECTIVE

To establish a coordinated and integrated development control and review process on a watershed basis in order to ensure that cumulative impacts on the system are prevented. This process will stress

- the need for a coordinated one window approach to resource management and land use planning
- a timely and efficient review that is based on sound science and recognizes economic constraints
- upfront input system stressing pre-development consultation and mediation
- clearly defined provincial and local level policy and guideline criteria
- agency staff who are well trained, informed, accountable, and service oriented

The Guide to Provincial Planned Applications

In the fall of 1992, Office of the Ontario Provincial Facilitator cohosted a series of day-long sessions with the development and building industry on improvements to the development approval process at the provincial level. As a result of these sessions, the Province produced a package of operational reforms, and included in these reforms was A Guide to Provincial Development Applications and new Complete Applications Forms. A guide to Provincial Development Applications gives developers and municipalities an indication of the information they need to prepare complete land use applications that meet provincial requirements. The guide focuses on applications that must be approved by the province or a municipality that has been delegated the Province's approval power. These applications include: official plan amendments, zoning by-law amendments, plans of subdivision, condominium plans, and consents. In general, A Guide to Provincial Development Applications provides a brief overview of the planning approval process, the types of planning approvals, and the provincial, municipal, and developers role in that process. This guide also provides specific information on:

- how to fill out the new provincial forms and other types of approvals that may be required
- specific techniques, such as hiring a consultant, predevelopment consultation meetings and project management are discussed with the aim of providing the applicant with the tools needed to manage his/her application throughout the process efficiently and effectively
- what the applicant can expect from the approval agencies
- relevant details that may enable the applicant to understand the process and provide the information that may be required

A Complete application form was also developed to go along with the guide. The new application forms, together with the guide, assist the applicant in providing the information needed for a timely review by the approval authorities.

Overall, these reforms are intended to: improve the planning process; speed up approvals; and improve the quality of development applications. In addition, the information provided will also be a useful reference for planners, consultants, and others involved in the planning system.

RECOMMENDATIONS

- pre-development consultation meetings with local review agencies, the municipalities and other stakeholders will become common practice
- the N.V.C.A. will coordinate meetings with the other resource management agencies in the Watershed to discuss:
 - the possibilities for streamlining the plan review process
 - the need to coordinate: agency review, the application of legislation, and monitoring and compliance on a watershed basis
 - establishing criteria to assist in determining how development can occur within the objectives of the Plan. For example, criteria may include the use of Best Management Practices where appropriate.
- resource management agencies and municipalities will utilize the Provincial Facilitator's Guide to Provincial Planning Applications and the Complete Applications Process to assist landowners when preparing development applications (see point of interest on the Complete Applications Process)
- the N.V.C.A., in cooperation with other resource management agencies, will assist municipalities to incorporate Environmental Policies into municipal planning documents.
- the N.V.C.A. will implement the methods of streamlining through watershed and subwatershed plans
- coordination through methods such as memorandums of understanding will be considered by resource management agencies and municipalities
- resource management agencies will work cooperatively with municipalities to help implement provincial policy in a fair and locally customized manner in order to meet the specific needs of the local municipalities
- the N.V.C.A. will prepare an extended version of the Watershed Plan to assist municipalities and consultants in preparing and reviewing development proposals (see Appendix: Watershed Plan Development for further detail)

Residential
Development in the
City of Barrie



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Watershed Management Plan

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COMMUNICATIONS

BACKGROUND

Effective communications are an integral component of resource management. In particular, the success of watershed planning and management lies in effective communications. Stakeholders need to be informed about the value and benefits of watershed planning and conversely resource management agencies need to hear and understand stakeholder needs and concerns. If these values and benefits are communicated effectively, “buy-in” or support for watershed planning and watershed plans is easier to obtain. In essence, regardless of its substantial benefits, unless people understand the basis of watershed planning and the benefits it offers, the concept will not receive the support it needs to be successful.

In the Nottawasaga Valley Watershed, communications efforts often focus on the environmental education of school children. Environmental issues are a strong component of science curriculums and there is a great demand for environmental education programs offered by resource management agencies. However, communications between resource management agencies and adult watershed stakeholders have not always been extremely effective. There are several reasons behind why many adult watershed stakeholders have not fully supported resource management initiatives. Nonetheless, it is important to recognize that this trend must change and people must become more involved.

ISSUES

Stakeholders need to be informed about the value and benefits of watershed planning and conversely, resource management agencies need to hear and understand stakeholder needs and concerns.

