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Fostering Collaboration Among Stakeholders in Sustainable Landscape Planning in Southern Ontario

A discussion paper for the Stewardship Network of Ontario

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The Stewardship Network of Ontario (SNO) is pleased to present this discussion paper that contains a wide range of information and opinion. As such it cannot, and does not represent the position of either SNO or its member organizations. Rather, SNO hopes that this paper will encourage the discussions and partnerships that we need to have in order to achieve sustainability.

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EXECUTIVE SUMMARY

Numerous factors contribute to the challenge of natural ecosystem and agricultural landscape protection. Environmental problems, including habitat loss and fragmentation, the spread of exotic invasive species, impacts from chemical pollutants, and climate change, continue to threaten the resiliency of the southern Ontario landscape despite the repeated call to protect fundamental ecosystem processes. Protection of these processes protects biodiversity and benefits both rural and urban communities. Biodiversity contributes substantially to many vital ecosystem services, thus the protection of natural ecosystems is vital to achieving a sustainable economy and society. To achieve a sustainable landscape, basic thresholds for ecological functions need to be met and common ground on land-use must be found. Sustainable landscape planning offers an opportunity to resolve many of the issues discussed in this paper. A sustainable landscape must integrate and reconcile the needs of each stakeholder group to achieve a balance that can persist over the long term.

Numerous quantitative targets and thresholds for land cover, such as forest, wetland, and riparian vegetation cover, have been created based on scientific principles and models to assist in land use planning decisions and natural heritage system design. Targets and thresholds provide explicit goals that quantify the minimum amounts of an ecological resource to be conserved. Targets can be set at various scales, ranging from global to local, and can thus be relevant and applicable to different socio-ecological conditions. Despite some opposition to the use of targets and thresholds in sustainable landscape planning, they continue to be used to provide flexible options upon which planners and stakeholders can base their negotiations and decisions.

Target and threshold-based approaches typically used in sustainable landscape planning exercises have largely focused on conservation, with less attention paid to the economic and/or social components of sustainability. Targets and thresholds must, however, be viewed in conjunction and balanced with other priorities for sustainable landscape planning. Approaches used to date have led to some success in mitigating environmental problems; however, a lack of collaboration has often led to disparate efforts, which can result in differing viewpoints among stakeholders. Important outcomes have been achieved through multi-stakeholder initiatives at local scales. Through combined efforts, incremental steps toward a sustainable southern Ontario landscape will be made.

Stewardship is about people, extension, incentives, education, but perhaps most importantly it is a people process based on trust. Through collaboration, social-networks and social-marketing directed by stewardship and conservation communities, ideas are spread and eventually become accepted. In terms of stewardship outreach, success may be measured by the number of Ontarians who understand that the current landscape is unsustainable. Targets and thresholds play an important role in communicating this message. Furthermore, achieving support for agreed upon targets and thresholds through individual stewardship actions or by other means, invariably fosters support for planning initiatives that protect natural heritage and a sustainable landscape. Such support will contribute to facilitating a community-based process for achieving a sustainable landscape.

This discussion paper synthesizes existing information on the topic of sustainable landscape planning with the view to improve collaboration and social-learning among stakeholder groups in the southern Ontario context. The following discussion topics are reviewed as they relate to sustainable landscape planning:

Targets and Thresholds
- the use of targets and thresholds in sustainable landscape planning
- setting realistic targets and thresholds
- scale to apply targets

Agriculture
- increasing natural cover in agricultural areas
- sustainable forestry as an alternative to agriculture
- agriculture and natural heritage system planning

Rural Communities
- repercussions of rural sprawl
- dispelling the myth of a dying rural economy
- rural land owner concerns

Stewardship Approaches
- land acquisition as a tool for achieving local targets
- agriculture-minded stewardship programs

Sustainable Landscape Planning Considerations
- climate change as common ground
- community-based sustainable landscape planning
- incentives for ecosystem goods and services
- lessons from grassroots community-based coalitions

A brief review of targets and thresholds literature is provided in Appendix 2, a review of selected ecological initiatives is provided in Appendix 3, and a review of selected agricultural initiatives is provided in Appendix 4. Appendix 5 provides summaries of six case studies that highlight collaborative approaches to stewardship across southern Ontario. The purpose of this discussion paper is to identify and elaborate on a series of 'discussion points' to generate dialogue both within the Stewardship Network of Ontario (SNO), and between SNO partners and external groups. It is hoped that discussion will promote a common understanding of what sustainable landscape planning represents, and the opportunities and challenges it presents.

"The Stewardship Network of Ontario believes that a sustainable landscape is more than a preservation zone. It is a working landscape that includes working productive farmland, viable rural livelihoods and urban development that is within the capacity of the surrounding landscape to sustain it. It includes a green infrastructure that supports our quality of life with ecological goods and services such as clean air, abundant potable water, fertile soil, pollination by native insects, climate moderation, etc. The Stewardship Network of Ontario's working assumption is that we can do a better job of sustaining the ecological goods and services that we derive from the land if we focus our efforts and work together toward common goals and targets" (SNO 2010)

1.0 INTRODUCTION

Rural communities consist of many stakeholders, which include conservation organizations, farmers, non-farm rural landowners, aggregate industry, forestry, and more. In southern Ontario the largest land area is, by far, in agriculture. The focus of this discussion paper is on achieving a more sustainable landscape in southern Ontario. An emphasis is placed on the agricultural sector as one of the major key stakeholders in the conversation about achieving a sustainable landscape due to the area of land dominated by agriculture in parts of southern Ontario. Rural non-farm landowners are also a growing and significant constituency in rural southern Ontario. Forestry on private lands in southern Ontario, owned by both farmers and non-farm landowners, is both an important economic activity and potential force for ecological sustainability.

Sustainable management of rural and urban landscapes is now commonly accepted as a desirable goal in Municipal Official Plans, public policy and other community-based initiatives. It is also increasingly recognized that sustainability consists of three components: the natural environment, society and the economy; however, society and economies rely upon a functioning natural environment to remain healthy and viable. Sustainable landscapes are thus viewed as landscapes that integrate the needs of both society and economies within the context of a functioning and healthy natural environment. The evolving and changing nature of landscapes must also be integrated into any discussion.

Unsustainable land use practices, population growth, expansion of urban areas, resource extraction, pollution, lack of understanding about agricultural practices and other factors present significant challenges to the protection of natural ecosystems and agricultural landscapes. A number of environmental problems, including habitat loss and fragmentation, the spread of exotic invasive species, impacts from chemical pollutants, and climate change, continue to threaten the resiliency of the southern Ontario landscape and negatively impact biological diversity (biodiversity)[1]. The protection of fundamental ecosystem processes has been called for repeatedly by various scientists and landscape planners (e.g., Noss 2004; Saunders et al. 1991). Protection of these processes assists in the protection of biodiversity and benefits both rural and urban communities. Biodiversity contributes substantially to many vital ecosystem services such as nutrient cycling, flood control, replenishment of groundwater, pollination, soil conservation,

[1] Biodiversity is the variety of life and its processes; it includes the variety of living organisms, the genetic differences among them, the communities and ecosystems in which they occur and the ecological and evolutionary processes that keep them functioning; yet ever changing and adapting (Noss and Cooperrider 1994)

air quality and natural pest control (McPherson et al. 2009). The protection of natural ecosystems is thus vital to achieving a sustainable economy and society.

Environmental problems are problems for everyone, not only the conservation community, as all facets of society depend upon the goods and services provided by ecosystems. Healthy ecosystems carry out a diverse array of processes that provide both goods and services to humanity. Here, goods refer to items often given monetary value in the marketplace, whereas the services from ecosystems are valued, but are rarely bought or sold. Ecosystem goods include such things as food, construction materials, medicinal plants, wild genes for domestic plants and animals, tourism and recreation. Ecosystem services include such things as maintaining hydrological cycles, regulating climate, cleansing water and air, pollinating crops, generating and maintaining soils, storing and cycling essential nutrients and more. Ecosystems and the goods and services they provide are important for providing healthy communities (urban and rural), maintaining the environment, supporting the agricultural sector, providing biodiversity protection, and the maintenance of ecosystem services that benefit human well-being. The concept of ecosystem goods and services is relatively new and may not have meaning for the general populace; furthermore, the concept may mean different things to different people. The concept has, however, provided a means of communicating the importance of ecological features and functions to those not already engaged in the science behind the conservation movement. All humans consume ecosystem goods and services for their very existence. In some cases, private landowners may produce net ecosystem goods and services, in other cases landowners may be net consumers of ecosystem goods and services.

Approaches to sustainable community development used to date have, for the most part, failed to take an integrated approach (Edge and McAllister 2009). The Brundtland Commission's report, a seminal document on sustainability, defined sustainable development as "development which meets the needs of current generations without compromising the ability of future generations to meet their own needs" (WCED 1987). A sustainable community may be defined as one that leads "towards improving human health and welfare for the present generation, while being contained within the carrying capacity of life supporting ecosystems to ensure that future generations have the ability to achieve the same goal" (Kozlowski and Hill 1999, p. 120). Sustainability directly relates to the quality of life in a community. Quality of life, in this case, refers to whether the economic, social and environmental systems that make up the community are providing a healthy, productive, and meaningful life for all community residents, present and future. The concept supports strong economic and social development. At the same time, it underlines the importance of protecting the natural environment, as economic and social wellbeing cannot be maintained or improved through environmentally-destructive measures. This concept is not new (see Design with Nature, Ian McHarg 1969), but has moved beyond scientists to receive growing support from the general population.

Conservation planning is often informed by quantitative targets (Carwardine et al. 2009). A conservation target is an explicit goal that quantifies the minimum amount of a particular biodiversity feature that should be conserved (Possingham et al. 2006 *in* Carwardine et al. 2009). Targets can be set at various scales, ranging from global to local. A study completed by Carwardine et al. (2009) looked into the range of opinions held by the conservation community with respect to target-based approaches to conservation planning. In reviewing the literature, the

approach is sometimes viewed as inadequate, inflexible, and even counterproductive, while others view it to be useful in practice for providing flexible options upon which planners and stakeholders can base their negotiations and decisions (Cowling et al. 2003 *in* Carwardine et al. 2009). Despite certain unfavourable reviews of the approach, the use of targets in conservation planning is internationally accepted as best practice and continues to remain at the forefront of many conservation planning exercises (e.g. natural heritage system planning). Carwardine et al. (2009) list six common concerns or limitations of the use of targets in conservation planning: (1) setting conservation targets results in perverse outcomes; (2) conservation plans based on targets will be inadequate; (3) conservation plans based on targets will be inflexible and over-ride expert judgement; (4) conservation plans based on targets will be unachievable; (5) the approach fails in intact landscapes; and (6) the approach cannot consider complex factors such as climate change, ecological processes, threats and socio-economic criteria. The study concludes that most concerns raised are misconceived and have largely arisen from poor communication about the nature and intention of conservation targets. Overall, targets and thresholds benefit conservation planning exercises by providing clear goals, which offers the important opportunity to assess and evaluate short-term goals (Carwardine et al. 2009).

