SMART GROWTH ISSUE PAPERS

GREENLANDS IN THE CENTRAL ONTARIO ZONE

2003

DONALD M. FRASER

This is fourth of a series of nine issue papers commissioned by the Neptis Foundation for consideration by the Central Ontario Smart Growth Panel established by the Government of Ontario.

Fraser's paper looks at all non-urban, non-agricultural land within the Central Ontario Zone. He describes the current state of greenlands protection in the Zone and explains the process by which, under current laws, development is often allowed to occur on designated greenlands and the reasons why even designated greenlands may become degraded over time. Fraser identifies the features that are most threatened—by development, recreational uses, agriculture, aggregate extraction, roads and utilities corridors—and recommends a program of identification, policy enforcement, acquisition, and management of greenlands that could become part of a smart growth strategy.

NEPTIS THE ARCHITECTURE OF URBAN REGIONS

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1 Agriculture in the Central Ontario Zone
2 Air, Water and Soil Quality
3 Energy and Smart Growth
4 Greenlands in Central Ontario
5 The Growth Opportunity
6 Smart Development for Smart Growth
7 Smart Growth and the Regional Economy
8 Social Change in the Central Ontario Region
9 Travel Demand and Urban Form

Neptis is an independent Canadian foundation that conducts and publishes nonpartisan research on the past, present and futures of urban regions. By contributing reliable information, expert analysis and fresh policy ideas, Neptis seeks to inform and catalyze debate and decision-making on regional urban development.

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Table of Contents

1. Introduction

This issues paper is intended to assist the Central Ontario Smart Growth Panel in developing an understanding of the current status of greenlands in this area of the Province. There is a widespread and growing concern among the public that the natural environment of the Central Ontario Zone is slowly being lost or degraded in the face of urban sprawl and scattered, unfocused development. Many people need to feel connected to the natural world around them and want to live in "green" communities, where steps have been taken to preserve unique natural areas and provide the public with access to parks and other open space amenities. This vision is reflected in one of the six stated goals of Ontario's Smart Growth initiative:

There is widespread and growing concern among the public that the natural environment of the Central Ontario Zone is slowly being lost or degraded in the face of urban sprawl and scattered, unfocused development.

> *Smart Growth will work to protect the quality of our air, our land and our water by steering growth pressures away from significant agricultural lands and natural areas.*

A further objective of the strategy, as outlined in the *Province's Smart Growth Consultation Paper*, released in fall 2001, is that Ontario will **"create permanent protection for significant natural areas."** This is a commendable objective, but achieving it will require a concerted effort on the part of the provincial and municipal governments, the development industry, and conservation organizations alike to fundamentally change the way we approach greenlands protection. Recent initiatives such as the Oak Ridges Moraine Conservation Plan represent a major step in this direction, but there is still a long way to go.

The concept of greenlands and their protection has been at the forefront of the discussion regarding urban planning, first gaining prominence with the release of the Kanter Report in the early 1990s. Over the past few year greenlands have come under even greater scrutiny in response to widespread municipal restructuring and amalgamation, legislation to protect the Oak Ridges Moraine, and the Province's Smart Growth initiative.

The concept of greenlands first gained prominence with the Kanter Report of the early 1990s.

This paper will attempt to:

- identify the different kinds of greenlands found in the Central Ontario Zone;
- assess the degree of protection they currently receive;
- identify where the greatest pressures are being exerted on greenlands;
- highlight some of the major planning issues surrounding greenlands.

The paper will also present approaches to greenlands protection that might be incorporated into a smart growth strategy, with emphasis on

some of the short-term measures that could be acted upon within the next three years. The consequences (both positive and negative) of implementing these approaches and potential barriers to their implementation are also identified.

2. What are greenlands?

In the study currently being undertaken by Gartner Lee Limited on behalf of the Neptis Foundation, greenlands are very broadly defined to include any non-urbanized areas, including agricultural land, and open space parkland such as municipal parks and Conservation Areas. In previous studies, specifically the Kanter Report, greenlands were defined as elements of the natural environment or specific areas that had been recognized by a planning authority (such as a provincial ministry, conservation authority, or municipality) on the basis of some intrinsic ecological significance or sensitivity. This recognition is often translated into some degree of protected status being assigned to the feature, either through provincial or municipal land use policy.

For the purposes of this issues paper, a hybrid definition of greenlands has been adopted that includes all non-urban land with the exception of active agricultural land. Agricultural land is the subject of a separate Issue Paper in this series and should be considered as a distinct land use type with unique issues for smart growth. However, abandoned agricultural land, if left to undergo natural succession, will quickly revert to an old field or cultural thicket community with considerable ecological value and these areas can also be considered greenlands. In this case the definition is based on land cover rather than on an Official Plan designation or ownership, in recognition of the fact that many lands zoned Agricultural or Rural contain woodlands, wetlands and old field habitats. It should also be noted that the broad definition of greenlands used here includes not only the terrestrial or land-based elements of the ecosystem, but also encompasses water-based features such as streams, creeks, rivers, ponds, and lakes.

In this paper, greenlands are defined as all non-urban land with the exception of active agricultural land (abandoned agricultural land is included).

Greenlands, therefore, include the following features:

- Provincially Significant Wetlands*
- Locally Significant Wetlands
- Unevaluated Wetlands
- Provincially Significant Areas of Natural and Scientific Interest (ANSIs)*
- Regionally Significant ANSIs
- Significant Woodlands*
- Unevaluated Woodlands
- Significant Valleylands*
- Significant Wildlife Habitat*
- Threatened and Endangered Species Habitat*
- Fish Habitat*
- Watercourses and Waterbodies

- Environmentally Significant (or Sensitive) Areas (ESAs)
- Other miscellaneous municipal designations (see below)

Features marked with an asterisk are considered significant elements of a Natural Heritage System under Section 2.3 of the Provincial Policy Statement (PPS). These are features deemed to be significant at a provincial level, the loss of which would have an adverse impact on the Natural Heritage System of Ontario.

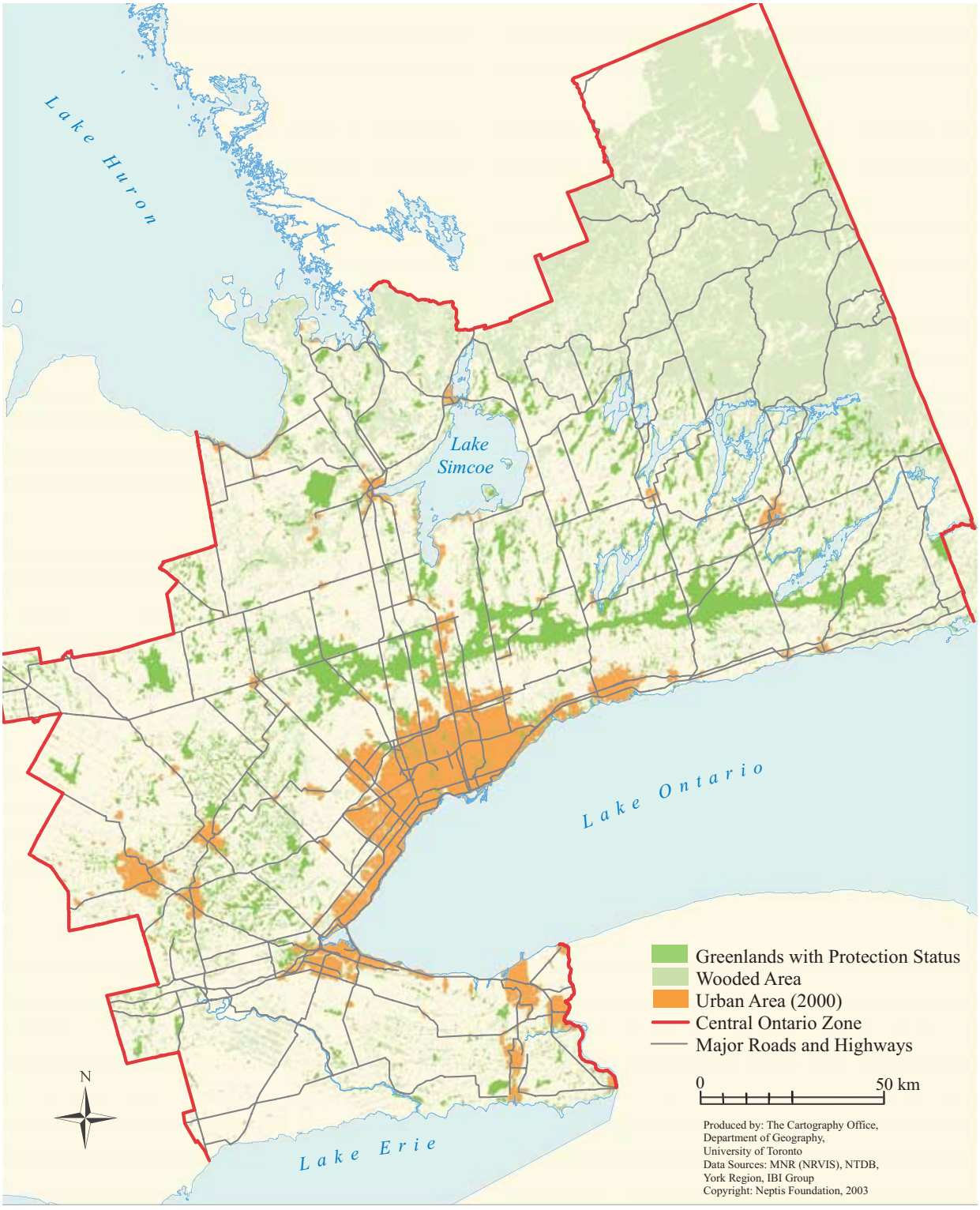
ESAs are often identified at a broad-scale watershed level by a Conservation Authority or, in some cases by an upper-level municipality (e.g., Halton Region). Waterloo Region has identified Environmentally Sensitive Policy Areas in its Official Plan. Simcoe County includes "Greenlands" as an Official Plan designation, while both Peel Region and Wellington County identify "Core Greenlands." Durham Region has mapped "Major Open Space Systems" and the Niagara Escarpment Plan identifies "Natural Areas." It is important to note that many of these greenland areas represent more than one feature of ecological significance. For example, it is not unusual for a Significant Wetland to also be classified as an ANSI or ESA, while fish habitat is often associated with a watercourse contained within a Significant Valleyland.