- there is a continuous need to inform and educate people about the watershed environment
- resource management agencies must understand and respect, the needs of the public more readily
- there are many different resource management agencies independently providing information/education services which has a number of implications:
 - there can be inconsistencies in the information provided
 - residents may be confused about where to obtain information
 - money could be saved by reducing the duplication of effort.
- the focus for resource issues is constantly changing, and it can be difficult to keep residents and other concerned stakeholders up to date on new issues
- in many instances, factors such as fiscal constraints have meant that communication efforts are often reactive - reflecting issues of concern at that time.
- resource information often becomes outdated and due to changing priorities, it is likely to remain outdated
- resource management issues are difficult to communicate on a broad level because often people are concerned only about the issues that directly affect them.

The Tiffin Centre for Conservation

Since its construction in 1992 at the Tiffin Centre for Conservation, the John L. Jose Environmental Learning Centre has accommodated approximately 8,000 school children per year from across the Nottawasaga Valley Watershed. While supporting school curriculum, Tiffin's education program strives to increase awareness, and an understanding for and appreciation of the natural environment. In support of N.V.C.A.'s mandate, sound practices of conservation and watershed management are emphasized in a variety of programs.

Presently, the Tiffin Centre offers 35 programs that can be divided into six general subject areas: aquatic studies, plant and soil studies, wayfaring (orienteering), wildlife, winter, and "quirks and quarks" (life skills, heritage, environment issues, etc.).

As with any education program, much work goes on behind the scenes. As a result, a volunteer corps has been established at Tiffin. Over the past two years, volunteers as well as co-op students from local area high schools have been a definite asset to our education programs. While at Tiffin, such support staff assist with the program setup, cleanup, implementation of programs, and other special products aimed at developing and maintaining the education programs. The assistance provided by our volunteers and students have proven to be invaluable to the operation of the Learning Centre.

OBJECTIVE

To effectively communicate the need for and benefits of comprehensive watershed planning and management to all watershed stakeholders, and to hear and understand stakeholder needs and concerns.

RECOMMENDATIONS

- the N.V.C.A., in conjunction with resource management agencies and non-governmental organizations, will prepare a comprehensive communications plan
- resource management organizations will continue to encourage residents to voice their needs and concerns through methods such as public forums, questionnaires, correspondence, telephone calls, and direct contact
- the communications section of resource management agencies will form partnerships to provide a more consistent, cost effective information base
- resource management agencies, non-governmental organizations (NGO's) and the development industry will share new resource management information with watershed stakeholders as it becomes available
- the N.V.C.A. will establish a land stewardship program to provide watershed stakeholders with a place to obtain information on watershed management and to discuss their needs and concerns
- the N.V.C.A. will encourage all resource management agencies and NGO's to have an annual communications workshop to share information, techniques, and discuss where communications efforts need to be aimed
- the N.V.C.A. will annually update their communications plan to ensure communications efforts are relevant and up-to-date and the Conservation Authority will continue to share the information with its resource partners.

Public Communications

Communicating effectively to and with the public can be a challenging task. Therefore, when undertaking a communications effort the following steps need to be addressed:

- identify what is to be communicated in the message
- identify the target groups to whom the message is directed
- determine the most effective means to deliver the message
- evaluate the effectiveness of the communication message.

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The banner features a dark, moody photograph of a forest floor with a single white flower in bloom. The title 'Watershed Management Plan' is overlaid in a white, serif font.

Watershed Management Plan

[HOME](#)An aerial photograph of a river winding through a green, forested landscape. The river is a light brown color, contrasting with the surrounding greenery.

The Goal of the Watershed Plan is the conservation of natural resources within our watershed in a cooperative, integrated manner in which human needs are met in balance with the need to sustain the natural environment.

FUNDING

To help ensure that it is implementable, the Watershed Plan is based on the most cost effective/methodology available. Funding implications have been considered for each recommendation by all relevant stakeholders. It has been determined that funding should reflect a proactive approach to watershed planning and management and should be considered on a long term basis. Funding implications for the implementation of recommendations in the Watershed Plan are summarized in the Implementation section of the Plan (see Figure 13). These recommended actions will be strategically phased-in, in the following manner.

- recommendations that require no new funding sources or result in cost savings, will be phased in within the first year
- recommendations that require a minimal level of new funding sources (\$) will be phased-in within 1 to 2 years
- recommendations that require relatively large amounts of new funding sources (\$\$) will be phased in from 1 to 5 years.

It is anticipated that new funding sources will come primarily through:

- increased efficiency created by the integration of existing programs and the reduction of duplication
- new funding partnerships
- “resource valuing” user pay principles.

Natural resources in the Watershed that have a true value should help to rationalize current and future management actions and priorities. For example, the cost/value of using water via a water taking permit must be addressed. Revenues generated from “water royalties”, for example could be used to help offset the cost of managing groundwater programs.