Sustainability has been used to denote natural heritage protection and ecological sustainability, as society and the economy are subsets of the environment. Approaches typically used to bolster support for sustainable landscape planning have largely focused on conservation, with less attention paid to the economic and/or social components of sustainability. There is a need to objectively look at basic ecological and biological principles and derive meaningful conservation approaches that acknowledge and incorporate economic and social considerations. Numerous targets and thresholds for land cover (i.e., forest cover, wetland cover, riparian vegetation) have been created based on scientific principles and models. These targets and thresholds guide land use planning decisions and natural heritage system design. In some cases, achieving these targets and thresholds is not possible (at least in the foreseeable future). Targets and thresholds, therefore, must be viewed as goals, and a generational approach to achieving them must be adopted. Previous approaches have led to some success in mitigating environmental problems, however a lack of collaboration has often led to disparate efforts, which can result in differing viewpoints between the different stakeholders.

Observational evidence suggests that many natural systems are being affected by regional climatic changes, particularly temperature increases (IPCC 2007, p. 31). Unmitigated climate change will exacerbate many environmental problems, adding an additional layer of concern and urgency for creating sustainable landscapes. Addressing adaptation and resilience to climate change may provide common ground for the various stakeholders in sustainable landscape planning to address these environmental problems. Currently in Ontario, various organizations, governments and companies have directed efforts toward mitigating the impacts of climate change. The Ontario Expert Panel on Climate Change Adaptation has recently recognized the need for an Ontario-based action plan that addresses adaptation and resilience to climate change. Hydrological protection mechanisms (e.g., beneficial management practices), soil erosion prevention, biodiversity conservation, and wetland maintenance and enhancement represent important components of a climate change adaptation program, as their protection will facilitate resilience to predicted environmental changes. A coordinated and long-term approach to protecting and enhancing natural spaces is arguably the most effective way to mitigate and adapt

to climate change in southern Ontario. In addressing concerns related to climate change, an inclusionary approach should be taken. Farmers who work the same land year in and year out are sensitive to small changes in condition and circumstance that may not be apparent to others not integrally linked to the land on an ongoing basis.

Many of the concepts and information presented in this paper also apply to Integrated Watershed Management (IWM). IWM is the process of managing human activities and natural resources on a watershed basis (H_2Ontario Symposium 2009). This approach allows for the protection of important water resources, while at the same time, addressing other critical environmental issues. In Ontario, IWM has been noted as an important approach to maintaining biodiversity, including water quality of the Great Lakes Basin. While much of the discussion in this paper focuses on integrated landscape management, the approaches to addressing the issues presented may also apply to the maintenance, restoration and rehabilitation of healthy watersheds.

The Stewardship Network of Ontario (SNO), an organization not attached to a government agency, represents stewardship groups across the Province and is ideally situated to initiate grassroots, community-based sustainable landscape initiatives by providing guidance, knowledge, and through the facilitation of networks. A number of discussions points (see Section 4.0) represent subject areas that our research suggests are important for SNO member organizations to be conversant with, and which can be used in workshops with community groups to explore commonalities and start participants off on a common footing. SNO advocates for voluntary, private land stewardship as an important tool for environmental conservation.

2.0 PURPOSE AND RATIONALE

The Stewardship Network of Ontario (SNO) recognizes the need for all landowners to work collaboratively in adapting and responding to climate change (SNO 2010; see Appendix 1). A healthy environment is the foundation for all other facets of society and economy. SNO recognizes the interrelationships among climate change resilience, ecosystem integrity and the quest for sustainability. Discussions that follow synthesize existing information on the topic of sustainable landscape planning with the view to improve collaboration and social-learning among stakeholder groups in the southern Ontario context. Key commonalities, as well as differences, among stakeholder groups must be identified to assist in improving collaboration, recognize the needs of others, and assist in achieving a community-based process for building a community plan that is viable for all groups and interests. Stewardship is about people, extension, incentives, education, but perhaps most importantly it is a people process based on trust. Through collaboration, social-networks and social-marketing directed by the stewardship and conservation communities, ideas are spread and eventually becoming accepted. Success stories from across southern Ontario, such as the Environmental Farm Plan (EFP) (see Appendix 4), can attest to this and provide inspiration for stewardship activities in the years to come.

This paper will act as a jumping-off point for a series of facilitated workshops organized by SNO throughout different parts of Ontario as part of their 2010 Annual Form. At this forum, regional target setting exercises that build upon local realities, knowledge and aspirations will be further explored. The purpose of this paper is to identify and elaborate on a series of ‘discussion points’

to generate dialogue both within SNO, and between SNO partners and external groups. In particular, these discussion points can be used at the forthcoming workshops to stimulate dialogue and promote common understanding of what sustainable landscape planning represents, and the opportunities and challenges it presents.

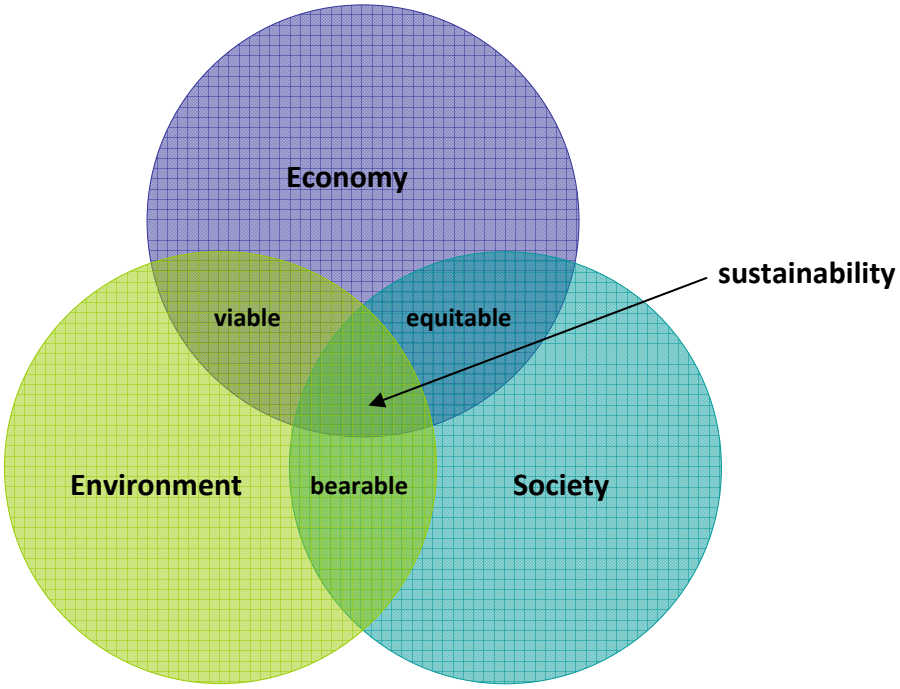
3.0 WHAT IS A SUSTAINABLE LANDSCAPE?

Components of a sustainable landscape include a healthy natural environment, society and economy. Ecosystem health provides the foundation for sustainability whereby certain ecological parameters cannot be exceeded. These ecological support services are of paramount importance, as economic or social sustainability cannot be attained without a healthy, functioning ecosystem. "Sustainability is a concept, a goal, and a strategy. The concept speaks to the reconciliation of social justice, ecological integrity and the well being of all living systems on the planet. The goal of sustainability is to create an ecologically and socially just world within the means of nature without compromising future generations. Sustainability also refers to the process or strategy of moving towards a sustainable future" (Moore 2005). Sustainable landscapes thus involve the simultaneous pursuit of economic viability, environmental persistence and social equity (WCED 1987). Landscape planning must aim for sustainability and not a single, financial bottom line but the 'triple bottom line'. The triple bottom line, or the 'three pillars' of sustainability (i.e., environment, society, and economy), have been expressed as an illustration using three overlapping circles to indicate that the three pillars are not mutually exclusive and can be mutually reinforcing (see Figure 1; Adams 2006). This diagram has undergone various interpretations, as has the definition of sustainability, what its goals should be, and how these goals are to be achieved. To some, the concept of sustainable development is an oxymoron, as development connotes environmental degradation (Daly and Cobb 1989). The traditionally used diagram of three overlapping circles has been modified to reflect the fact that the economy and society are both subsets of the natural environment, imposing limits to their growth and long term well-being (see Figure 2; Ott 2003).

Social, environmental, economic and political systems must be recognized as inter-dependent in order to achieve sustainability. When faced with decisions related to sustainable landscape planning, costs and benefits should be weighed fully, including long-term costs and benefits to future generations in the context that resources are finite and that there are limits to growth set by the natural environment (see Figure 2). Decision-making, in the context of sustainable landscape planning, should recognize that the ability to predict the needs of the future is limited, and attempts to define sustainability on the ground should remain as open and flexible as possible.

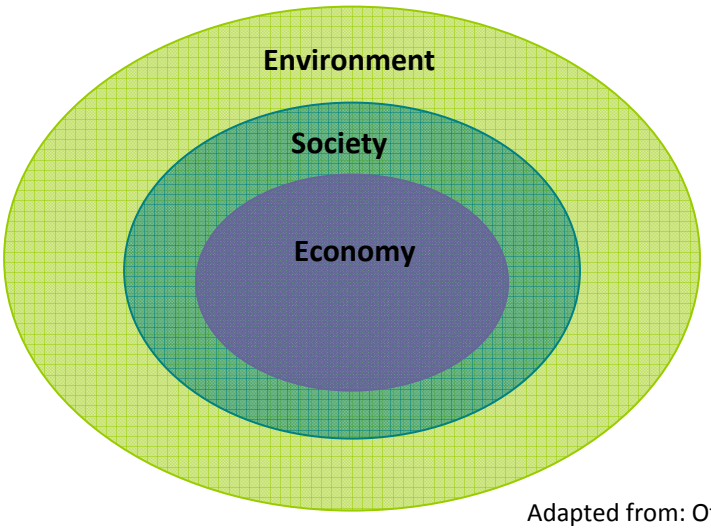
Sustainability is applied not only to human sustainability, but to many situations and contexts over many scales - from small and local to global. It can also refer to a particular component or aspect of sustainability, such as 'environmental sustainability' or 'ecological sustainability' that focuses largely on achieving natural cover targets and functional natural heritage systems, without giving due regard to other pillars of sustainability. Sustainability can refer to a future intention, representing a prediction or goal for the future, rather than a current situation. For these reasons, sustainability can be perceived as nothing more than jargon (see section 4.16 for

discussion on the use of confusing terminology) or as an important but unfocused concept like liberty or justice.