Many greenland areas represent more than one feature of ecological significance: a Significant Wetland may also be classified as an ANSI or ESA, or fish habitat may be a river in a Significant Valleyland.

See Appendix A for more detailed definitions of the greenlands features discussed here and Appendix B for a glossary of some technical terms. The location and distribution of greenlands across the Central Ontario Zone is depicted in a very general fashion in **Figure 1**.

Figure 1: Greenlands Systems in Central Ontario Zone

The greenland features for the regional greenlands map include Natural Environment land use class from the Niagara Escarpment Plan, Natural Core and Corridors land use classes from the Oak Ridges Moraine Conservation Plan, provincially evaluated wetlands, and conservation areas. These geospatial data sets have been generalized to accommodate and 8 1/2 x 11 format.



3. The current state of greenlands protection

The Central Ontario Zone consists of 17 upper-tier municipalities and 99 lower-tier municipalities, each of which is governed by an Official Plan that contains some policy direction regarding the protection and management of various aspects of the natural environment. Vast portions of the Zone fall within the either the Oak Ridges Moraine Planning Area or the Niagara Escarpment Planning Area, where many areas are fully protected from development and land use elsewhere is strictly controlled by provincial regulations.

Large areas of the Central Ontario Zone fall within either the Oak Ridges Moraine Planning Area or the Niagara Escarpment Planning Area.

However, the degree of protection afforded by Official Plans varies greatly, from full protection for some greenlands features to virtually no protection for others. As a general rule, the only true consistency among the Official Plans of Central Ontario municipalities located south and east of the Canadian Shield is that they give full protection to the two features of provincial interest within which development is prohibited under the PPS: Significant Wetlands and the Habitat of Threatened and Endangered Species. These are the two "sacred cows" of natural heritage from the Province's perspective and their protection is generally accepted as a given among land use planners and developers. Provincially Significant Wetlands in those portions of Simcoe County, Peterborough County, Haliburton County, and the City of Kawartha Lakes that lie on the Canadian Shield are not accorded the same level of protection under the PPS, although some are recognized as equally significant at the municipal level.

The degree of protection afforded by Official Plans varies greatly, from full protection for some greenlands features to virtually no protection for others.

Under the federal *Fisheries Act*, fish habitat is accorded a higher degree of protection than that given under the PPS, and those who harm fish habitat face strict penalties in the form of fines and/or imprisonment. As a general rule, development or site alteration is prohibited from well-defined valleylands (not just those identified as "significant") by Conservation Authority flood and fill line regulations. Although this has the effect of protecting the physical form of a valley, there is no guarantee that the quality and quantity of the watercourse that occupies the valleyland will not deteriorate. Headwater areas are often most at risk because these smaller, often intermittent tributaries are not typically associated with valley features and do not always provide fish habitat. In recognition of the vulnerability of these important headwater tributaries, some Conservation Authorities and municipalities (such as the Town of Markham) have begun to develop specific policies to address the protection of these features.

The protection of Significant Wetlands and the Habitat of Threatened and Endangered Species is generally accepted as a given among land use planners and developers.

The two greenlands features that have consistently "fallen through the cracks" so to speak, are Significant Woodlands and Significant Wildlife Habitat. This is because, through the PPS, the Province has given full

responsibility for the identification of these features to the appropriate planning authority (such as a municipality), few of which have undertaken the studies necessary to define these resources at a local level. To my knowledge, the Regions of Ottawa-Carleton, Halton, Niagara, and Waterloo are among only a handful of upper-tier municipalities that have embarked on an ambitious initiative to define Significant Woodlands at a regional level. The Province has recently produced technical "guidelines" to assist in the identification of Significant Wildlife Habitat, but has not yet done so for Significant Woodlands. These two greenlands types remain largely unrecognized, unmapped, and thus largely unprotected throughout the Central Ontario Zone.

The Provincial Policy Statement gives full responsibility for identifying Significant Woodlands and Significant Wildlife Habitat to municipalities, but few have undertaken the studies necessary to define these resources locally.

The majority of municipalities that have recently updated their Official Plans have, as required, brought them into conformity with the PPS. However, although the Official Plans **recognize** significant natural heritage features, and generally **discourage** development or site alteration from occurring within them, they do not grant any absolute prohibition on development. Instead, consistent with the direction provided by the PPS, development or site alteration within a prescribed distance of a significant natural heritage feature must be supported by an Environmental Impact Statement (EIS).

Although municipal official plans recognize significant natural heritage features and generally discourage development on them, they do not absolutely prohibit development. Development may proceed if supported by an Environmental Impact Statement.

The ultimate test of an EIS, at least on paper, is very high: it must demonstrate that development will have "no negative impact" on the greenlands feature or its functions. Taken at their most literal meanings, the notions of "no negative impact" and "no loss of form or function" strongly suggest that a development application would be denied if the EIS clearly demonstrated that the feature or area in question would experience any measurable decrease, however small. For example, a reduction in one nesting pair of a given bird species, no matter how common, could arguably constitute a "loss." In practice, however, the test of "no loss" is often considered to be met as long as the "reduction" does not entail an absolute loss of an attribute or function. Recently, several Ontario Municipal Board decisions have upheld the argument that some loss of greenlands feature or function is acceptable and the OMB has approved development on this basis.

Several recent Ontario Municipal Board decisions allowed some loss of greenlands features or functions as the result of development.

The outcome of an EIS is usually the approval of some form of development, with conditions attached as to specifically how and where it can occur in relation to the greenland feature. Sometimes development is permitted within the less significant or sensitive portion of the feature, but rarely is the entire feature either removed or fully protected. Most often, the EIS provides recommendations on the size of and uses permitted within a buffer between the feature and the development. The ability to mitigate environmental impacts, often through fairly elaborate, expensive, and unproven engineering, is the rationale usually provided in support of an undertaking. Rather than determining whether a proposed undertaking is

The outcome of an EIS is usually the approval of some form of development, with conditions that specify how and where it can occur in relation to the greenland feature.

environmentally acceptable or not, an EIS has increasingly become a tool for determining the type and extent of mitigation required to permit a development to proceed.