It is anticipated that the key players involved in the implementation of the Watershed Plan will prioritize the recommended actions from the Plan and set their budgets accordingly. For example, the N.V.C.A. is preparing a strategic plan in order to implement the Watershed Plan. This strategic plan prioritizes the recommended actions, estimates funding required to carryout the actions, and considers sources of funding and possible partnerships.

As funding priorities for watershed stakeholders may change over time, the funding responsibilities for implementation will be reviewed on a yearly basis to ensure that funding reflects the priorities of stakeholders.

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Commonalities Between Watershed Resource Issues and Recommended Management Actions

Overall, it became apparent that the watershed resource issues and recommended management actions discussed in the Watershed Plan could be summarized into 5 common themes:

- the preservation, conservation, enhancement, and rehabilitation of natural heritage features
- the conservation and improvement of surface water and groundwater quality and quantity
- the utilization of environmentally sound (friendly) land use practices
- a need to reduce overlap or duplication of services and programs offered for resource management
- communication needs for resource management

There was also a commonality in the recommendations offered to resolve watershed resource and management issues. In general, policy implementation and creation, taking responsibility, streamlining and coordination, partnerships, effective communications, and land stewardship all offer beneficial recommendations for these themes:

Policy Implementation and Creation -

Implement existing natural resource policies to preserve, conserve, enhance, and rehabilitate natural resources. Where there is a significant concern for a particular resource and no policy is in place, efforts should be made to establish a local policy.

Taking Responsibility -

All stakeholders must recognize their responsibility in natural resource management. Environmental issues and concerns need to be addressed promptly and efficiently.

The state of the environment must not fall victim to “finger pointing” or financial constraints. Watershed stakeholders need to take responsibility and work cooperatively to improve, preserve, enhance, and rehabilitate the environment

Streamlining/Coordination -

Resource management programs and services must be streamlined and coordinated in order to provide an efficient delivery of services. Pre-development consultation meetings, memorandums of understanding, and the sharing of resources are all methods of streamlining and coordination.

Partnerships -

Where there is a need in natural resource management for improved efficiency, shared expertise, better communications, shared funding, improved conservation or preservation, partnerships should be considered. Partnerships can be formed between any stakeholder group involved in watershed planning and management: between resource management agencies; between residents and resource agencies; between consultants and resource agencies; between residents and non-governmental organizations. Regardless of who is involved in the process, partnerships are an effective solution to many resource management issues in the Watershed.

Effective Communications -

People need to be informed and educated about natural resource management. Effective communications are a key component of watershed planning and management because they can improve land use practices, change attitudes, create awareness, and improve relations between watershed stakeholders.

Land Stewardship -

There needs to be a mechanism in place to allow watershed residents to become environmental stewards of their land. A land stewardship program can offer watershed residents: an opportunity to become involved in conservation extension programs such as tree planting or bioengineering; a “one stop shop” for information about resource management, policies, and legislation; an opportunity to assist in the preservation, conservation, enhancement, and rehabilitation of natural heritage features; and an opportunity to obtain advice and information on land management practices.

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Watershed Management Plan

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Implementing and Monitoring the Plan

Implementation

The Ministry of Municipal Affairs and Housing has identified in Ontario's Planning Reforms that an efficient and effective system of land use planning is integral to the environmental, economic, and social well being of the people of Ontario. It is the objective of the Province of Ontario to create an ecosystem planning process that meets the needs of the community, the economy, and the environment. In concert with provincial directives found in documents such as Cross Boundary Issues in South Central Ontario, municipalities are encouraged to work together to address cross-boundary issues on a watershed basis. The Ministry of Environment and Energy and the ministry of Natural Resources have reinforced this approach through the preparation of three guideline documents on watershed planning and management. These guideline documents identify that watershed plans are the vehicle in which to address cross-boundary water resource issues. In particular, watershed and sub-watershed plans are intended to provide a large component of the environmental background required to prepare new municipal official plans.

In general, the implementation of the Watershed Plan will occur through land use planning documents, subwatershed plans, local agency policy and programs, and land stewardship initiatives.

The goals, objectives, and recommendations of the Nottawasaga Valley Watershed Management Plan can be implemented through a wide variety of methods. For each watershed resource and management topic discussed in the Plan, the means to resolve issues are provided as recommended actions.