Adapted from: Adams 2006

Figure 1. The three pillars of sustainability and areas of mutual reinforcement.



Adapted from: Ott 2003

Figure 2. The three pillars of sustainability, whereby the economy and society are subsets of the natural environment.

To achieve a sustainable landscape, basic thresholds for ecological functions need to be met and common ground on land-use must be found. Sustainability applies to various scales and thus requires specification in and for particular places and applications (Gibson 2005, p. 61). The following criteria for sustainability must be considered and elaborated upon in sustainable landscape planning: (1) socio-ecological system integrity; (2) livelihood sufficiency and opportunity; (3) intra-generational equity; (4) inter-generational equity; (5) resource maintenance and efficiency; (6) socio-ecological civility and democratic governance; (7) precaution and adaption; and (8) intermediate and long-term integration (Gibson 2005, p. 95). These requirements can assist in leading discussions on the topic of sustainable landscape planning. Sustainable landscape planning offers an opportunity to resolve many of the issues discussed in this paper, and achieve at least partial fulfillment of objectives from multiple stakeholders. A key requirement of achieving collaboration is the need to engage all stakeholders at the outset of a project and identify key commonalities and differences as a starting point. A sustainable landscape must integrate and reconcile the needs of each stakeholder group to achieve a balance that can persist over the long term. The focus of this discussion paper is to identify topics that, through dialogue, will assist in reconciling differences and fostering collaboration between the agricultural and conservation sectors.

4.0 DISCUSSION TOPICS

4.1 Role of targets and thresholds in the sustainable landscape planning process

Targets and thresholds provide useful direction for planning, assessment and prioritization of natural heritage protection and sustainable landscape initiatives. Depending on the focus of the target or threshold, various factors may influence the outcome of the equation. There are, however, limitations associated with the use of targets and thresholds in sustainable land use planning.

Summary

Targets and thresholds are a commonly used and accepted tool for providing direction and assisting with evaluation of the success of environmental initiatives at various scales. Environmental targets and thresholds, such as the forest and wetland cover targets recommended in “How much habitat is enough?” (Environment Canada 2004), can provide science-based guidelines that can inform natural heritage system design (see Appendix 3 for research initiatives undertaken by MNR on this topic). The Government of Ontario launched a Natural Spaces initiative that is developing voluntary stewardship programs to encourage private landowners across southern Ontario to protect and restore natural areas (Puric-Mladenovic and Strobl 2007). To provide a strategic basis for implementing such programs, a rigorous and defensible science-based methodology has been developed to integrate the appropriate targets and thresholds. This approach has been used to delineate conservation areas on the Oak Ridges Moraine (Puric-Mladenovic and Strobl 2006).

Targets and thresholds assist in determining whether or not there is adequate wetland, riparian and forest habitat cover to sustain minimum viable wildlife populations and help maintain selected ecosystem functions and attributes. Importantly, they provide decision-makers with

defendable goals for restoring natural vegetation cover to meet biodiversity objectives and long term ecosystem health. The intent of these types of guidelines is not to dictate local decisions, but rather to provide planners and natural heritage ecologists with the best available information to make decisions on how much natural area is required to rehabilitate the local landscape. Targets and thresholds can assist in identifying unsustainable components of the landscape, helping to clearly articulate reasons why certain areas are below accepted thresholds of sustainability. This can then be translated into implications for local communities, which is essential to assisting the public in understanding that the current southern Ontario landscape is unsustainable.

The most frequently quoted targets and thresholds for natural cover in southern Ontario are 30% forest cover (per watershed), 10% wetland cover (per watershed; 6% per subwatershed), and 75% naturally vegetated stream lengths (Environment Canada 2004; TRCA 2007; McPherson et al. 2009; Kennedy and Wilson 2009). These percentages are applied to local landscapes and used to create models to identify natural heritage systems and optimal areas for restoration. These targets and thresholds are based on the best science available, yet uncertainty remains around how much of an ecosystem must be protected to ensure its viability. A recent report has suggested that 50% of all natural areas must be protected (e.g., Nature Needs Half™ 2009) to sustain biodiversity and vital ecosystem functions in the very long term. In some areas of Ontario, these targets can be easily met, in others they represent lofty goals. In many areas a multi-generational approach is required to achieve them.

Ontario contains Canada's most productive farmlands. 25% of the value of Canadian agricultural production comes from Ontario, but Ontario's 5.39 million hectares of farmland represents only 8% of Canada's farmland (Statistics Canada 2006). Targets and thresholds for agricultural economic viability have also been created. However, they can vary significantly based on soil quality, the type of crop being grown and the size of the farm. The Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) has some set guidelines on the size of agricultural areas. These guidelines contemplate minimum area requirements for a sustainable agricultural community. However, depending on the type of production this figure may be too high or too low. Despite the setting of thresholds, agriculture continues successfully in areas where the thresholds are not met. There is work required to adjust these guidelines to different circumstances. Recognition of the need to protect the ecological processes that keep agricultural land productive, such as development that reduces groundwater infiltration within watersheds, is important. The loss of groundwater infiltration capabilities will ultimately cause a decline in agricultural productivity. Agricultural lands need to be protected not only by implementing separation distances from adjoining development, but also through the protection of the ecological underpinnings that support agricultural productivity.

OMAFRA continues to work on this and has developed an objective tool to help municipalities identify prime agricultural areas. This tool is called the Land Evaluation and Area Review (LEAR) system. The system has two components: Land Evaluation (LE), which is used to assess land capability for agriculture; and (2) Area Review (AR), which is used to assess other important factors that affect agricultural activities, such as parcel size and fragmentation. Factors considered include soil rating, climate, parcel size, fragmentation, proximity to other parcels, presence of tile drainage and farm receipts/cropped area, ultimately to identify prime

agricultural areas. This tool has been used to determine prime agricultural lands for the purpose of inclusion in municipal official plans.

The Ministry continues to work on an evaluation process to assist in the identification of specialty crop areas, which by their nature, are distinct and worthy of higher levels of protection. The purpose of classifying agricultural lands as specialty crop areas is to protect important agricultural lands from development. They can also be smaller or larger, depending on the circumstances and are difficult to capture using traditional threshold or target criteria. There is a distinction between ecological and agricultural targets and thresholds, and targets and thresholds for landscape sustainability. Targets and thresholds for community viability provide a different context, and climate-related targets and thresholds further complicate decisions related to sustainable land-use planning. Depending on the topic of focus, targets and thresholds can vary substantially and have the potential to provide overlapping and conflicting guidelines. For example, what constitutes natural cover? Members of the agricultural community maintain that certain crop types contribute to carbon sequestration and greenhouse gas reduction. An integrative, multidisciplinary approach is likely required to tease out targets and thresholds that are applicable to achieving a sustainable landscape and capable of integrating ecological, economic and society needs.

However, since sustainability is a process rather than a static state, the development of targets and thresholds *a priori* cannot be completed without contemplating the particular landscape, its evolution, and the land-uses that comprise it. A prescriptive approach, in this case, may not be the most appropriate as the applicability of targets and thresholds will vary according to place, historical use, time since disturbance, and more. Thus, for achieving sustainable landscapes, targets and thresholds for various objectives (biodiversity, viable agriculture, climate change, etc.) all need to be brought into the discussion.

SNO and other stewardship-based organizations assist in communicating the state of the current landscape, through various programs and educational outreach using tools that often draw on statistics related to landscape targets and thresholds. Under some circumstances, local/regional target setting may prove to be an effective form of outreach that ultimately motivates actions (e.g., to improve regional forest cover). In terms of stewardship outreach, success may be measured by the number of Ontarians who understand that the current landscape is unsustainable, and targets and thresholds play a key role in communicating this message. Furthermore, achieving support for agreed upon targets and thresholds, through individual stewardship actions or by other means, will invariably foster support for planning initiatives that protect natural heritage and a sustainable landscape.

<u>Suggested Directions</u>

- targets and thresholds that strive to integrate the connections among the environment, economy and society could be developed at a generic level to support the concept of sustainable landscapes;
- acknowledge the local context and shift focus toward developing sustainable landscapes, considering all targets and thresholds in combination;
- consider implementing a multi-generational approach to achieving targets and thresholds;

- targets and thresholds of this ilk may achieve greater buy-in due to their integrated nature and may assist in achieving greater progress and at a faster rate;
- recognize that in terms of ecological footprints, urban areas far-exceed the long term carrying capacity of the land;
- acknowledge the considerable progress agriculture has made at introducing environmentally sustainable land use practices (no till farming, integrated pest management, crop rotation, etc.)
- consider the development of sustainability-based indicators, which may provide a useful approach to determining the success of landscape planning initiatives (e.g., Watershed Report Cards: http://www.conservation-ontario.on.ca/watershed_monitoring/index.html); these indicators could integrate the various targets and thresholds that impact sustainability; and
- identify areas where ecological conditions and associated goods and services are at risk of collapsing, no longer supporting economic and societal needs in a sustainable way, as priority areas for achieving ecological targets.

4.2 Aim to increase natural cover in agricultural areas

Natural cover could be increased in agricultural areas for the benefit of farmers, the natural environment, and as an adaptation strategy in response to climate change predictions. There is a need to acknowledge that the only way to achieve this is by working with farmers (who have already taken important steps toward addressing this problem in many ways) by making them a part of the solution as opposed to part of the problem. There is also a need to acknowledge the importance of maintaining our productive agricultural lands to provide fresh, local food for Ontarians.