Another important issue to ponder is whether the current policy framework is doing its job with respect to greenlands protection. In many instances, the outcome of an application is that the physical feature (such as a significant wetland or a woodlot or valley) is afforded protection from development; however, its actual function becomes impaired over time. For example, recent studies in southern Ontario have shown that the composition, structure, and productivity of ground nesting and neotropical breeding bird communities inhabiting small woodlots is lower when residential units are built close to the woodlots. Other impacts include uncontrolled human access, trampling, tree removal, dumping of yard waste, and the introduction of invasive plant species, all of which contribute to the overall degradation of the feature. The effects of a major change in adjacent land use on a greenlands feature are rarely measured or monitored following construction. Despite the best efforts of developers, planners, politicians, and conservation groups, it is far from certain that its function or overall ecological integrity of a given area will be safeguarded as a result of its physical protection.

Even when a feature is protected, its function may become impaired over time. Woodlots near residential subdivisions may gradually lose their communities of birds, or suffer from the introduction of invasive plant species. These long-term effects are rarely monitored after construction.

4. Where in the Central Zone has the greatest degree of greenlands protection been achieved?

There can be little doubt that both the Niagara Escarpment Plan (NEP) and the Oak Ridges Moraine Conservation Plan (ORMCP)—even though the latter has been in effect for only a few months—have achieved what they set out to do; namely, to assign a protected status to a wide range of greenlands and to restrict development to low-intensity uses in very select areas. Both plans go far beyond the PPS, not only in terms of what is considered "significant," but also with respect to the type, scale, and density of development, that is considered appropriate in different portions of the Escarpment or Moraine. Furthermore, the ORMCP has raised the bar considerably when it comes to the environmental tests to which a development application will be subjected, with more generous triggers for an EIS and minimum 30-metre-wide "vegetation protection zones" surrounding the greenlands features.

The Niagara Escarpment Plan and the Oak Ridges Moraine Conservation Plan have succeeded in assigning a protected status to a wide range of greenlands and restricting development to low-intensity uses in select areas. Both go far beyond the PPS and have created physical barriers to urban sprawl to the west and north within the GTA.

Taken together, protection of the Niagara Escarpment and Oak Ridges Moraine has had, and will continue to have, a profound effect on the pattern of urban development in south-central Ontario. These two planning initiatives have effectively created a physical barrier, a northern and western limit to urban sprawl within the Greater Toronto Area.

Beyond this, many Central Ontario municipalities (such as the Region of York and the Region of Waterloo) have implemented wide-scale "greening" initiatives. These are strategic documents that endeavour to go beyond the environmental policies entrenched in an Official Plan, by fostering a conservation ethic among the residents of a municipality. Rather than focusing on maintaining the status quo with respect to greenlands, these plans promote individual and collective actions (such as tree planting, soil and water conservation, or land stewardship) that, it is hoped, will ultimately result in a net gain in forest cover.

5. Greenlands currently under threat

At present, the greatest pressure on Central Ontario's greenlands is being exerted in three areas:

1. within the existing boundaries of the Zone's most rapidly urbanizing municipalities;
2. along the shorelines of the many lakes and rivers within the Zone;
3. within areas targeted for new agricultural use, recreational development (for example, golf courses), and mineral resource (limestone and aggregate) extraction.

It is assumed that urban development will occur on land designated in Official Plans and that any greenlands within these areas will eventually disappear.

The first pressure-point is a fairly obvious one and is based on the premise that urban development will occur first on land already designated in Official Plans and that any greenlands within these areas that are not currently protected by the upper-tier Official Plan will not persist. The issue of continued urban sprawl and a discussion of those municipalities which are experiencing the greatest pressure to grow are well documented in the *Toronto-Related Complex Urban Futures Study* by the IBI Group, published in 2002. Two examples illustrating the extent of greenlands under threat within (a) a rapidly urbanizing Central Ontario municipality and (b) a largely rural municipality are provided in F**igures 2 and 3**, respectively.

The growing demand for recreational and residential ("lifestyle") development near lakes threatens coastal greenland systems.

Another immediate threat is to coastal, lakeshore and riverside greenland systems and arises from an ever-growing demand for recreational-residential development within several hours' drive of the major urban centres. This type of development is favoured by the more affluent "baby boomers" seeking a summer or weekend retreat, or "empty nesters" looking to downsize their home, move out of the city, and take up residence in an adult lifestyle community. Typically, these developments include amenities such as golf courses and marinas to support the residential component. Furthermore, the areas targeted for large-scale developments of this kind are often not located within a predominantly urban municipality or, in the case of many rural municipalities, even within a designated settlement area. Although large stretches of the shorelines of the Zone's lakes have already been developed with cottages and marinas, many of the areas that are still in a natural or semi-natural state support coastal marshes, sand dunes, beaches, glacial shorecliffs, fish spawning beds, and important woodlands. Some examples of shoreline areas that are presently experiencing development pressure of this kind include: Frenchman's Bay (Pickering), Lynde Shores (Whitby), Oshawa Second Marsh, the towns of Collingwood and Wasaga Beach, Oro Lea Beach (Oro-Medonte), Alcona (Innisfil), and Balsam Lake (Kawartha Lakes).

Figure 2: Greenlands affected by new urban growth in Brampton, a rapidly growing municipality

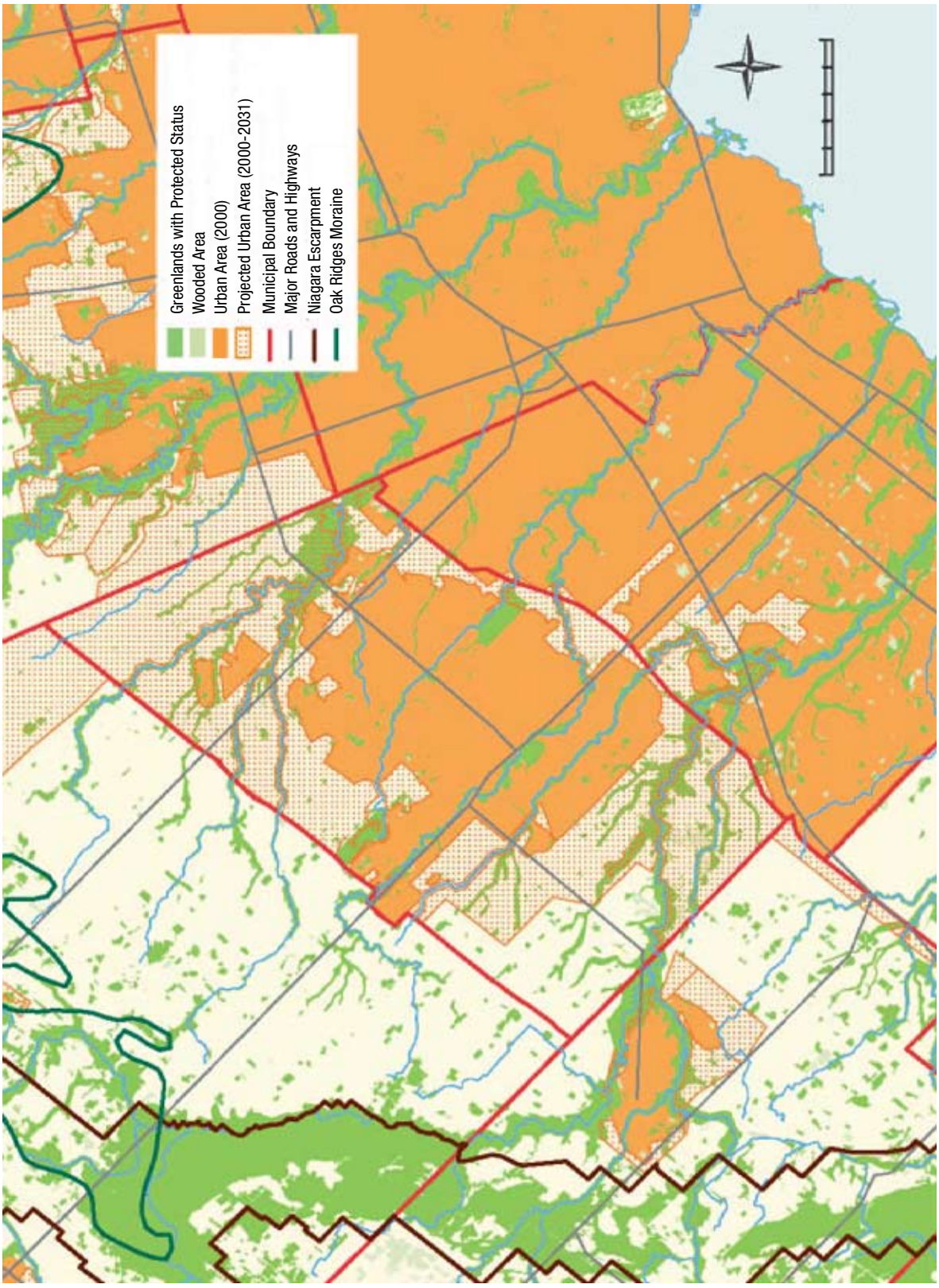


Figure 3: Greenlands affected by new urban growth in Wasaga Beach, a rural municipality