[Figure 13](#) provides a summary of the key recommended actions and indicates stakeholder responsibility for implementing these actions. In general, the implementation of the Watershed Plan can occur through land use planning documents, subwatershed plans, local agency policy and programs, and land stewardship initiatives. It is important to note that all watershed stakeholders have an important role in the implementation of this Plan. With cooperation from all stakeholders, watershed resources can be managed effectively and consistently

INTEGRATING WATERSHED PLANNING THROUGH THE LAND USE PLANNING PROCESS

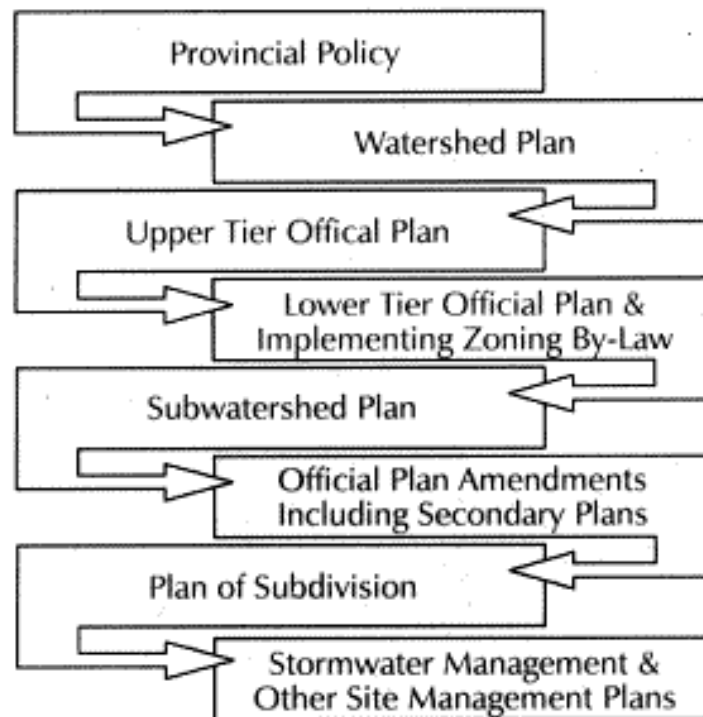
In order for a watershed plan to achieve success it is essential to incorporate the plan's goals and objectives into municipal land use planning documents. The key documents within the land use planning process are the upper tier and lower tier official plans. An official plan is a policy document that sets the goals and objectives for land use within the local, county, or regional municipality's jurisdiction. In accordance with provincial policies and directives, an official plan provides direction for future planning activities and deals primarily with the physical aspects of expected growth and development. To ensure that land use planning occurs in an environmentally responsible manner, it is therefore important that official plans promote and implement the objectives of watershed plans.

Currently within the Nottawasaga Valley Watershed, two upper tier levels of municipal government, the County of Simcoe and the County of Grey, are in the process of preparing an official plan. The Nottawasaga Valley Conservation Authority has been actively involved in promoting the integration of water management objectives into the County of Simcoe's Official Plan. The N.V.C.A. believes that it is crucial to ensure tier plans will contain water management policies as lower tier plans will conform to the upper tier documents. Nonetheless, the Conservation Authority will encourage that lower tier plans contain water management objectives that reflect the significant water-related features of each municipality. The Conservation Authority will also recognize that municipalities should have the flexibility within local planning documents to reflect unique or local circumstances during this process as well. In general, the N.V.C.A., in cooperation with other watershed stakeholders, will encourage the inclusion of policies in upper and lower tier plans related to the following underlying themes:

- the recognition of and commitment to the importance of water resources
- a commitment to the integration and coordination of water resource management
- a commitment to the preservation, conservation, enhancement, and rehabilitation of significant natural heritage features
- the enhancement of water conservation practices
- the maintenance and enhancement of groundwater and surface water quality and quantity
- the control of discharges into surface water and groundwater
- the identification and protection of significant recharge/ discharge areas, and headwater areas
- the protection of human life and property from water-related hazards

The N.V.C.A. will encourage that official plans identify implementation mechanisms, such as subwatershed plans and stormwater management plans to ensure that the linkage between watershed planning and land use planning established. Specific details from watershed management should be implemented through comprehensive and site-specific zoning by-laws, site plan and subdivision agreements, and the purposed development permit process. This process can be summarized by Figure 14.

Figure 14: Integrating Water Management Objectives into Municipal Planning Documents



Source: Adapted from M.O.E.E., M.N.R., *Integrating water Management Objectives into Municipal Planning Documents* (Toronto: Queen's Printer for Ontario, 1993), p.4.

Another important component to assist municipalities and developers to incorporate watershed planning and management objectives is a resource management directory. This directory would include all relevant policies and legislation for watershed planning and management, who is responsible for implementing the policies and legislation, and how to incorporate watershed planning and management objectives into municipal documents and land use proposals.

OTHER MECHANISMS FOR IMPLEMENTATION

Subwatershed Plans

included in these subwatershed plans is summarized in Figure 17.

It is not the intent of the Watershed Plan to delay development pending the implementation of subwatershed studies. Rather, the undertaking of subwatershed plans is a voluntary process that requires municipal support. If a municipality determines that a subwatershed plan is appropriate for a particular area, the Conservation Authority will coordinate and facilitate the preparation of the plan for the municipality.