Summary

Maintenance, and in places an increase in natural cover (i.e., any form of native or natural vegetation growing largely unmanaged at a particular site) can mitigate certain impacts from climate change such as drought, soil erosion, water temperatures, and greater temperature fluctuations, and thus benefits future farming in Ontario (NRCAN 2007) by improving the resilience of Ontario's agricultural sector in light of future climatic changes (Wall et al. 2007). Increases in natural cover will simultaneously benefit biodiversity, natural heritage protection, air quality, ground and surface water quantity and quality, and more.

Ontario needs both farmland and natural areas. Ontario's most productive farmland (Class 1-3) is not distributed evenly across southern Ontario. It is concentrated in certain regions such as southwestern and southeastern Ontario. In areas with a high percentage of Class 1-3 farmland, it is unrealistic and undesirable to switch a large percentage of farmland into natural areas. Ontario and Canada needs those lands for food production and food security. In such areas, a more strategic, targeted approach to natural cover is needed. On the other hand, in many parts of Ontario over the last several decades, a large amount of former farmland has been abandoned and returned to forest or successional habitat cover.

The likelihood of increasing forest cover within predominantly agricultural landscapes will largely depend upon individual attitudes, willingness to participate in non-traditional agriculture

and finding benefits that can be derived from alternates to standard farm practices (e.g., income generation from forest products, use of grasslands for grazing and/or bio-fuel production, etc). There is also the need to balance the net benefit of moving from agricultural production to forest cover. For example, in the case of reforestation in the Rouge Park in the City of Toronto, does society benefit more from increased forest cover in this area or the fact that this is some of the most productive land in the country for growing fruits and vegetables? In general, farmers realize an increase in soil and water conservation, land rehabilitation and land value/equity from forestry-related stewardship activities (Matthews et al. 1993). Ecosystem goods and services research currently investigating on-farm benefits of trees, may shed some light on the discrepancy between surviving in a competitive agricultural market place, while shouldering the burden of maintaining the integrity of their lands. Ecosystem goods and services research continually demonstrates the link between environmental and economic sustainability. Stewardship activities thus have the potential to alleviate both economic and ecological stress on southern Ontario farms. There is a need to compromise, and stewardship practitioners must continue to work from an agricultural perspective as well as an ecological one.

Suggested Directions

- effectively communicate the economic benefits of increasing natural cover in agricultural areas to farmers (outreach is occurring in many ways, in some cases effectively, but there are other factors at play: desire for new and additional incentives, technical support, better economy, political support, etc.);
- look for opportunities for new and existing demonstration projects and communicate the message about these examples more effectively to illustrate stewardship options available in certain parts of southern Ontario (oftentimes, local examples can have a chain-reaction affect, encouraging other landowners to implement stewardship activities on their own lands; information and communication must also reach higher levels of government to foster political support for stewardship initiatives to clearly communicate the message); and
- many examples of successful stewardship projects already exist; messaging and communication tools could indicate how these efforts address climate change, biodiversity, Great Lakes water quality, etc.

4.3 Sustainable forestry as an alternative to agriculture

In many parts of Ontario, sustainable forestry provides an ecologically and economically viable source of income to private landowners, both farmers and non-farm landowners. Sustainable forestry compares favourably with agriculture in terms of economic return. Large portions of eastern and central Ontario produce significant forest products. Sustainable forestry on private lands can be entirely compatible with natural heritage conservation (Hickey et al. 2007).

Summary

In parts of southern Ontario, agricultural communities are struggling to sustain economically viable farm operations. Huron Stewardship, in partnership with organizations and landowners, investigated economic returns from woodlands and compared those to agricultural returns from comparable lands over the same period (Huron Stewardship website, April 29, 2010). Results from case studies found that returns from managed forests (i.e., sustainably harvested hardwoods

and/or maple syrup production) were able to generate substantially more revenue per acre through woodlot management than a typical crop rotation of corn, soybeans and wheat in western Ontario. Case studies from other parts of Ontario (e.g., Victoria County in eastern Ontario, and Bruce County) indicate similar results. The Huron Stewardship study demonstrates the potential for enhancing long-term financial returns through stewardship and sustainable forestry operations. Woodlots provide a significant share of the raw material used by the forest industry in many parts of Canada, and are an important source of economic stability for many rural communities (NRCAN Canadian Model Forest Network Fact Sheet). These woodlots are also a source of important environmental benefits (e.g., wildlife habitat and biodiversity, clean water, etc.), not only for their owners but also for the larger community.

Ontario has a total of 7.6 million hectares of privately owned forest lands, about half of which are in southern Ontario. The Ontario Woodlot Association provides a variety of important resources for landowners and stewardship practitioners (refer to their website at: http://ontariowoodlot.com/links_online.html). In particular, "Building a Case for Sustainable Management of Private Woodlands" highlights case studies that provide an excellent overview that the economic returns from a woodlot, largely through timber sales, compare very favourably to those from agricultural crops on comparable land over the same time period. Four case studies are provided (i.e., Barrie Woodlot, Scott Woodlot, Foote Woodlot and Horning Woodlot) to provide examples of different scenarios from various parts of Ontario. Results from this study are consistent with the findings from the studies presented by Huron Stewardship. The Ontario Woodlot Association also provides excellent resources for landowners, such as "A Landowner's Guide to Careful Logging" (Available at http://ontariowoodlot.com/pages_pdf_new/Careful-Logging-web.pdf). The Eastern Ontario Model Forest also has many excellent publications relevant to this topic (Available at http://www.eomf.on.ca/home/home_e.aspx). For example, the sustainable forest certification project brings private woodlots owners together to learn about and apply the concepts of sustainable forest management under the principles and criteria of Forest Stewardship Council (FSC) certification.

Suggested Directions

- consider strategies for communicating the potential for sustainable forestry in parts of Ontario;
- recognize the contribution of private woodlot owners to the conservation of natural heritage and to rural economic development;
- determine locations where sustainable forestry would be feasible and desirable;
- What role can stewardship play in sustainable forestry? Are there opportunities for education and/or increasing forest cover?; and
- How, or to what extent, can promoting sustainable forestry as an alternative to agriculture contribute to increasing natural cover across southern Ontario?

4.4 Role of the land acquisition process in achieving local targets

Land acquisition initiatives may play an important role in achieving local targets and fostering local community support for ecological initiatives.

Summary
Various conservation organizations (e.g. Nature Conservancy of Canada, Ontario Nature, Credit Valley Conservation) utilize land acquisition as a tool in conservation efforts. The principle behind land acquisition for the purpose of conservation is, generally, not to acquire land for its own protection but rather to work with local communities and governments to encourage the protection of ecologically-sensitive land. Land Trusts, also called land conservancies, form one of the fastest-growing and most successful conservation movements in North America (Land Trust Alliance 2006). Land trusts conserve many different types of land, including farmland and natural spaces. Some parcels protected by land trusts have no, or extremely limited public access, and many protected areas remain under private ownership. Protection efforts involving land trusts utilize different tools, depending on the scenario which offers a great deal of flexibility in achieving conservation targets. Each conservation easement is carefully grafted to meet the needs of the landowner while not jeopardizing the conservation values of the land. This flexibility may provide options for innovative solutions to achieving sustainable landscape targets and thresholds.

Suggested Directions
- communicate the scope of land trusts and that land trusts are not only for natural spaces (e.g. see Ontario Farmland Trust www.ontariofarmlandtrust.ca/)
- consider opportunities for partnering other conservation organizations with land trusts; and
- look for ways of adopting the flexibility offered by land trusts to other conservation-based programs.

4.5 Approaches where targets and thresholds can clearly not be met

In some parts of southern Ontario, forest cover targets and thresholds can clearly not be met in the foreseeable future based on the current landscape scenario. This is no reason to avoid articulating ecologically-based targets; however, the approach to achieving these targets over the long term may vary from parts of the landscape with higher percentages of natural cover.

Summary
Current land-use patterns in many counties in southern Ontario do not meet recommended ecological targets and thresholds, particularly in the southwest. Often, these counties support a high level of agricultural production. Maintaining Ontario's most productive farmland in food production is important for all Ontarians. Although in these cases, economic considerations of agriculture, the need to increase forest cover and the need to provide protection against climate change-related impacts still should be balanced, the balance should consider the benefits of having a high proportion of the landscape being used for food production, as well as the reality of the current situation. Appropriate scales at which to consider forest cover targets might be reviewed and applied on a case-by-case basis. Instead of focusing on a 30% forest cover target within these areas, riparian cover targets to protect clean water and provide ecological linkages may be a more appropriate first step. Achieving 75% natural vegetation cover along the watercourses in southwestern Ontario would significantly increase regional percentages of natural cover while also improving the area's ability to adapt to climate change and other environmental challenges. The restoration of non-wooded ecosystems, such as the work Rural

Lambton Stewardship is undertaking (see Appendix 5 for an overview), offer diversity to the suite of stewardship initiatives offered.

Suggested Directions

- prioritize where effort is placed by balancing between areas with low forest cover and where local opportunities exist (i.e., balance the priority of addressing areas that are far from ecological targets with opportunistic approaches in other areas);
- in southwestern Ontario, consider focusing on improving natural vegetation cover along riparian areas and local pockets with lower agricultural capacity as a first step to achieving ecological targets (there are many examples of this happening through existing farm incentive and rural water quality programs in the province, e.g., many CAs partner with the Ontario Soil and Crop Improvement Association and municipalities to deliver important stewardship programs);
- consider other forms of natural cover, such as meadow and prairie, which may be more amenable to agricultural areas; and
- identify opportunities to promote connections between counties, townships, watersheds to draw on synergies from neighbouring jurisdictions.

4.6 Climate change as common ground

Ontario's environment, society and economy are all affected by climate, thus it must be an issue of central concern in any discussion about sustainable landscapes. The existing ecosystems, economies and social structures have developed within, and are based on the prevailing climatic conditions. Therefore, any shifts in the climate is going to have repercussions that affect all facets of life in Ontario, and elsewhere. Farmers are extremely sensitive to climatic changes, as they recognize differences in climate on a field by field basis. As such, they are amongst the best harbingers of change.