Agricultural practices are considered by some to be among the primary agents responsible for the loss and impairment of healthy, functional greenlands in the Central Ontario Zone. Wetlands are still being drained and woodlots cut down to create more agricultural land. Farmers are generally exempt from any requirement to preserve greenlands when creating new arable land. There are numerous examples throughout the Zone of areas where groundwater and surface water quality and associated fish habitat have been severely degraded by unregulated water takings, uncontrolled livestock access to watercourses, and contaminated runoff from barns. Although some farmers voluntarily adopt environmentally responsible agricultural practices, it is often the one or two poorly run operations that are responsible for the bulk of the problem at a local level. Generally speaking, however, when it comes to identifying major threats on our greenlands the agricultural community avoids scrutiny and enjoys a certain degree of immunity from criticism.

Farmers are exempt from requirements to preserve greenlands, and may drain wetlands or cut down woodlots to create new agricultural land. Some poorly run livestock operations pollute rivers with contaminated run-off from barns.

The ever-growing demand for golf courses has been partially responsible for an increase in the amount of agricultural and forested land converted to this use. Although many golf courses adopt best management practices in water conservation, turf care and pest management, a number of ancillary environmental impacts are associated with the operation of a golf course. In terms of where new golf courses are being built in this part of Ontario, there doesn't appear to be any strong geographic pattern emerging, although proximity to a large population base is undoubtedly a major business advantage. A golf course is often a permitted use within land designated as Open Space in an Official Plan and, unless associated with a residential development, is unlikely to rely on the availability of municipal services (such as sewer and water). As a rule, 18-hole golf courses occupy a minimum of 80 hectares (200 acres). For reasons of aesthetics and challenge of play, land with some topographic relief, surface water features and forest cover is favoured over flat, open areas, thereby placing more pressure on greenlands.

Recreational facilities, from golf courses to cross-country skiing and mountain biking trails often result in environmental degradation.

Other outdoor recreation facilities such as snowmobile trails, cross-country ski resorts, and mountain biking centres are gaining in popularity. These facilities require the creation of extensive trail networks that result in the human disturbance to wildlife, loss of tree cover, the introduction of invasive plants, soil compaction, increased erosion, and, most significantly, fragmentation of large forest blocks. Snowmobile trails and cross-country ski resorts tend to be located in more northerly areas subject to greater snowfall and longer winters, while both cross-country ski and mountain bike facilities need variable terrain and extensive tree cover.

New aggregate extraction operations (pits and quarries) are generally driven by two principal factors: 1) the presence of an economically viable resource and 2) proximity to a major demand area. That aggregate extraction and greenlands are conflicting land uses, at least in the short term,

Although aggregate extraction directly conflicts with the preservation of greenland features, the same provincial ministry (Natural Resources) is responsible for licensing pits and quarries and conserving natural heritage.

has long been recognized and is borne out by the way the PPS deals with each. This policy conflict is further exacerbated by the fact that the same provincial body that has jurisdiction over the licensing and operation of pits and quarries—the Ministry of Natural Resources—is also the lead agency in the area of Natural Heritage protection. Approval of a new pit or the expansion of an existing operation is often granted at the expense of a greenlands feature. The one advantage that aggregate operations have over other large-scale, intrusive land uses is that there is a requirement to rehabilitate these sites after extraction is complete, providing an opportunity to create or restore lost habitat in the long term.

New roads, particularly the multi-lane, 400-series highways, and other linear infrastructure facilities such as pipelines and hydroelectric transmission corridors can also have a profound impact on greenlands. Because these linear facilities link one area to another, the most economical method of construction is in a straight line over the shortest possible distance. This approach virtually guarantees that the preferred alignment will pass through a greenland feature at some point. Valleys are often selected for linear facilities such as sewer mains, because the disruption of agricultural or already urbanized land can be avoided. Although the routing of public utilities such as roads is subject to an Environmental Assessment under the *Environmental Assessment Act*, features such as Provincially Significant Wetlands (protected under the PPS) are not exempt from intrusion or encroachment. The approved alignment of the northeasterly extension of Highway 404 through the town of Georgina (northern York Region) crosses several such wetlands, as it was not possible to find a socially and economically acceptable route that avoided all greenlands features.

Roads, highways, pipelines, and hydro corridors often pass right through a greenland feature, creating a barrier to wildlife movement and fragmenting forests.

By their very nature, the creation of roads, pipelines and hydro corridors causes habitat fragmentation, introduces a physical barrier to wildlife movement, bisects major valley systems, and results in the partial enclosure of watercourses in culverts. There are related impacts of roads on the natural environment, such as salt runoff, noise, animal roadkills, and exhaust emissions, although these are not necessarily well understood.

The types of greenlands that are most under threat in the Central Ontario Zone are:

- tableland woodlots that have no policy status (i.e., they are not ANSIs, ESAs, or Significant Woodlands);
- unevaluated wetlands;
- intermittent headwater streams.

In rural areas, small isolated woodland patches are found scattered throughout a mosaic of agricultural fields. Because these woodlots lack protection, even in many GTA municipalities, they are viewed as future development land. On the other hand, these features may be the only

Small, isolated woodlots are often viewed as future development land, even when they are the only greenlands feature remaining in the rural landscape.

greenlands remaining on the rural landscape and, as such, are seen as strong candidates for protection by the local populace.

Contrary to popular belief, there are a great many wetlands throughout Central Ontario that have not been formally evaluated in accordance with the Provincial Wetland Evaluation System. This is particularly true on the Canadian Shield, where wetlands are so prevalent that typically only the largest, most prominent, and most easily accessible ones have been evaluated. These features also lack any protective status under the PPS. By definition, however, any wetland greater than 2 hectares meets the minimum size criterion for evaluation. Once it has been evaluated, a wetland can score no lower than Locally Significant.

Many wetland areas have not been formally identified and evaluated, and are therefore not protected.

As discussed earlier, the ecological and hydrological significance of intermittent headwater streams have traditionally been overlooked, particularly in rural areas where these features have been substantially altered by agricultural practices. Because these features drain relatively small areas and thus are not subject to fill and flood line regulations, they are often allowed to be modified or eliminated altogether through development.

Intermittent headwater streams are not subject to flood and fill line regulations and may be modified or eliminated.

6. What important ecological trends influence greenlands protection?

The previous sections of this paper have discussed some of the recent trends in development patterns and Natural Heritage planning that relate to the loss or protection of greenlands in the Central Ontario Zone. However, of perhaps equal importance are several significant scientific advances that have recently been made in the burgeoning field of landscape ecology. In the past decade we have witnessed the emergence of a number of trends that are strongly influencing the identification of greenlands as well as the policies designed to protect these features. Perhaps foremost among these is the concept of landscape connectivity: the belief that one of the keys to a healthy *system* of greenlands is the maintenance of physical habitat connectors between and among large natural core areas such as major forests, wetlands, and valleys. Connectivity has been championed by a number of influential members of the scientific community and has recently been the focus of a major research project of the Federation of Ontario Naturalists (FON) and the Nature Conservancy of Canada (NCC) known as "The Big Picture Project." Using sophisticated computer modelling, a conceptual model of landscape connectivity for Ontario south of North Bay has been developed, based on a series of several kilometre-wide connectors that criss-cross the south-central portion of the Province, linking large core areas.

One of the keys to a healthy greenlands is the maintenance of a system of connectors among forests, wetlands, and valleys to offset the instability caused by habitat fragmentation. Connectivity is one of the cornerstones of the Oak Ridges Moraine Conservation Plan.

The concept of connectivity is also one of the cornerstones of the recently released Oak Ridges Moraine Conservation Plan. The plan is intended to establish habitat connections between key natural heritage features at a more local level than the FON model, but based on the same fundamental principle that everything needs to be linked together so as to facilitate the movement of plants and animals (and in doing so promote the exchange of genetic material) over large portions of the landscape.