Figure 16: General Stresses on Urban and Rural Subwatersheds

Urban Subwatersheds

Bear Creek - Development pressures from the City of Barrie and the Community of Angus.

Beeton Creek - Existing concerns for impacts from sewage treatment facilities and development pressure is present.

Blue Mountain Watershed - Need to preserve and conserve natural features and local support present.

Coates Creek - Small watershed with intensive land use and development potential exists for the Community of New Lowell.

Innisfil Creek - Development pressure along the Highway 400 corridor and from the Community of Cookstown.

Lamont Creek - Development pressure from Stayner and concerns for impacts from sewage treatment facilities.

Mad River/Noisy River - Development potential for small communities in the area.

McIntyre Creek - Area is severely degraded and there is concerns for impacts from sewage treatment facilities.

Nottawasaga Bay - Intensive urban development along the shoreline and potential for future development exists. A shoreline management plan is needed for this area.

Willow Creek - Development pressures from the City of Barrie and

Rural Subwatersheds

Bailey Creek - Need to preserve the water quality of the area.

Boyne River - Predominately rural with intensive agriculture in the middle reaches. Potential development in the future.

Marl Creek - Primarily rural lands with some intensive agriculture.

Matheson Creek - Primarily rural lands with extensive forests and some development in headwater areas.

Lower Nottawasaga River - Impacts from land use in the area (eg. recreational, agricultural).

Middle Nottawasaga River - Fairly intensive agricultural land use and significant erosion problems.

Upper Nottawasaga River - Development potential for Hockley Valley and existing concerns for degradation from land use practices.

Penville Creek - Development potential exists for Bond Head and the Highway 400 corridor.

Pine River - Potential growth of small communities such as Lisle, Everett, Mansfield, Hornings Mills and impact of land use in C.F.B. Borden.

Sheldon Creek - Intensive agriculture in the lower reaches.

Sturgeon Creek - Drains into Wasaga Beach. Small rural area with possible development pressures in the future.

Thornton Creek - Development potential exists for the Community of Thornton.

the Community of Midhurst.

Figure 17: Components of Urban and Rural Subwatershed Plans

Urban Subwatersheds

Urban subwatershed studies require intensive and detailed information to address local environmental issues as they relate to development and land use. This type of study will include:

- specific subwatershed targets, goals, and objective to establish:
 - surface and groundwater quantity and quality management
 - natural system linkages and functions
 - areas of environmental constraints
 - best management practices for subdivision design
 - the enhancement and rehabilitation of natural features
 - management practices for open space areas and green space corridors.
- specific implementation targets and responsibilities for all recommended actions
- an outline of directives for stormwater management plans and other studies/designs for specific areas within the subwatershed.

Rural Subwatersheds

Rural subwatershed studies are less intensive than urban studies: This type of study will:

- provide a general inventory of significant natural heritage features
- outline areas for conservation, preservation, enhancement, and rehabilitation
- provide recommendations and suggestions to municipalities, developers, and residents for land use management practices
- provide specific implementation targets and responsibilities for all recommended actions
- where a significant subdivision development is proposed in a rural watershed the study criteria may be expanded to incorporate urban watershed considerations.

Study to Include

Policies and Programs

Policies and programs delivered by local agencies, such as septic system policies for a District Health Unit, are other mechanisms that can implement the Watershed Plan. If a local government agency identifies an area of concern with regard to water resources, the ideologies and objectives in the Watershed Plan can be used to support the proposed policy.

Land Stewardship

Another method for implementing the Watershed Plan is through land stewardship initiatives. A landowner resource centre would provide watershed residents with a common place to obtain resource management information and advice. Furthermore, a landowner resource centre would provide services such as tree planting, or bioengineering needed to enhance, restore, or rehabilitate lands in the Watershed. Land trusts could also be facilitated through the landowner resource centre. Watershed residents interested in establishing a land trust could obtain advice and direction from staff involved in land stewardship initiatives.

Monitoring

Monitoring the success of the Watershed Plan, and the achievement of its goals and objectives will occur in the following manner:

1. It is intended that the Watershed Plan shall be subject to continuing review by the Planning Team and the Nottawasaga Valley Conservation Authority's Full Membership. Whenever it is deemed necessary, due to changing environmental, economic, technical, or social trends in the Nottawasaga Valley Watershed, the Plan will be amended. Significant amendments will involve a public participation process.
2. It is intended that the N.V.C.A. will hold a yearly meeting for determining the need for revisions to the Watershed Plan.
3. In reviewing this Watershed Plan, appropriate documents shall be forwarded to municipalities and Planning Team members for input and review. Notice will also be given in local newspapers to provide any concerned stakeholders with an opportunity to obtain a copy of relevant information in order to provide input and review