Summary

In general, the composition of terrestrial ecosystems is determined by temperature, water availability and soils. Aquatic ecosystems are affected by water temperature, the distribution of freshwater and the hydrologic cycle. Past temperature changes of one degree have caused substantial changes in the home ranges of species (Environment Canada 1997). The historic fragmentation of natural habitat will have an impact on the ability of many species of plants and animals to disperse and migrate in response to changing climates; thus climate change has the potential to cause substantial local extinction of species and reductions in biodiversity on a large scale.[2] Climatic conditions and soils are the primary environmental determinants of which agricultural products will be viable in a particular area. Year-to-year changes in productivity are governed largely by the inter-annual variability of climate (Environment Canada 1997). Temperature increases and increased intensity of storms also have the potential to cause the loss of life, damage to infrastructure; and air quality is predicted to decline with increasing

[2] The large difference in the biological diversity of western Europe and North America has been explained by the inability of European biota to migrate south during the last ice age owing to the effective barrier created by the Alps, as opposed to the absence of such a barrier in North America. Thus, climate change would appear to have the capacity to impact biodiversity for thousands of years if the distribution of flora and fauna cannot adjust.

temperatures. These findings clearly indicate that many aspects of Ontario's environment, economy and society are sensitive to and will be impacted by climate change.

Agriculture will invariably need to adapt to climate change. Adapting most effectively to a changing climate requires a knowledge of how climate will change and how the changes will affect the environment, society and economy. Since the goals and targets of all stakeholders will be impacted by climate change, climate change and the need to adapt to changing climatic variables should be promoted as a discussion point and an area of common ground among stakeholders for sustainable landscape planning.

Suggested Directions

- identify ecosystem goods and services that are likely to be impacted by climate change and consider using this as a starting point to encourage stewardship activities;
- work with farm organizations to identify and manage impacts of climate change
- recognize common ground in addressing climate vulnerability and the need to adapt;
- determine the extent to which increasing natural cover and providing natural linkages can mitigate the impact of climate change on biodiversity, as well as mitigate degradation of soils and hydrological systems that will affect agricultural viability; and
- reduce known vulnerability to climate change by restoring degraded habitats, preserving existing ecosystems and adjusting crop types.

4.7 Consider the repercussions of rural sprawl

In southern Ontario, "rural sprawl" has increasingly presented complications for farmers. Scattered rural residences also fragment natural heritage areas and create edge habitat within larger contiguous forests and other habitats.

Summary

Rural sprawl takes a number of forms: (1) low-density residential development that is scattered outside of villages, suburbs, and smaller cities; (2) commercial strip development along arterial highways leading into and out of villages, suburbs and smaller cities; and (3) location of land extensive or obnoxious uses in rural areas because of land availability (camps, churches recreational facilities including golf courses and sports fields, wrecking yards, small air strips, contractors yards, storage facilities, etc.). Rural sprawl creates a host of planning challenges as well as challenges for the agricultural community. Servicing can be an issue with widespread low-density housing, for example, by creating water quality issues from improperly functioning septic systems, and for those residents not able to telecommute, long-range commuters place greater demands on existing roads, present conflicts with use of roads by the farming community[3], and are energy inefficient. Conflicts between agricultural practices and adjacent uses create problems for both parties.

[3] Two often-cited examples include, slow-moving farm machinery conflicting with the desire of commuters to travel at (or above) the speed limit to get to work in urban centres with resultant safety issues and frustration by both user groups, and weekend groups of cyclists are often noted as having little respect or understanding for large farm machinery using the roads.

Rural sprawl can also drive up land prices in rural fringe areas beyond what famers can pay for, making it difficult for farmers to maintain their farms, or for new generations of farmers to purchase viable farms, especially near expanding urban centres. This further fragments the rural countryside in physical terms and in regard to planning needs. Furthermore, newcomers to the countryside have little understanding of the business of farming and conflicts between farmers and non-farm neighbours are commonplace. For example, minimum separation distances required between some agricultural facilities and rural residences constrain farm operations and make it increasingly difficult for farmers to operate efficiently and economically (Caldwell and Toombs 2000), further restricting opportunities for agricultural diversification and/or expansion. Such conflicts also stand in the way of developing common visions for rural landscapes and promoting local sustainability.

Rural by Choice, a report outlining research by Dr. Lee-Anne Milburn (2006), characterizes rural non-farm landowners of southern Ontario. Non-farm development can take several forms, and the impacts of rural non-farm development are felt not only by the agricultural sector, but also by recreation, forestry and the natural environment. According to Milburn (2006), mitigating these impacts within the rural landscape requires a multi-dimensional approach to planning and land resource conservation, and this approach requires an understanding of the nature and character of rural non-farm landowners. Achieving an understanding of the rural non-farm audience has and will continue to assist stewardship practitioners deliver programs both efficiently and effectively. Through this, important ecological gains can also be achieved.

So-called exurban development (i.e. ~6-25 homes/km^2; includes urban fringe development and rural residential development) is recognized in the US as the fastest (Hansen et al. 2006, Merenlender et al. 2009) and having large impacts on natural areas. Merenlender et al. (2009) monitored birds for 5 years across three housing density levels in northern California oak woodlands and found that individual species and groups of species exhibited variable responses to exurban development. This study indicates that large undeveloped parcels of land are essential for the conservation of certain bird species. Hansen et al. (2005) completed a study to synthesize current knowledge of the effects of exurban development through two case studies. Their study found that in the context of exurban development, many native species have reduced survival and reproduction near homes, native species richness often drops with increased exurban densities, exotic species and some human-adapted native species, and species from early successional stages often increase with exurban development (Hansen et al. 2005). The main reasons for impacts resulting from exurban development include alteration of habitat, ecological processes, biotic interactions, and increased human disturbance. Understanding the impacts of all forms of development on the natural environment will assist environmental planners and stewardship practitioners in understanding the need to appropriately manage and mitigate negative impacts on biodiversity.

<u>Suggested Directions</u>

- recognize the diversity of difficulties farmers face when developing and implementing stewardship programs;
- understand the impacts of scattered rural development on natural habitats;
- seek to understand and influence ways to deter rural sprawl;

- implement strong enforceable planning controls to protect natural features, preserve farmland, and protect the right to farm; and
- provide appropriate opportunities to increase natural cover through stewardship initiatives.

4.8 Dispel myths about a dying rural economy

Urban myths about supposedly 'dying' rural economies and communities do not reflect the reality of activity, ingenuity, or diversity of rural communities or the capacity of rural landowners for stewardship and conservation initiatives. Rural communities and economies in Ontario are diverse, dynamic and influenced by many factors. But rural and urban economies are different in many ways.

Summary

So-called dying rural economies are often discussed in the media, with statistics stating that over 80% of Canada's population now lives in "urban areas", cities or towns. But this statistic is misleading, as the definition of an urban area is centres with a population of more than 1,000 and a density of "400 persons per square kilometre", and thus includes tiny communities.

Agricultural operations are growing larger and mechanization means fewer operators can run larger farms. Family sizes are smaller today. There may be as much land under production as in the past, producing more food than in the past, but it is being produced by fewer people. Many rural economies are becoming more vibrant through the marketing of rural amenities, such as shoreline, countryside vistas, clean air, natural areas, and more. These amenities are drawing many people back to rural areas to retire, raise families or simply to live (telecommuting is making rural residences an ever-increasing greater possibility). Additionally, the growing awareness of the inefficiencies and energy-consumption of typical food distribution systems is resulting in an increasing demand for locally grown produce. Rural economies are changing, and focusing on a dying rural economy does not assist in community empowerment attraction of younger operators to farming, and engagement on stewardship and conservation initiatives. Many rural communities are developing attractive amenities and promoting a small town environment where people are drawn to live, work and participate in community life.

Suggested Directions

- recognize the opportunities that exist for promoting local stewardship and sustainable landscapes as part of the growing diversity within rural communities that exist across southern Ontario;
- facilitate the engagement of rural communities in active stewardship activities and initiatives and strive for a place-based delivery of programs; and
- communicate and share information to assist those who are interested in rural stewardship initiatives.

4.9 Rural landowner concerns represent challenges

Rural landowners' concerns about what they see as too many new regulations and top-down controls present challenges to stewardship activities and sustainable landscape planning initiatives. Acknowledging and understanding these concerns is an important step toward building a better understanding of how to achieve sustainable landscapes.

Summary

Rural landowners' concerns have arisen in many parts of Ontario, particularly in eastern Ontario, in response to the imposition of top-down controls, new regulations, and regulatory frameworks. The response to Walkerton, the Nutrient Management Act, the Clean Water Act, municipal Official Plans, the Greenbelt Act, Endangered Species Act and some Conservation Authority regulations, has in many instances contributed to an overall frustration for many rural residents. In response to this frustration, landowner organizations have mobilized and become very active and vocal. Well-meaning attempts to initiate sound conservation initiatives may be viewed by rural landowners as yet one more attempt to erode their lifestyle and ability to generate a living from their land.

Suggested Directions

- seek to understand factors that have played into rural landowners' concerns in different areas;
- avoid a top-down approach by involving all rural stakeholders in local grass-roots initiatives that address all aspects of sustainable land management from the outset;
- be prepared to step back from local processes once they are initiated, or limit involvement to facilitation of process and provision of resources, to allow for local ownership of programs;
- recognize that farmers feed cities and contribute significantly to the rural economy and way of life;
- look for examples where landowners' concerns have been addressed or overcome and trusting relationships have been built, and learn from these examples (e.g., South Nation Conservation Authority successful partnership with the local Landowners Association to address the Clean Water Act; see Appendix 5);
- coordinate regulatory controls with one point of contact to simplify processes; and
- consider how a grassroots approach to sustainable landscape planning could assist in addressing rural landowners' concerns by creating a vision of what sustainability looks like and focusing the approach on doing what is required to maintain local rural quality of life.

4.10 Need for community-based sustainable landscape planning in southern Ontario

There is a need for community-based, holistic sustainable landscape planning in southern Ontario and landscape planning is just as much about people as it is about land.

Summary

A local process for developing community-based plans is arguably the best approach to addressing landscape planning issues on the ground. Through a community-based process, commonalities and differences among stakeholders can be identified, opportunities for social-learning are presented, there is greater buy-in to the plan, and an end result that is more viable for

all groups and interests can more readily be achieved. Understanding the three key components of sustainability and their connections is essential to achieving balance among the social, economic and environmental pieces of the landscape. Therefore, in order to achieve a more sustainable landscape, an even playing field must be provided for all key stakeholders within a landscape or community to: (a) better understand the interests and perceptions of others; (b) seek understanding of the connections among economy, environment and society, and (c) achieve a sustainable landscape through collaboration.