Although connections are important, the core greenlands areas are the anchors of the natural heritage system and should be afforded greater consideration than corridors Biodiversity cannot be maintained at current levels without large, contiguous patches of forest habitat.

There are two opposing schools of thought among ecologists regarding the merits of landscape connectivity and corridors. The prevailing argument is that corridors help offset the instability caused by habitat fragmentation. The concept of connectivity has its detractors, however, who believe that corridors provide conduits for disease, predators, and exotic species to spread through a population. Analyzing the pros and cons of this debate are beyond the scope of this paper. On balance, the merits of corridors, especially between core natural areas, outweigh their detrimental aspects, but they should not be viewed as a "cure-all" to counter the ills of habitat fragmentation.

It is important to remember that the purpose of establishing and maintaining landscape connectivity is to support the core greenland units. Core areas are the anchors of the natural heritage system and should be afforded greater consideration than corridors. Research into the dynamics of wildlife communities inhabiting some of these larger forest patches is revealing a disturbing trend. Rather than being population "sources," many of these forests may instead be acting as "sinks," exhibiting surprisingly poor productivity given their relatively large size. On an ecological basis, there is a tendency to overestimate the value of these forest patches as habitat. Ecologists are gradually discovering that some of the animal species one would expect to find in large forest patches are in fact absent, or present in small numbers and non-productive.

Reforestation to close gaps and smooth out the edges of large areas of core woodlands would be more cost-effective than attempting to construct new corridors. Restoring a single hectare of forest could potentially result in six hectares of forest interior habitat.

One of the practical disadvantages associated with re-connecting the landscape is that it can be extremely expensive to construct, even when some of the links in the chain (such as small woodland patches between larger forest blocks) are already in place. With limited financial resources available, it is questionable whether investments of this magnitude will achieve the best return. In the view of some, habitat restoration to close gaps and smooth out the edges of large core areas would be more cost-effective and ecologically sustainable. A recent analysis of the state of forest cover in the former Region of Hamilton-Wentworth (now the City of Hamilton) demonstrated that restoring a one-hectare forest gap could, in some situations, result in the creation of up to six hectares of forest interior habitat. Biodiversity cannot be maintained at current levels or expected to return to former levels without the existence of large, contiguous patches of natural habitat. In many cases this will require a commitment to undertaking habitat restoration (that is, creating more habitat), rather than merely maintaining the existing level of available habitat.

7. Key elements of a smart growth strategy

The adoption of a Smart Growth strategy should favour the protection of greenlands, because the underlying principle of more compact, sustainable communities is predicated on the more efficient use of land, lowered reliance on automobiles, wise use of water and energy, and the protection of natural areas. The typical structure of many of our present-day communities—land-consumptive, resource-consumptive, with a high degree of dependency on automobiles and limited protection of natural areas —would seem to represent the antithesis of the Smart Growth vision.

The underlying principle of more compact, sustainable communities is predicated on the more efficient use of land, less reliance on automobiles, wise use of water and energy, and the protection of natural areas.

In practice, however, it will be difficult to achieve greater protection of greenlands as part of a Smart Growth Strategy without making major improvements in the following four areas:

- identification;
- delivery;
- securement;
- management.

7.1 Identification

With tools such as Geographic Information Systems (GIS) and ecosystem modeling readily available to both ecologists and planners, we are better equipped than ever before to identify those features that constitute greenlands. In addition, our understanding of greenlands function has grown from a consideration of largely abstract concepts to a genuine appreciation of its importance. Nevertheless, some of the PPS Natural Heritage definitions of what constitutes "significant" or "no loss" or even what a woodland is are too ambiguous and need tightening. Politicians, land use planners, developers, and perhaps most importantly, members of the Ontario Municipal Board, need a clear and consistent set of definitions. Too often nowadays the onus is placed on OMB members, who are not experts in landscape ecology, to interpret Natural Heritage policy that addresses complex scientific issues in an overly simplistic way. This invariably leads to inconsistency in the way the PPS is interpreted and applied.

Some of the PPS Natural Heritage definitions of what constitutes "significant" or "no loss" or even what a woodland is are too ambiguous and need tightening. Too often nowadays the onus is placed on OMB members, who are not experts in landscape ecology, to interpret Natural Heritage policy that addresses complex scientific issues in an overly simplistic way.

Although the PPS has been in existence for seven years, there are still some Official Plans, particularly in rural municipalities outside the GTA, where consideration of the natural environment still relates to the identification and avoidance of "hazard lands" such as flood prone areas, steep slopes, and organic soils that pose physical (as opposed to ecological) constraints to development. The other extreme is found in OP policies that embody the PPS in every respect, but give little or no recognition to those greenlands elements that are significant and worthy of protection at a regional level.

One oft-heard criticism of the natural heritage policies of the PPS is that the definitions are too vague and lacking in specifics. By comparison, the regulations related to natural heritage protection contained in the Oak Ridges Moraine Conservation Plan are highly prescriptive. Because of ambiguity surrounding the basic definitions of what constitutes a "significant" feature (such as seepage areas, valleylands, or wildlife habitat), which are subject to different interpretations, it is still unclear what the Plan intends to protect under the umbrella of Key Natural Heritage Features (KNHFs) and Hydrologically Significant Features (HSFs). Although the Ministry of Natural Resources has produced a series of draft technical memoranda designed to help interpret the natural heritage aspects of the plan, to date the Province has not officially sanctioned or approved these documents. More than a year after the Plan came into effect, there is still some uncertainty and lack of clarity as to how, where, and under what circumstances the specific provisions of the Plan should be applied.

Because of ambiguity about what constitutes a "significant" feature (e.g., seepage areas, valleylands, wildlife habitat), it is unclear what the Oak Ridges Moraine Conservation Plan intends to protect under the umbrella of Key Natural Heritage Features and Hydrologically Significant Features.

7.2 Delivery

At the provincial level, consideration should be given not only to changing some aspects of the PPS Natural Heritage policies, but also to our current method of delivering greenlands protection in Ontario. At present, the Province is responsible for setting policy and municipalities are responsible for its implementation. Because the ministries of Natural Resources and Environment no longer participate in plan review, in the Central Ontario Zone (and elsewhere) the role of providing environmental expertise to municipalities has primarily been taken over by conservation authorities.

Now that the ministries of Natural Resources and Environment no longer participate in plan review, conservation authorities are expected to provide environmental expertise to municipalities. Some conservation authorities have considerable resources, while others are underfunded and understaffed.

Conservation authorities within the Central Ontario Zone have adopted different approaches to delivering greenlands protection. Depending on their location and the population base of their watersheds, some conservation authorities have considerable financial and personnel resources, while others are underfunded and understaffed. Furthermore, because the conservation authorities are managed by boards made up of elected officials, they can become political and their decisions may be influenced by individual agendas rather than purely technical grounds. These differences have led to a lack of consistency in applying greenlands policy when land development proposals are being reviewed. As a result, the process is neither fully transparent nor sufficiently accountable.

For example, large, powerful conservation authorities like the Toronto and Region Conservation Authority are able to limit development from occurring in areas that are arguably low-quality greenlands (which shifts pressure onto higher-quality areas), while outside the Greater Toronto Area, smaller, less powerful conservation authorities are unable to exert much influence on where and how development occurs.

Outside the GTA, some of the smaller, less powerful conservation authorities are unable to exert much influence on where development occurs.

As part of a provincial Smart Growth Initiative, some consideration should be given to reforming the current method of greenlands policy delivery in Ontario. Some suggestions as to the kinds of changes that could be brought about in this regard are elaborated in the Recommendations section of this paper.

7.3 Securement

One of the major stumbling blocks to greenlands protection is the issue of land acquisition, specifically what areas should be obtained, by whom, and for what purpose. A number of land trusts in Ontario share a common goal of securing significant natural areas, either through direct purchase or various land stewardship mechanisms. Some organizations, such as the Nature Conservancy of Canada and the Ontario Heritage Foundation, have a fairly broad protection mandate; others, such as the Oak Ridges Moraine Land Trust and the Couchiching Conservancy, concentrate their efforts on land acquisition and stewardship in select geographic areas. Some are well funded, relying on the benevolence of the public through donations and bequests. Others operate at a more grass-roots level, working directly with individual landowners to conserve significant natural areas or restore degraded ones. Historically, there has always been a limited amount of money available in public coffers to purchase significant greenland areas, but this situation will have to change if we expect to secure or expand extensive tracts of core greenlands in perpetuity.