Monitoring the performance and success of the management actions used to achieve the objectives developed by the Plan will occur in the following manner:

1. Water quality sampling data from the Nottawasaga Rural Beaches Program, N.V.C.A. and M.O.E.E. water quality sampling, and research by the Waterloo Centre for Groundwater Research will be used as an indicator of water quality. This data from water quality sampling will indicate whether or not the recommendations provided in the Plan have maintained and/or improved water quality in the Watershed.
2. Information gathered by the Ministry of Natural Resources on fish and wildlife trends will be used as an indicator for measuring the effectiveness of the recommendations for natural heritage features.
3. The Watershed Report Card, a user-friendly method for assessing watershed health, will be used to determine the current health of the Watershed, identify areas of concern, and what can be done to improve the overall quality of resources in the Watershed. It will then be assessed as part of the 5 year review to assist in determining whether objectives have been achieved.
4. A questionnaire will be circulated to municipalities, Planning Team members, and other stakeholders 2 years following the adoption of the Watershed Plan to determine if the Plan is: useful, implementable, and generally meeting its objectives and goals.

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Appendix: Watershed Plan Development

STAGE 1: INITIAL PROCESS

The Guideline Documents for Watershed Planning In June 1992, the Ministry of Environment and Energy (M.O.E.E.) and the Ministry of Natural Resources (M.N.R.) released three documents that established direction for the wise management of water and related natural resources. These documents; Water Management on a Watershed Basis, Subwatershed Planning, and Integrating Water Management Objectives into Municipal Planning Documents, are intended to provide guidance for watershed planning, and to assist in the consistent applications of provincial policies and programs. To test the practicality of these documents, 5 subwatershed studies, including the Nottawasaga Valley's Watershed Plan, were chosen by the above-noted ministries as pilot projects. In order to prepare the Watershed Plan as a pilot project, the N.V.C.A. received funding from the M.N.R. And watershed municipalities.

As a pilot project, the N.V.C.A. was directed to use the three M.O.E.E./ M.N.R. documents as a foundation for the Watershed Plan. By using these documents as a guide, the N.V.C.A. Was able to provide input to the two ministries on the value and practicality of the documents.

Developing Terms of Reference

Early in the process, terms of Reference for the Watershed Plan were established. These terms clearly identified the following:

- the process to be followed in preparing the Plan
- the extent and comprehensiveness of the document
- the timing and scheduling for Plan preparation
- the responsibilities of everyone involved
- the format and content of the Watershed Plan

Establishing a Steering Committee and Working Groups

Three key groups were established for the preparation of the Watershed Plan (see Figure (A)). These groups were:

The Core Team

The Core Team was comprised of the N.V.C.A.'s Chief Administrative Officer, Project Planner for the N.V.C.A., And he Watershed Plan Coordinator. This team was responsible for providing N.V.C.A. staff with direction on the Watershed Plan.