An open and participatory approach that allows for equal representation is essential to achieving a sustainable landscape. The approach as a whole should be developed in a collaborative way, involving the entire suite of stakeholder groups who were identified in an inclusive manner. Collaboration will encourage the use of local knowledge in sustainable landscape planning and will also build relational-knowledge which is vital to long-term success. Such an approach also encourages local "ownership" of initiatives, which are more likely to succeed than programs that are imposed from outside the community. Equally important factors to identifying opportunities for collaboration include the identification of barriers to effective collaboration (which can include ideological differences), participant burnout, lack of knowledge, indifference or lack of authority, and lack of resources, among others. Creating a mechanism that addresses collaboration on achieving a sustainable southern Ontario landscape is arguably the next step to address the problem of sustainable landscape planning in a holistic way.

Numerous stakeholders are currently involved in achieving sustainable landscapes in southern Ontario and in doing so contribute to the health and quality of life in rural areas. Agriculture is a major component of the rural landscape; other sectors include rural non-farm landowners, conservation-based organizations, as well as lands held in public ownership (parks, conservation areas, etc.). Other stakeholders include the aggregate industry, forestry, recreation industry, oil and gas, rural development, energy producers, etc. These components of the landscape are not considered to be essential, and in some cases are incapable of operating in a sustainable manner at any realistic time scale. This, however, does not mean that the activities of these sectors cannot be done in a sensitive, sustainability-minded manner.

Most of the population of Ontario is settled in urban or rural settlements of southern Ontario but there is also an increase in non-farm land ownership in parts of the province. Agriculture and non-farm rural and urban land uses are becoming increasingly intertwined, making the definition and articulation of discrete stakeholder groups extremely complex, both in geographic terms and with respect to identifying a simple view of a rural perspective. This is further complicated by the fact that the non-farm rural community is not organized into any form of group, which makes stewardship outreach a difficult and complex task. Representatives from all components of the landscape must be engaged in the discussion of sustainability and when determining areas to increase natural area cover to achieve landscape targets and thresholds. Through utilizing a multi-stakeholder approach, greater opportunity to integrate all interests into a shared vision will be achieved. Ideally, a shared or complementary land ethic can be developed and fostered amongst citizens participating in the multi-stakeholder process.

Suggested Directions
- as a forum, identify common goals among stakeholders;
- as a forum, identify differences among stakeholders;
- look to examples from various watersheds around the province through watershed planning, watershed stewardship planning and strategies for guidance;
- provide an opportunity to openly discuss and move beyond differences rather than entrench them;
- consider ways to engage non-farm rural landowners in stewardship activities;
- consider the advisability of mandating sustainable planning exercise by prescribing the process rather than the outcome to strengthen the need to carry out sustainability plans; and
- include a non-partisan facilitator to guide discussions.

4.11 The need to balance differing objectives

Economic and social targets must be balanced with natural environment targets to achieve sustainability. There is a need to clarify if the goal is to achieve ecological sustainability or to achieve a sustainable landscape.

Summary
The economy and society are subsets of the environment. Therefore, to achieve a sustainable landscape, economic and societal objectives must be placed within the context of the local environment. Ecological targets and thresholds specify forest cover, wetland cover and riparian cover guidelines at various spatial scales. To achieve functional economies and society, ecological targets may not be met in some cases (e.g. see Watershed Report Card example on the Conservation Ontario Website). There is a need to balance differing objectives in the case of sustainable landscape planning, while also recognizing the finite limits of the natural environment.

Suggested Directions
- discuss how to address economic and societal needs within the context of sustainable landscape planning;
- identify scale and implications of working at such a scale;
- consider including prime agricultural lands as part of natural heritage systems and recognize the contribution they make to sustainable rural landscapes;
- recognize that ecological targets must be balanced with economic and societal needs to achieve sustainability-based targets, keeping in mind that economy and society are subsets of the environment; and
- determine framework for identifying locally appropriate scenarios that integrate all facets of sustainability.

4.12 Build stewardship programs with agriculture in mind

Stewardship programs in rural communities in many parts of Ontario already consider and should be built around sustainable agriculture, it being one of the main components of the rural landscape in southern Ontario. This should continue and increase in activity.

Summary

An increase in the percentage of natural area cover in agricultural areas can benefit both the conservation and agricultural sectors. For example, reforestation focused on fragile lands, such as blow sands and eroded knolls, can assist in reducing soil erosion while increasing the percentage of forest cover within a landscape. Other beneficial solutions to erosion, such as meadow plantings and the cultivation of prairie grasses, also add biodiversity value and provide environmental services. Plantings, including both trees and grasses, can be part of agricultural production. Other efforts that seek to restore soil quality and protect surface and groundwater also provide benefits to nature and the agricultural sector. Agriculture and nature are not mutually exclusive, and many (non-pest) species utilize agricultural lands as habitat and provide ecological services such as pollination and pest control. In fact, for many people 'countryside' represents an integrated matrix of agricultural and ecological functions which are increasingly viewed as 'multifunctional landscapes'. For example, in addition to agriculture and nature, other industry such as aggregate, renewable energy installations (solar and wind farms) are also part of the rural mix. Piecemeal controls directed at protecting the environment can increase the burden on the agricultural sector, decreasing their ability and desire to participate in conservation-grounded initiatives. The need to find integrated solutions that result in true sustainable landscapes is becoming increasingly urgent in the face of climate change.

Access to local food and other agricultural products is a key component of a healthy rural economy and social well being in general. Locally grown food also decreases the dependence on imported foods and associated "food miles", which are energy consumptive, and contribute to greenhouse gas emissions and climate change. Furthermore, agriculture is a key component of a vibrant countryside. *"The vast majority of southern Ontario's rural landscape is owned and stewarded by farmers. We must seek solutions that will also fulfill society's need for protected countryside and viable agricultural production, while contributing to "smart growth" solutions to meet the needs of an expanding population. Our work is fostering greener land-use planning and land stewardship will be successful only if we work collaboratively with those who own the land, in particular, farmers. The farm community has expressed its interest in environmental protection through the Environmental Farm Plan program. Many rural natural areas are located on farms, and some farmers are exploring the potential for tangible financial recognition for the environmental goods and services that they provide to society by protecting woodlands, wetlands and waterways on their farms. Common ground must be found and opportunities to collaborate with farmers must be sought."* (Ontario Nature 2006)

Many common ecological goals and priorities exist in conservation and agriculture, including hydrological protection mechanisms, soil erosion prevention, native biodiversity conservation, pest control, and wetland maintenance and enhancement. Protection of these fundamental ecosystem processes will benefit the agricultural community as well as assist in the protection of biodiversity. These common goals have served as a foundation for stewardship initiatives in the

past. There is a long history of collaboration among the agricultural, rural non-farm, and conservation sectors in Ontario. For example, the agricultural sector currently contributes to the protection of natural heritage features through the preservation of woodlands, wetlands and other important habitats. Agricultural lands alone provide important habitat, such as amphibian dispersal habitat and habitat for open country species (TRCA 2007), and ecological functions, such as climate regulation and pollination (Kennedy and Wilson 2009). In addition, the Environmental Farm Plan (EFP) has been very successful in helping Ontario farmers adopt more environmentally sustainable practices (see Appendix 4 for a description of the EFP program). ALUS (Alternative Land Use System) programs have been helpful in recognizing the important societal contribution made be agriculture both in commodity protection and in sustaining the rural landscape.

Suggested Directions

- recognizes that sustainable landscapes ought to include viable agricultural communities;
- find common ground and opportunities to collaborate with famers; and
- include stakeholders from the diversity of groups involved in achieving a sustainable landscape in southern Ontario.

4.13 Agriculture and natural heritage system planning

Conflict between the agricultural and conservation sectors has resulted from some natural heritage system planning exercises.

Summary

In some cases, there are key differences in perceptions of natural heritage systems[4] and sustainable landscape planning among conservation and agricultural organizations. When looking at the individual level, there is a more continuous gradient of land ethics subscribed to. Most citizens and landowners exist on that gradient in terms of their land ethic and actions. Landowners themselves do not necessarily see themselves as exclusively farmers or conservationists. However, at the organizational level, differences typically polarize groups and conflicts often arise and become the focus of dialogue, rather than the commonalities among groups. Despite many examples of positive initiatives, examples of conflict between agricultural and conservation-based organizations are common. For example, agricultural communities often responded negatively to natural heritage system mapping which shows 'green swaths' running through their fields. Such mapping summons feelings of unease and fosters distrust. The cause of concern often lies in the expectation of further restrictions being placed on agricultural practices.

Other issues arise when farmers feel that the burden of natural heritage protection is being placed on their shoulders without acknowledgement or direct financial support from other sectors of

[4] A natural heritage system is an ecologically based delineation of nature and natural function; a system of connected or to-be-connected green and natural areas that provide ecological functions over a longer period of time and enable movement of species; natural heritage systems encompass or incorporate natural features, functions and linkages as component parts (NHRM 2010). Natural heritage system design is the current approach to protecting natural heritage systems based on conservation research.

society. Lastly, the presentation of natural heritage protection initiatives is often interpreted as an accusation that farmers are poor land stewards, whereas they perceive themselves as having maintained natural features on their lands for many generations. Also, natural heritage stewardship activities have historically focused on tree planting which can be viewed to limit options for farmers to generate revenues from their land. Some conservation-based groups are learning that they can achieve important ecological gains, through the help of farmers, by planting prairie and meadow ecosystems instead. This type of ecosystem is often more amenable to the agricultural landscape and traditional agricultural needs. Options for prairie/meadow-based stewardship programs are being countered with stewardship options for sustainable forestry, which arguable provide a much greater long-term economic return.

Suggested Directions
- clearly communicate the intent of the natural heritage system to all stakeholders;
- provide opportunity for farmer and other stakeholder engagement in the natural heritage system planning process;
- consider mapping prime agricultural lands as a designation under the natural heritage system plan to indicate the importance of these lands within the landscape or watershed; and
- conduct research into ecological processes required to maintain high quality agricultural land.

4.14 Appropriate scale to apply targets

Targets and thresholds can be applied at various scales. Ecological targets and thresholds must be considered at the most logical scale and these, in turn, must be integrated with the other facets of sustainable landscapes.