There has always been a limited amount of money available in public coffers to purchase significant greenland areas, but this situation will have to change if we expect to secure or expand extensive tracts of core greenlands in perpetuity.

Greenlands acquisition and stewardship by private agencies is largely an opportunity-driven exercise that takes place when a parcel of land becomes available. Assuming the price is right, the land is either purchased outright by the agency or a conservation easement or management plan is negotiated with the landowner. However, this form of securement tends to occur somewhat randomly, rather than as part of an overall plan.

Some ideas as to how greenlands securement can be improved through smart growth are presented in the Recommendations section.

7.4 Management

A shift in public attitude regarding how we manage the various elements of our greenlands systems will also have to take place if we are to adapt to smaller, self-contained communities with higher population densities. The realization is gradually taking hold that the ecosystems of Central Ontario have been so severely corrupted by fragmentation, invasive and exotic (non-native) species, and the cumulative effects of several centuries of human occupation, that they can no longer be expected to function without concerted, long-term management. The notion that most greenlands

The ecosystems of Central Ontario have been so corrupted by fragmentation, invasive species, and the effect of several centuries of human occupation that they can no longer be expected to function without concerted management. The notion that greenlands can be protected in perpetuity simply by leaving them alone is shortsighted.

can be protected in perpetuity simply by leaving them alone is short-sighted. In many cases the maintenance of viable ecosystems is possible only with human intervention. This has huge implications for the long-term protection and integrity of greenlands, as there does not yet appear to be sufficient recognition of this trend to bring about a shift in focus toward the active management of these areas.

Although the slogan "Think globally, act locally" provides the individual with a "feel-good" sense of having made a difference, it fails to promote an understanding of the bigger, more serious issues. We need to start thinking in terms of larger-scale actions.

The expression "Think globally, act locally" has often been touted as a philosophy each individual should adopt to achieve and maintain a healthy, sustainable environment. Local actions such as painting yellow fish beside storm sewers or planting native species in one's backyard are highly commendable, but unfortunately do not go far enough. The idea that solutions to large-scale environmental problems can be achieved by promoting action at a local level is naïve. Although this approach provides the individual with a feel-good sense of having made a difference, in reality it often fails to promote an understanding of the more serious big picture issues. To maintain the long-term viability of our provincial greenlands system in perpetuity, we need to commit now to the implementation of concerted and sustained management actions aimed at reversing the impacts of human intrusion. Although this shift in attitude may already be under way, it must be accompanied by a political commitment to devoting more resources to the management of existing greenlands areas.

8. What are the major barriers to implementing change?

The goal is not "protect anything that is green." Not all greenlands are created alike, and different greenlands have different values.

Among the greatest barriers to achieving an equitable and consistent level of greenlands protection through Smart Growth are public attitudes and perceptions. Simply put, most people are motivated by self-interest and generally concerned primarily with those things that have a direct affect upon them.

Particularly in rapidly urbanizing areas, where greenland features may be few and far between, the prevailing attitude is often one of "protect anything that is green." The implication is that it must be valuable because it is in such short supply. However, the flaw in this argument is that the distinction between an area's intrinsic ecological value and its social or aesthetic value becomes blurred. The public or politicians may place a very high value on retaining a small, already degraded woodlot in an urban area, while a highly sensitive and rare fen wetland community in a remote corner of Haliburton County could be destroyed and no one would either know or care. Clearly, from a purely ecological perspective, the fen is the more valuable of the two, even though the land itself may have a very low value as a piece of real estate. Throughout much of Central Ontario, important greenland features are being lost because they are simply not on anyone's radar screen. By comparison, many of the battles for greenlands protection are waged in a confrontational and litigious atmosphere, consuming considerable amounts of time and money. Situations such as these place undue emphasis on the preservation of marginal, often degraded greenlands in populated areas at the expense of high-functioning ecosystems in more remote areas.

Throughout much of Central Ontario, significant greenland features are being lost simply because they are not on anyone's radar screen, while marginal, degraded greenlands are the subject of expensive, time-consuming litigation.

It is also very difficult to protect well-functioning greenlands if we continue to promote the notion that many of our natural areas, particularly in heavily populated areas, need to be accessible to the public. Municipalities will often go to great lengths to ensure that significant natural areas are brought into public ownership and then will require that trails be built through them. This invariably results in a conflict between the goal of conservation and that of providing recreational opportunities, usually resulting in the loss of ecological function over time.

Millions of dollars are spent on lengthy OMB hearings, even though there is no certainty that such hearings will contribute to greenlands protection.

The question of how we will pay for the necessary changes in greenlands identification, policy delivery, securement, and management, as well as who will be responsible for their implementation, is always a perplexing one. A simplistic response is that all of us need to contribute our fair share, and if that means raising our taxes to pay for it, so be it. When it comes to greenlands protection, there is no question that money could be spent much more wisely than it is presently. One need look no further than our legacy of spending millions of dollars on lengthy and often emotionally

charged Ontario Municipal Board hearings, with no certainty as to their outcome or that the natural environment has been well served at the end of the day. As part of the overall Smart Growth strategy, a full accounting of costs versus environmental benefits should be undertaken to determine how we can best allocate our limited financial resources to achieve cost-effective solutions.

9. Recommendations

The following recommendations could be implemented as part of a Smart Growth Strategy to better identify, protect, and manage the greenlands of the Central Ontario Zone. These include measures that could be acted upon over the next several years, as well as actions that could be considered over the longer term. These recommendations are grouped under the four elements of a Greenlands Smart Growth Strategy discussed above: identification, delivery, securement, and management.

9.1 Identification

Provincial policy statement five-year review

In the context of the five-year review of the Provincial Policy Statement, the Province should consider treating woodlands and wildlife habitat like wetlands, and implement a standard protocol for identifying and classifying these features across Ontario.

The Provincial Policy Statement came into effect in 1996 and is currently undergoing a five-year review, as required under the Planning Act. This review provides an ideal opportunity to embody the principles of Smart Growth within an updated PPS, including those related to natural heritage protection. There is a push under way to give the environment a stronger focus and to refine and elaborate on natural heritage policies, without becoming overly prescriptive.

The two areas in which the PPS could provide clearer direction are in the identification and protection of Significant Woodlands and Significant Wildlife Habitat, both of which are municipal responsibilities. As noted, these features are rarely identified or addressed by policy in Official Plans. Where they have been considered, a definition of what constitutes "Significant" has not been applied consistently across Central Ontario.

Recommendation #1: The Province should treat woodlands and wildlife habitat in a similar fashion to wetlands, and develop and implement a standard protocol for identifying and classifying the most significant of these features across Ontario. This will provide municipalities with a set of consistent and scientifically defensible criteria that can be applied to identify where these features occur within a given jurisdiction.

No distinction should be made between wetlands on the Canadian Shield and those to the south and east.

Recommendation #2: From the perspective of greenlands protection, there should be no distinction made in the PPS between Provincially Significant Wetlands that occur on the Canadian Shield and those that lie to the south and east of the Shield. The Province should revise the PPS so that significant wetlands in on and off the Shield are treated in the same manner and accorded the same level of protection, regardless of geographic location. One possible approach might be to establish a higher point-score threshold (for example, 700 points out of 1,000, as opposed to the current 600) for Provincially Significant Wetlands on the Canadian Shield.

Wetland Evaluations

Recommendation #3: The Province should actively promote further wetland evaluations and definitive mapping of these features in areas of Central Ontario (especially outside the GTA) where these studies have not been consistently carried out for a decade or more. This will provide a greater degree of certainty with respect to the locations of these features and help fill an existing policy gap.

9.2 Delivery

Role of the Ministries of Natural Resources and the Environment, and of conservation authorities

One of the major obstacles to greenlands protection in the Central Ontario Zone is that responsibility for various aspects of the environment resides with two different provincial ministries (Natural Resources and Environment) and conservation authorities. This contributes to a situation in which there is a distinct lack of coordination and consistency in how provincial and municipal Natural Heritage policies are applied across the province.