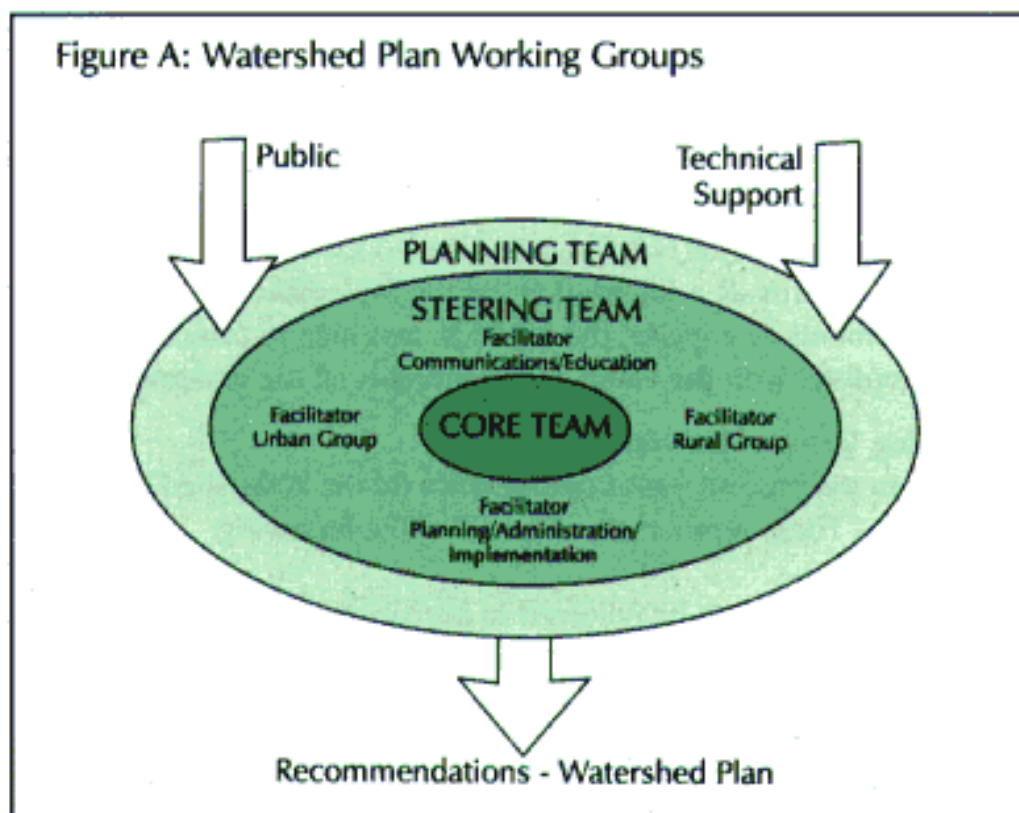
The Steering Team

The Steering Committee consisted of the Core Team and the Facilitators (N.V.C.A. Senior staff) for the four Planning Team working groups. This group was responsible for conducting Planning Team meetings and acting as a liaison between the Planning Team and the Conservation Authority.

The Planning Team

The Planning Team, whose purpose was to brainstorm, Identify and analyze issues, provide recommended strategies, and assist in developing policy, was the main decision making body for preparing the Plan. In addition, a Technical Support Team, and the Public were involved in the preparation of the Watershed Plan. The technical support teams assisted in providing background information and technical advice on watershed issues, and the public assisted in identifying key issues in the Nottawasaga Valley Watershed and provided input into the final draft document.

STAGE 2: PLAN PREPARATION



The Planning Team

In the summer of 1993, it was determined that a multi-stakeholder Planning Team would be established to be the driving force in the preparation of the Watershed Plan. Initially, potential members for the Team were notified of the opportunity to become involved in the Plan through a questionnaire that was circulated through the Watershed in the month of June, and through newspaper advertisements. In addition, N.V.C.A. staff also directly contacted a number of organizations who did not respond to the questionnaire. In general, all persons who expressed an interest in being involved in the Plan were placed on the Team. To ensure that a broad range of interests and concerns were identified in the Watershed Plan, the Planning Team was composed of members representing a wide range of interests (see Figure B). The 60 member Planning Team consisted of representatives from; government agencies and organizations, upper and lower tier municipalities, the development industry, adjacent conservation authorities, the watershed community (residents), non-governmental organizations, interest groups, and N.V.C.A. staff and members. Beginning in October 1993, the Planning Team met on average once every six weeks until December 1994, in order to provide direction to N.V.C.A. staff preparing the Plan. One of the main functions of the Planning Team was to undertake issue identification and analysis. In order to carry out this process, the Team was divided into four working groups: Rural; Urban; Communications/education; and Planning/Implementation/Administration.

Figure B: Planning Team Representation

- Ministry of Natural Resources
- Ministry of Environment and Energy
- Ministry of Municipal Affairs and Housing
- Ontario ministry of Agriculture, food and Rural Affairs
- Simcoe County District Health Unit
- Simcoe County Board of Education
- County of Simcoe
- Watershed Municipalities
- Consultants
- Local Interest Groups (eg. Collingwood Senior League)
- Non-Government Organizations (eg. North Simcoe Environmental Watch)
- Watershed Residents and Land Owners
- Grey Sauble Conservation Authority
- Metro Toronto Region Conservation Authority
- Credit Valley Conservation
- Lake Simcoe Region Conservation Authority
- Nottawasaga Valley Conservation Authority staff and membership

Issue Identification and Analysis

The four working groups of the Planning Team received a list of issues that could be analyzed. This list, which was derived from issues identified by watershed residents in the two previously circulated questionnaires, was reviewed further by the working groups. Once the issues were prioritized, the working groups began the process of issue analysis. To guide the groups through issue analysis forms were developed (see Figure C). These forms include: a description of the present situation; current programs and agency involvement for the issue; a summary of the present situation; an objective; optional strategies, with pros and cons (resisting and driving forces); and recommended strategies on a short or long term basis.

When conducting issues analysis, the facilitators encouraged all group members to voice their opinions and individually fill out an issue analysis form. The following steps outline the process that was used for issue analysis:

- available background information was reviewed
- for each watershed resource and management topic, working group members discussed their views and opinions
- on a flip chart or issue analysis form, a designated recorder transcribed the group's impressions of the present situation, current legislation, and objective for the topic
- the working group brainstormed and listed a number of optional solutions for the topic
- from the optional strategies, the working group chose the best solutions to be used as recommendations for the Plan
- the group's issue form, and any individual forms from members, were given to the Watershed Plan Coordinator who compiled them (if necessary) into one issue analysis sheet

After the issue forms were compiled, the information contained in the forms was used as a basis to develop the Watershed Resource Issues and Recommended Management Actions section of the Watershed Plan. In particular, these information forms were utilized in writing the background, issues, objective, and recommendation components of each watershed resource issue and management action.