Summary
Ontario as a whole contains greater than 30% forest cover, yet targets are generally set at the watershed or regional scale. What is the most appropriate scale to assess ecological targets? If targets, such as 30% forest cover cannot be reached at the Township or County level, would reaching the target at the watershed, subwatershed or Ecodistrict scale be acceptable? Ecodistricts are based on physiographic patterns which are reflected in differences in land suitability and proportions of natural cover. Providing standard targets and thresholds are provided for broader areas (i.e., broader than an Ecodistrict), such as south and east of the Canadian Shield, would be an interesting point of comparison, as there is likely room for considerable variation between Ecodistricts in any detailed application of specific targets and thresholds for usual planning horizons. The Natural Heritage Reference Manual (2010) supports establishment of different thresholds within a planning area that includes regions with different characteristics. Municipal boundaries are not likely the most appropriate unit to express ecological targets, as they represent political, not ecological boundaries. This discussion must also consider other land uses and the context of provincial-scale sustainability, to balance the need to provide a land base for local agriculture, which is restricted for the most part to southern Ontario.

Suggested Directions
- consider interpreting or applying ecological targets at the Watershed or Ecodistrict level; and

- integrate ecological targets with other aspects of sustainable landscapes in the contexts of local communities and provincial-scale needs.

4.15 Examine incentives for ecosystem goods and services

Many farmers and other non-farm rural land owners may maintain natural areas and preserve vital ecosystem goods and services on their properties. Some countries provide annual incentives to landowners for the ecosystem goods and services provided by their land. Ontario examples of such incentives include the Conservation Land and Managed Forest Tax. In Ontario, incentive payments have been provided for implementing beneficial management practices. But the impact of these practices, other than for clean water, may not always have been conveyed as contributing to the provision of ecosystem services.

Summary

Ecosystem goods and services are benefits that society enjoy from the presence of functioning natural ecosystems. The concept of ecosystem goods and services and the valuation of natural capital provides a means for attaching economic significance to the protection of natural areas. All humans consume ecosystem goods and services for their very existence. Agriculture and forestry use ecosystem services, like solar energy, water and pollination services, to produce their products. In some cases, private landowners may produce net ecosystem goods and services, in other cases landowners may be net consumers of ecosystem goods and services.

Incentives for the ecosystem goods and services provided by natural areas preserved and maintained on agricultural and other non-farm rural lands has been suggested. The concept behind this is that the cost of providing benefits enjoyed by society as a whole should be shared by everyone, thus if a farmer takes land out of production to provide benefits to the community or province, thus reducing his income, it is only fair to share the cost and provide incentives to the farmer. However, some say if a landowner is not reaching a certain level of stewardship or even compliance with laws, no incentives should be offered. This is the question of what is the baseline for performance.

A study completed by Credit Valley Conservation Authority and the Pembina Institute (Kennedy and Wilson 2009) determined the economic value of natural capital in the Credit River Watershed to be at least $371 million per year, $21.4 million of which is supplied by agricultural lands. Agricultural lands cover approximately 33% of the Credit Watershed, while upland forests cover only 12%. Although agricultural lands contribute to the production of ecosystem goods and services, upland forests, by comparison, contribute $70.9 million per year ($49.5 million more than agriculture). These statistics reinforce the importance of protecting natural areas, while also recognizing the multifunctional value of protecting agricultural lands.

In Norfolk County, the Alternative Land Use Services (ALUS) program is being field tested. ALUS has been defined as a delivery program that promotes the provision of ecosystem goods and services by creating an incentive-based mechanism for encouraging resource stewardship by landowners and integrating the environmental demands into the mainstream of agriculture. ALUS offers annual payments of up to $150 per acre for certain natural assets or new practices

on farms. ALUS thus serves multiple goals, linking the economic value of farmland and other rural land to environmental protection through the provision of ecosystem goods and services and the protection of natural capital (CFFO 2005). Perhaps the most important achievement of the Norfolk ALUS pilot project is that it has urban environmentalists talking to farmers about food, habitat and farmland. Many Toronto-based environmental activists have become engaged in farm issues as a result of the Norfolk project. This builds on the increased interest of urban environmentalists in local food production and connecting with where their food comes from. Bridging between these communities is an important social achievement.

Despite the enthusiasm of many people for ALUS, concerns have arisen about the impact of such a model on the stewardship effort, which has largely been voluntary and education-focused to date. If participants of the ALUS program begin to expect payment for the contributions they make, this may dissuade others from voluntarily participating in stewardship initiatives. There are concerns about potential large costs of ALUS. A 2007 study estimated the cost of a national ALUS program at $740 million/year based on assumed annual payments of $20/acre/year, far below the $150/acre/year proposed for Ontario. Similar examples to the ALUS program exist is some other countries, such as the Conservation Reserve Program in the United States, agri-environmental schemes in Europe and the National Forestry Financing Fund in Costa Rica. These types of programs in Europe and the US require enormous annual budgets. In addition, the European programs require a certain level of environmental performance, before payments are provided for additional environmental practices. Many of Ontario's existing incentives have many features of the US and European programs. The Conservation Land and Managed Forest Tax Incentive Programs provide exemption from, or reduction, in property taxes for stewardship of natural features. Some conservation authority programs offer per-acre annual performance incentives for certain practices.

Discussion must occur amongst the community and decision-makers to explore whether payments for ecosystem goods and services might be useful in Ontario, as an addition to the range of tools used in sustainable landscape planning.

Suggested Directions

- determine the risks and benefits of promoting annual payment incentive programs like ALUS for the provision of ecosystem goods and services;
- determine if consensus can be reached on whether or not incentive payments are desirable;
- consider implications of the ALUS model on stewardship as a whole in southern Ontario;
- consider other approaches for encouraging rural landowners to provide ecosystem goods and services; and
- consider a range of alternative incentives for ecosystem goods and services in the context of sustainable landscape planning.

4.16 Confusing terminology

Certain words, particularly jargon, are frequently misunderstood and perceived differently by different sectors and stakeholders involved in sustainable landscape planning.

Summary
There may be impacts associated with terminology currently used in natural heritage and sustainable landscape planning. Certain terms have been used by organizations and agencies over the years, which may become associated with a particular group or project. Caution must be used when selecting terminology for use in multi-stakeholder group meetings to ensure the language used is neutral and is not mistakenly associated with other initiatives that have negative connotations for some stakeholders. The legacy of terminology currently used in sustainable landscape planning might be investigated to determine the impact of its use and the history attached to it. For example, terminology such as 'greenlands' or 'green spaces' currently used in landscape planning initiatives conveys a message of conservation, which may alienate certain stakeholders owing to association (rightly or wrongly) with provincial policy (Greenbelt Plan). This immediately provides an unbalanced playing field for starting discussions on sustainable landscapes in Ontario. The use of confused terminology has the potential to further entrench opposition between and among stakeholder groups and individuals.

Suggested Directions
- compile a dictionary of terms commonly used by planners, farmers, politicians etc. including multiple definitions for an individual term if applicable: 'intensification' and 'new urbanism' are viewed negatively in rural communities, who, at the same time, are trying to draw businesses and population back to their villages and town centers, which is essentially the same thing;
- discuss difficulties that have arisen from past efforts to address conservation planning in terms of terminology, language and effective communication; and
- ensure that commonly understood terminology is used at the outset of stewardship initiatives when addressing sustainable landscape or watershed planning.

4.17 Lessons from grassroots community-based coalitions

There are lessons to be learned from grassroots, community-based coalitions that have effectively integrated the viewpoints of various and widespread stakeholders.

Summary
Small-scale networks and coalitions are forming all across southern Ontario. These organizations, in many cases, are effectively and successfully integrating the perspectives and needs of various stakeholder groups. These organizations may provide useful insights for larger provincial-scale organizations. Various examples from southern Ontario can be drawn upon to showcase how different grassroots community-based coalitions have successfully integrated the voices of various stakeholder groups to address sustainable landscape planning on a local scale. Some case study examples of local-scale responses to sustainable landscape planning are provided in Appendix 5.

In general, these organizations/coalitions/groups strive for three mutually reinforcing functions: the conservation of ecosystems, the fostering of sustainable livelihoods, and human development and the provision of logistical support for research and monitoring (Francis and Whitelaw 2004).

Place-based, grassroots coalitions may offer a useful approach for guiding municipalities and other political jurisdictions along a more sustainable path.

Suggested Directions

- review and summarize lessons learned by these coalitions and determine key elements allowing for successful collaboration and integration of stakeholder groups involved in sustainable landscape planning;
- seek opportunities to initiate and foster local, community based stewardship initiatives;
- identify opportunities for partnership with provincial, watershed or municipal-scale initiatives to deliver programs at the grassroots level; and
- identify new opportunities for collaboration within existing coalitions.

5.0 CONCLUSIONS

A summary of what is involved with achieving sustainability was provided in section 3.0. Economic and societal needs must be grounded in the context of ecological sustainability; yet provisions for a working landscape must be made. Numerous conservation-based strategies have been developed for southern Ontario (see Appendix 3). Most of these strategies have been developed primarily from ecologically derived principles, and from the perspective of natural heritage system planning. To achieve a sustainable landscape in southern Ontario, efforts must reach beyond these ecological priorities to engage other stakeholder groups in the discussion of sustainable landscapes. A number of important case studies highlight examples where opportunities for partnership have been realized (see Appendix 5). These case studies can be drawn upon for direction and inspiration, and to emphasize the role of voluntary, private land stewardship.

The importance of locally-based initiatives was repeatedly encountered in the research conducted for this report, as was the failure, or at least difficulties encountered, when locally based, inclusive approaches were not used. Local organizations can assist in motivating and engaging members of society, government and other organizations in decision making and community development processes (Edge and McAllister 2009). This is important, largely based on the fact that local knowledge and attachment to a place often equates, or at least encourages, local acceptance within the broader community. This acceptance undoubtedly plays a key role in the quality of outcomes achieved by the particular initiative. These locally-based initiatives provide part of the solution, but stakeholder groups must be cognizant of what can be effective and what is transferable to different scales.

Many approaches to sustainable landscape planning have failed to be truly collaborative, despite the repeated recognition of the need for collaboration. Appendix 3 and 4 provide a review and summary of the number of initiatives and approaches that have stated the need to engage a wide range of stakeholder groups. Local governments and organizations are increasingly becoming aware that they need to actively engage, not just inform, a wider diversity of interests due to the systemic basis of many problems, including those related to the natural environment (Edge and McAllister 2009). This trend has generated some holistic and participatory decision-making approaches. Community-based grassroots organizations are forming across southern Ontario to

address sustainable landscape planning issues using collaborative multi-stakeholder approaches; there are lessons to be learned from these coalitions. In addition, individual landowners are undertaking independent conservation actions and are making large contributions to natural heritage conservation in Ontario. In many cases these individuals do not identify with a particular movement or group *per se*. The role of private landowners and voluntary stewardship is a central focus for SNO, and SNO plays a key role in providing clarity to the intent of stewardship activities.