Recommendation #4: As a key element of a Smart Growth Strategy, the Province should seriously consider amalgamating the Ministry of Natural Resources, the Ministry of the Environment, and the conservation authorities into a single administrative body (a "super ministry" patterned along the lines of the United States Environmental Protection Agency) with responsibility for managing all facets of the natural and physical environment.

Responsibility for the environment resides with two provincial ministries (Natural Resources and Environment) and conservation authorities. This contributes to a lack of coordination and consistency in how provincial and municipal policies are applied.

Recommendation #5: As part of a Smart Growth Strategy, the Province should undertake a complete re-evaluation of the entire plan review process, especially the roles of the Province, municipalities, and conservation authorities. Consideration should be given to the idea of producing a Central Ontario Zone Plan that knits together the existing Official Plans into a linked and coherent vision of what this portion of the Province is intended to look like well into the future. From a greenlands perspective, this exercise should clearly identify those areas that deserve protection and provide an ultimate vision of what the natural heritage system of Central Ontario should look like 100 years from now that is not simply driven by patterns of growth or demographics.

Role of the Ontario Municipal Board

Nowadays it seems that too many of the planning decisions in the Central Ontario Zone are being made by the Ontario Municipal Board. We need to explore means of ensuring that the land use designations in an Official Plan have some real status and some degree of permanence over the life of the Plan.

Recommendation #6: The Province should take a meaningful look at ways to break the trend of "Planning by Official Plan Amendment." This may mean limiting the ability of a proponent to refer a planning decision or application to the Ontario Municipal Board with the intent of changing the designations under the Official Plan, particularly those that relate to greenlands.

A Central Ontario Zone Plan could knit together the existing Official Plans into a linked and coherent vision of what this part of the Province is intended to look like well into the future.

Realistic timelines for implementation

Municipalities need to be given incentives to bring their Official Plans into conformity with the Provincial Policy Statement, not strict deadlines. Furthermore, effective conformity is required in these documents, not just lip service. The Oak Ridges Moraine Conservation Plan contains provisions that require municipalities to adopt the plan and begin the preparation of comprehensive watershed conservation plans within one year, but provide little technical guidance in this regard.

Recommendation #7: The Province should take a strong leadership role in encouraging municipalities to prepare watershed conservation plans, but with clearer direction and within realistic timelines. Otherwise there is a very real risk that the quality of the end product will suffer and that bad planning decisions will ensue. If this initiative results in the proliferation of a large number of inadequate watershed plans, then we may be better off with no plans at all.

Too often, policies are formulated and decisions made in a purely reactive way.

Proactive planning

Another prevalent aspect of natural heritage planning is that too often policies and regulations are formulated and decisions made in a purely reactive way. The Oak Ridges Moraine Conservation Plan is a classic example of this type of planning response. It is imperative that future policy direction evolves proactively and addresses major policy gaps such as greenlands acquisition and long-term management.

Recommendation #8: As part of a Smart Growth Strategy, the Province should encourage municipalities to expand traditional planning horizons from the 15-20 year range out to the 30-50 year range and beyond, because the time scale required to establish and maintain a healthy greenlands system is measured in multiple human generations.

9.3 Securement

Many different organizations work to acquire land for preservation. More could be accomplished if a central body was given responsibility for coordinating the various acquisition and stewardship initatives currently under way. Given the high real estate value of many core greenlands, it would make sense to pool the available resources and expertise.

Land trusts and stewardship

Although the different approaches to greenlands acquisition and stewardship that are currently being undertaken in Central Ontario generally lead to positive results, far more could be accomplished if a central body was responsible for these initiatives. Given that the real estate value of Central Ontario's core greenlands is much higher than the money available for their acquisition, consideration should be given to the idea of pooling both

the financial resources and the collective expertise within both government and non-government organizations.

Recommendation #9: The Province should take a leadership role in the administration and co-ordination of greenlands acquisition and stewardship. This could include expansion of the Managed Forest Tax Incentive Program and Conservation Land Tax rebate programs to provide further inducements to landowners to protect and manage privately-owned greenlands. One of the potential negative consequences of this action is that it may meet with some resistance from municipalities, who stand to lose some much needed tax revenue if the rebate program is expanded.

Recommendation #10: The Province should expand the Natural Heritage policies of the PPS to promote the protection of ANSIs beyond those that have merely been identified as Provincially Significant. Under the current system, only the best examples in an MNR Site District are protected and many other fine examples worthy of protection are not included.

9.4 Management

Woodland restoration

Recommendation #11: Priority core woodland areas in need of active rehabilitation and restoration should be identified through partnerships among the Ministry of Natural Resources, municipalities, and conservation organizations. The intent of this initiative should be to replant gaps in the forest canopy of large core woodlands to counteract fragmentation, increase the size of core natural areas, and create healthier ecosystems. One of the major advantages of this approach is that it will pay immediate ecological dividends. Even though it will take a long time for mature forest to re-establish itself, this initiative is relatively easy to implement and will achieve a good return on investment.

Priority core woodland areas in need of active rehabilitation and restoration should be identified so that gaps in the forest canopy of large core woodlands can be replanted, fragmentation can be counteracted, the size of core natural areas can be increased, and healthier ecosystems can be created.

Ecological vs. social value of greenlands

Most greenlands are recognized as having both intrinsic ecological values and extrinsic social or aesthetic values. Until now, the prevalent policy direction has been to embrace both sets of values under one greenlands banner by promoting recreational use in significant natural areas.

Recommendation #12: A future Smart Growth Strategy should disentangle the concept of ecological value from that of social benefit, ensuring that protection is the priority in key natural areas, while in other, less sensitive, areas the focus can be placed on human uses such as passive recreation. We need to recognize that the two concepts are not always compatible and to know with certainty what kind of greenlands values (ecological or social) we are dealing with in deciding the future disposition of specific areas. Future policy needs to recognize that we need green spaces for social and

There is a difference between greenlands used for social or aesthetic reasons and those that serve an ecological function and greenlands policies should reflect that difference.

aesthetic reasons, as distinct from those areas that should be protected because they possess a high degree of ecological function. This fundamental distinction needs to be clearly translated into Official Plan documents.

Priority areas for protection

One of the strategic approaches associated with future greenlands planning should be to focus on the identification and protection of core natural areas that span a large geographic area (such as the Oro Moraine or the Carden Plain). This provides an opportunity to put the planning "rules" governing greenlands protection in place well in advance of an untenable planning conflict. This is one of the lessons we could learn from the experiences of the Niagara Escarpment and Oak Ridges Moraine: to anticipate future development pressures in a given area and respond in a proactive fashion to avert crisis and controversy. These are also opportunities to plan beyond conventional short-range (10-to-15-year) time horizons.

One of the lessons we could learn from the Niagara Escarpment and Oak Ridges Moraine experience is to anticipate future development pressures in a given area and respond proactively to avert crisis.

A number of key greenlands areas in the Central Ontario Zone should be made priorities for securement and long-term protection. These have been identified because they satisfy one or more of the following criteria:

- they are large, intact, and relatively undisturbed (natural core areas);
- they are under immediate threat;
- they are largely unprotected at present;
- they represent a mix of forest, grassland, wetland, and landform features;
- they represent unique or highly sensitive ecosystems that are poorly represented in the Zone.

Recommendation #13: The future vision of the Central Ontario Zone should include protection of large portions of key greenland areas that meet all or some of the criteria above. The large greenland areas on the following preliminary (but not exhaustive) list, some but not all of which are experiencing development pressure, are already recognized as being ecologically significant. These areas would appear to be prime candidates for ongoing and future protection and management at a broad landscape level:

Large, relatively undisturbed greenlands features that are under immediate threat and that represent unique or highly sensitive ecosystems should be protected. They should be identified in planning documents as requiring protection, should be secured from develoment where possible, and should be the focus of management plans.

- **Oro Moraine (Simcoe)**
- **Midland Peninsula (Simcoe)**
- **Carden Plain (Kawartha Lakes)**
- **Lake Iroquois Beach (Durham/Northumberland)**
- **Peterborough Drumlin Fields**
- **Rice Lake Plains (Peterborough/Northumberland)**

Some of these areas are already the focus of active land acquisition initiatives, which should continue. The ultimate objective should be to identify these areas in future planning documents, secure as much of the land as

can be reasonably obtained through purchase or stewardship agreements, and develop a management plan for the area that can be implemented so that these areas are largely committed for greenlands protection and set aside well in advance of future development pressures.