Figure C: Issue Analysis Forms

The figure displays three overlapping forms used for issue analysis. The top form is a table with columns for 'OPTIONAL STRATEGIES', 'PROS', and 'CONS'. The bottom-left form, titled 'ISSUE ANALYSIS', contains fields for 'Issue:', 'Group:', 'What do you see as the present situation?', 'Current Program', 'Agency/Organization Involvement', 'SUMMARY OF PRESENT SITUATION:', and 'OBJECTIVE:'. The bottom-right form, titled 'ISSUE' and 'GROUP', contains a table with columns for 'RECOMMENDED STRATEGIES', 'SHORT TERM', and 'LONG TERM'.

STAGE THREE: ADOPTING THE PLAN

Three phases were undertaken after the preparation of the draft plan:

Phase 1 - Input and Review from the Planning Team

The draft Watershed Plan was circulated to all Planning Team members for input and review before its release to the public. Members were asked to read the draft Plan and provide comments in a provided workbook. This process ensured that the Plan accurately reflected the intent and preferences of the Planning Team.

Phase 2 - Input and Review from Municipalities, Watershed Residents, Governmental/Non-Governmental organizations, the Development Industry, and Special Interest Groups

Once the recommended revisions from the Planning Team were incorporated into the draft Plan, the newly revised Watershed Plan was circulated to municipalities, interested watershed residents, governmental/ non-governmental organizations, the development industry, special interest groups, and the N.V.C.A. full membership. Given that public review and input is a critical component of watershed plan preparations, efforts were made to reach as many stakeholders as possible.

Presentations were made to the Councils of all 18 Watershed municipalities. The purpose of these presentations was twofold: to inform councilors and staff about the Watershed Plan; and to address any issues or concerns regarding the Plan. Those involved in preparing the Plan believe that this process was essential in ensuring that municipalities understood and supported the watershed planning initiative, and that municipal needs were addressed by the Watershed Plan. This form of presentation was also used for resource management agencies.

Four open houses for the public were held across the Watershed. These open houses provided watershed residents and any other stakeholders with an opportunity to discuss the Watershed Plan and raise any concerns. In addition to the above initiatives, approximately 300 copies of the draft Watershed Plan were mailed out to interested residents, the development industry, governmental and non-governmental organizations, and special interest groups in the Nottawasaga Valley Watershed. All persons who received a copy of the draft Plan were notified about the public open houses and were encouraged to phone in or send in their comments to the Conservation Authority. This process attempted to ensure that all stakeholders had an opportunity to review and provide input into the Watershed Plan.

The Watershed Plan was also provided to the N.V.C.A. full membership for review. Two municipalities requested additional presentations to council to clarify any concerns. Several meetings were also held with municipal staff to revise the text. The final draft of the plan was presented to the N.V.C.A. Full authority on October 27, 1995 and it was approved with a recorded vote of 18 yes and 5 no.

Phase 3 - Plan Circulation

Once the input and review was complete, the recommended revisions were incorporated (with Planning Team approval) and the final Watershed Plan was produced. Once the Plan was published, it was mailed out to identified stakeholders for their information. It should be noted that extended and short versions of the Watershed Plan were produced for municipalities and interested consultants. This extended version includes:

For Municipalities: <ul style="list-style-type: none">the Nottawasaga Valley Watershed Plancomplete application formsrelevant resource mapping (eg. fill lines, M.N.R. resource mapping, flood lines) at a municipal levelresource mapping on a watershed basis.	For Consultants: <ul style="list-style-type: none">the Nottawasaga Valley Watershed Plancomplete application formsrelevant resource mapping at a watershed level (i.e. M.N.R. resource mapping that includes wetlands, deer habitat, coldwater streams)a chart indicating availability of flood and fill line mapping in the watershed.
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The extended version of the Watershed plan is set up to accommodate new information as it becomes available. 3000 executive summary versions of the Watershed Plan have been produced in booklet form to provide watershed stakeholders with a general overview of the Watershed Plan.

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Nottawasaga Valley

Conservation Authority

Watershed Management Plan

1996-2015



The goal of the Watershed Plan is the conservation of the natural resources within our Watershed in a cooperative, integrated manner in which human needs are met in balance with the need to sustain the natural environment.

References

Information utilized in the document was taken from a variety of sources. Below is a summary of the sources that have been quoted, paraphrased, or used as general information in this document.

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