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Appendix A: Definitions of Central Ontario greenlands

Greenland Type	Definition
Provincially Significant Wetland (PSW)	A wetland is land that is seasonally or permanently covered by shallow water, as well as lands where the water table is close to or at the surface. In either case, the presence of abundant water has caused the formation of hydric soils and has favoured the dominance of hydric plants or water-tolerant plants. The four types of wetlands are swamps, marshes, bogs and fens. A significant wetland is one that is identified as provincially significant by the Ministry of Natural Resources. Specifically, it is any wetland that: I) achieves a total score of 600 or more points, or 2) achieves a score of 200 or more points in either the Biological component or the Special Features component in the Ontario Wetland Evaluation System. A wetland is also considered a PSW if it has previously been evaluated under the first and second edition of the Ontario Wetland Evaluation System as Class 1, 2, or 3.
Locally Significant Wetland	A wetland that is evaluated under the Ontario Wetland Evaluation System, but is not considered provincially significant (scores lower than indicated above).
Unevaluated Wetland	A wetland that has not been evaluated using the Ontario Wetland Evaluation System.
Significant Portions of Habitat of Endangered and Threatened Species	An endangered species, as defined by the provincial Ministry of Natural Resources, is any native species that, on the basis of the best available scientific evidence, is at risk of extinction or extirpation throughout all or a significant portion of its Ontario range if the limiting factors are not reversed. A threatened species is any native species that, on the basis of the best available scientific evidence, is at risk of becoming endangered throughout all or a significant portion of its Ontario range if the limiting factors are not reversed. A significant portion of the habitat of one of these species refers to the habitat that is necessary for the survival of populations of endangered and threatened species.This is determined on a case-by-case basis.
Fish Habitat	The spawning grounds and nursery, rearing, food supply, and migration areas on which fish depend directly or indirectly in order to carry out their life processes.
Significant Woodland	Woodlands are treed areas that provide environmental and economic benefits such as erosion prevention, water retention, provision of habitat, recreation and the sustainable harvest of woodland products. Significance is based on meeting suggested standards for one or more of the following factors: woodland size, ecological functions (shape, proximity, linkages, diversity), uncommonness in the landscape (in terms of age, composition, cover type, quality, age structure), or economic and social values. For woodlands within the Oak Ridges Moraine Planning Area more precise definitions are currently being developed. Responsibility for the identification of Significant Woodlands rests with the planning authority (usually a municipality).
Significant Valleylands	Valleylands are natural areas that occur in a valley or other landform depression that have water flowing through or standing for some period of the year. For valleylands within the Oak Ridges Moraine Planning Area, more precise definitions are currently being developed. Responsibility for the identification of Significant Valleylands rests with the planning authority (i.e., municipality).
Significant Wildlife Habitat	Wildlife habitat is identified as areas where plants, animals, and other organisms live, and find adequate amounts of food, water, shelter, and space to sustain their populations. Specific wildlife habitats of significance may include areas where species concentrate at a vulnerable point in their annual cycle; and areas that are important to migratory and non-migratory species. It is considered significant if it is ecologically important in terms of features, functions, representation, or amount, and contributing to the quality and diversity of an identifiable geographic area or Natural Heritage System. Criteria for determining significance may be recommended by the Province, but municipal approaches that achieve the same objective may also be used.

Greenland Type	Definition
Area of Natural and Scientific Interest (ANSI)	Areas of land and water containing natural landscapes or features that have been identified by the Ministry of Natural Resources) as having life science or earth science values related to protection, scientific study, or education. ANSIs are either Life Science or Earth Science.
Provincially Significant ANSI	A provincially significant ANSI is one that is identified as provincially significant by the Ministry of Natural Resources using evaluation procedures established by the province.
Regionally Significant ANSI	A regionally significant ANSI is any ANSI that is not identified as provincially significant by the Ministry of Natural Resources.
Environmentally Significant Area or Environmentally Sensitive Area (both referred to as ESA)	A natural area identified by a municipality or conservation authority as fulfilling certain criteria for ecological significance or sensitivity. ESAs, regardless of type, tend to be treated in much the same manner from a policy perspective. In some cases, a region will assign policy associated with the ESA.
Conservation Area	Areas in southern Ontario owned by conservation authorities that are open to the public and are maintained for recreation, natural heritage preservation, and water control purposes.
Escarpment Natural Area	Within the Niagara Escarpment Plan area, Escarpment Natural Area is the most protected of seven land use designations, each of which has its own objectives, criteria for designation and permitted uses. The objectives of Escarpment Natural Area are to: maintain the most natural Escarpment features, stream valleys, wetlands and related significant natural areas and associated cultural heritage features; to encourage compatible recreation, conservation and educational activities; and to maintain and enhance the landscape quality of Escarpment features.
Provincial Park	Provincial Parks are areas of land and water managed for the benefit of present and future generations and dedicated to the people of Ontario and others who may use them for their healthful enjoyment and appreciation.The goal of the Provincial Park system is to provide a variety of outdoor recreation opportunities, and to protect provincially significant natural, cultural and recreational environments, in a system of Provincial Parks.
Old Field and Successional Habitats	Natural habitats that in the recent past were used for agriculture or other high intensity human uses.These lands are now either lightly or not used for human activity, and although they may change from one habitat type to another (e.g., abandoned field to thicket), they provide valuable habitat for plants and animals.There are often no policy considerations specifically related to these habitats, although they may be captured under Significant Wildlife Habitat.

Appendix B: Glossary of technical terms

Terms	Definition
Aggregate deposits	A collection of mineral substances used as construction material (gravel, sand, or rock).
Best Management Practices	Proven design, construction and management techniques and approaches designed to avoid or minimize impacts on the environment.
Biodiversity	The richness of biological variation, ranging from the species level to the community level.
Canadian Shield	An ancient geological feature characterized by the worn-down surface of bedrock dating from the Precambrian era.
Catchment area	The area from which a surface watercourse (creek or river system) derives its water.
Conservation Authority	A government agency responsible for water and land management activities (such as flood protection, natural area protection, or outdoor education and recreation) within a particular watershed.
Conservation easement	A portion of private property over which access is granted to another party (for example, to a public agency to allow for inspection or maintenance or to a trail association to allow people to cross).
Cultural Thicket	A vegetation community originating from or maintained by human influences, characterized by less than 10% tree cover and greater than 25% tall shrub cover.
Dune	A low hill or ridge of sand sorted and deposited by wind.
Ecological functions	Natural processes that living and non-living environments perform within or between species, ecosystems, and landscapes.
Environmental Impact Study (EIS)	A study assessing the potential effects of a proposed development or change in land use on a natural area.
Fen	A rare wetland type characterized by peat and nutrient-rich waters, primarily vegetated by low shrubs and grasses.
Fish habitat	Spawning grounds as well as nursery, rearing, food supply, and migration areas on which fish depend directly or indirectly for their survival.
Flood and fill regulations	Regulations imposed by a conservation authority that restrict the construction of any structures or the placement of earth fill within areas (usually associated with the shorelines of lakes or the bottoms of valleys containing a watercourse) that are subject to flooding under major storm events.
Forest interior habitat	Portions of large woodland areas that are situated at least 100 metres from the edge of the forest in all directions. Forest interior provides critical breeding habitat for a number of bird species.
Moraine	A prominent physiographic feature (usually a broad ridge of land) comprised of a mix of silts, sands, and gravel that was deposited during the last glacial episode.
Neotropical breeding birds	Bird species that winter in Central and South America and breed in temperate climates, including Ontario.
Old field	An early successional vegetation community composed of scattered trees and shrubs that has regenerated from abandoned agricultural land.
Ontario Municipal Board	An independent and impartial adjudicative tribunal appointed by the Government of Ontario that listens to the appeals and concerns of individuals, public bodies, or corporations who object to the decisions of public or approval authorities such as local or regional councils, committees of adjustment, land division committees, the Minister of Municipal Affairs and Housing, or an expropriating authority. The Board holds public hearings throughout the province.

Terms	Definition
Seepage	The slow movement of groundwater just beneath the surface of the soil, which emerges at the surface to form wet patches of ground. Seepage areas often occur on the side or at the base of a slope.
Sink	An area of habitat within which species are present and breeding, but in which they are unable to produce enough offspring to be self-sustaining.
Source	An area of habitat that supports wildlife species capable of producing enough offspring to exceed the mortality of the adults (that is, they are able to produce enough offspring to be self-sustaining.