The effectiveness of multi-stakeholder initiatives depends upon the strength of the local community, which in turn relies upon strong community collaboration and networks capable of learning and adapting to change. Often, effective collaboration is difficult to achieve, presenting numerous challenges, particularly when dealing with multi-faceted and contentious issues that are often inherent in sustainable landscape planning. Conventional approaches to dealing with environmental challenges have historically failed to adequately recognize the interconnections between local decisions and long-term sustainability. A comprehensive understanding of the diverse individuals, communities and interests residing within a particular place, and knowledge about how these actors are affected by and contribute to local conditions is required. This understanding can be gained through an informed and engaged public, together with trustworthy, supportive and inclusive organizations that are capable of learning and promoting collaborative networks. In this light, a shift to catalyzing community empowerment by developing and leading strategic partnerships is required (Dale 2001, p. 132). As an example, Ducks Unlimited Canada historically averages approximately 30 projects per year working in isolation. With four field staff working through 21 community partners, 175 projects were completed over two years (Lynette Mader, DUC, pers. comm. 26 May 2010). "Catalyzing community empowerment" occurs at two levels. Initially, it occurs at the local level, and as this empowerment takes place within a greater number of communities, empowerment can occur at a provincial scale that is capable of affecting positive landscape change.

Attempting to achieve ecological targets and thresholds as described in section 4.1 of this report is extremely important, as they provide opportunities for flexibility, socio-ecological integration, expert input, stakeholder engagement, guide decision-making, and provide a means to evaluate progress, including short-term success (Carwardine et al. 2009). Targets and thresholds must, however, be viewed in conjunction and balanced with other priorities for sustainable landscape planning and consideration of a voluntary, multi-generational approach to address these targets is likely needed. A shift in the mindset for approaching landscape planning may be required. Targets and thresholds that integrate the principles of sustainability must be identified and applied to effectively mitigate and adapt to climate change and associated impacts. Important outcomes have been achieved through multi-stakeholder initiatives as local scales. Voluntary stewardship by private landowners has a significant role in this work. Through these and other combined efforts, steps toward achieving sustainability across southern Ontario will be made.

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APPENDIX 1. SNO'S TERMS OF REFERENCE

Appendix 1. Stewardship Network of Ontario's Terms of Reference

A Request for Proposals

Preamble:

Whereas; The Ontario Expert Panel on Climate Change Adaptation, Report to the Minister of The Environment, November 2009 states that "The issue of climate change impacts and adaptation is of such fundamental importance to the Province now and into the long-term future that nothing less than a broadly conceived, across the board strategy and action plan for climate resilience will suffice", and

Whereas; The Ministry of Natural Resources and the Stewardship Network of Ontario recognize that to address climate change resilience there would be a tremendous advantage in having all of the agriculture and conservation organizations, landowners and interest groups working toward the same goals and objectives on the landscape, and

Whereas; There already exists a great deal of scientific literature on defining ecosystem integrity and the use of criteria, indicators, targets and thresholds to assess sustainability, and

Whereas; It is understood that the pressures of population growth, development, pollution and climate change are challenges not only to the environment but also to the viability of farm economies and our quality of life in the long term, and

Whereas; It is further understood that common environmental solutions involving the protection of hydrology, prevention of soil erosion, conservation of native biodiversity and maintaining the presence of wetlands on the landscape are also the foundation for sustaining Ontario's agriculture industry and our quality of life.

Therefore; The partnership wishes to draw attention to the urgent need to work together in Adapting to Climate Change, in part, by drafting a discussion paper on the merits of using targets and thresholds to help convey our message and focus our efforts.

Background:

The Stewardship Network of Ontario is embarking on a project to investigate ways and means of fostering more collaboration between the dozens of agencies, groups, and organizations who are actively managing conservation related programs on the landscape. Under the general umbrella of promoting conservation and natural resource stewardship, many organizations have developed programs specific to their own areas of interest. Ducks Unlimited promotes wetlands, Tall Grass Ontario promotes prairie restoration, Trees Ontario promotes afforestation, woodlot associations promote woodlot management, and Land Trusts seek to conserve biodiversity, ecological integrity and farmlands through acquisition. All of these groups and others seek to engage farmers, rural landowners and planning authorities directly. What is needed is a unifying vision of Stewardship Network of Ontario www.stewardshipcentre.on.ca/
a future desired landscape to focus these efforts on geographic areas of highest need and

environmental goals of the greatest benefit.

The Stewardship Network of Ontario believes that a sustainable landscape is more than a preservation zone. It is a working landscape that includes productive farmland, viable rural livelihoods and urban development that is within the capacity of the surrounding landscape to sustain it. It includes a green infrastructure that supports our quality of life with ecological goods and services such as clean air, abundant potable water, fertile soil, pollination by native insects, climate moderation etc. The Stewardship Network of Ontario's (www.stewardshipcentre.on.ca/) working assumption is that we can do a better job of sustaining the ecological goods and services that we derive from the land if we focus our efforts and work together toward common goals and targets.

A Request for proposals:

Contractors are asked to submit proposals that will assist the Stewardship Network of Ontario to begin the task of bringing together farmers, landowners, planning authorities and interest groups to work toward a common vision of what the landscape of southern Ontario should look like.

The product desired will be an annotated report that provides advice and direction in the following areas:

- The use of ecological targets and thresholds to identify sustainable levels of common criteria and indicators of ecological health.
- Approaches to maintaining and enhancing prime agricultural lands and the viability of farm economies while conserving natural heritage systems.(examples include action plans to improve agricultural economic viability undertaken at regional levels such as Niagara and the Greater Toronto Area).
- The limitations of using targets and thresholds as tools in landscape restoration.
- A summary of success stories and case studies from jurisdictions in the world who have had success in focusing the efforts of a large number of conservation groups on landscape restoration in the context of a privately owned land base.
- Examples of new terminology and other ways of reaching out to landowners and the public in ways not traditional used by the conservation community i.e. if "ecological integrity" targets have not gained traction with the public are there other ways of communicating the same messages (carrying capacity, green jobs, quality of life, etc).
- Advice on new partnerships that have been forged elsewhere i.e. Health, Social welfare.
- An examination of existing knowledge gaps and barriers specific to southern Ontario i.e. ways to promote these approaches.
- Conservation planning optimization software and geographic information systems are increasingly being used for these types of analysis, the paper should include a summary of how such tools are currently being used in Ontario through interviews with key practitioners

References:

At a minimum, the following documents, programs, and projects should be referenced.
How much Habitat is Enough, second edition EC, 2004
http://www.on.ec.gc.ca/wildlife/docs/habitatframework-e.html

National Agri-Environmental Standards Initiative (NAESI), EC 2009 http://www.ec.gc.ca/publications/index.cfm?screen=PubDetail&PubID=944&lang=e

Conservation landscape planning and optimization approaches (for example Sahotra, S., R. Pressey, D. Faith, C. Margules, T. Fuller, D. Stoms, A. Moffett, K.Wilson, K.Williams, P.Williams, and S. Andelman. 2006. Biodiversity conservation planning tools: Present Status and Challenges for the Future. Annual Review of Environment and Resources 31:123–59.)

Greater Toronto Areas Agricultural Action Plan http://www.gtalocalfood.ca/

Niagara's Agricultural Task Force - Securing a Legacy for Niagara's Agricultural Land: A Vision from One Voice http://www.regional.niagara.on.ca/government/initiatives/agtaskforce/default.aspx

Proposals will be judged in part on how broad an investigation is proposed and what additional ideas the prospective contractor can bring to the table.

Follow Up:

It may be instructive for prospective contractors to understand the long term intent of the partnership with regard to this project: The following activities and approximate time lines are envisioned:
RFP process completed, consultant engaged January 20, 2010
Draft 1 circulated to review team February 28, 2010
Final document received March 15, 2010
Circulation to wide network of partners March-April, 2010
SNO Annual Forum June 8, 2010
Travelling workshops to promote discussion timeline tbd
Facilitated partners meeting to discuss timeline tbd
Development and articulation of a shared vision timeline tbd
Action plans from all partners on how they will use timeline tbd
Common themes and visions in work planning

Project Budget maximum $15,000 including all taxes and disbursements.

Submit proposals electronically to Don Gordon, Chair, Stewardship Network of Ontario nod.gordon@rogers.com. Call Don at 519-439-3709 to discuss. Submission deadline January 15th 2010.

APPENDIX 2. REVIEW OF TARGETS AND THRESHOLDS LITERATURE

Appendix 2. Review of targets and thresholds literature

1. How much habitat is enough? (Environment Canada 2004)

This document provides guidelines for ensuring there is adequate wetland, riparian and forest habitat to sustain minimum viable wildlife populations and help maintain selected ecosystem functions and attributes. The following key guidelines are recommended:

- protect at least 10 percent of each major watershed and at least 6 percent of each subwatershed in wetland habitat;
- at least 75 percent of stream length should be naturally vegetated; and
- at least 30 percent of each major watershed should be in forest cover.

Additional recommendations related to size, type and shape are also made in the document. This document has been widely influential across Canada, and in Ontario in particular. Watershed-based and municipal natural heritage systems often strive to achieve the guidelines set out in this document.

2. Nature Needs Half™ (The Wild Foundation, 9th World Wilderness Congress, November 13, 2010)

The outcome of the 9th World Wilderness Congress held on November 13, 2010 determined that protecting and interconnecting at least half of the planet's land and water is necessary to sustain the health, function and diversity of all life, and to ensure the system's resilience in the face of climate change. They also declare that some ecosystems may require more than half to achieve these outcomes. Recommendations for protecting at least 50 percent of each eco-region are made.

3. The National Agri-Environmental Standards Initiative (NAESI) Biodiversity Theme (McPherson et al. 2009) reports targets and thresholds for natural cover consistent with those presented in How much habitat is enough? (Environment Canada 2004).

Reference	Forest Cover Target (%)	Wetland Cover Target (%)	Riparian Cover Target (%)
How much habitat is enough?	30%	10%	75%
Nature Needs Half™	50%	50%	50%
NAESI's Biodiversity Theme	30%	10%	75%

APPENDIX 3. REVIEW OF SELECTED ECOLOGICAL INITIATIVES

Appendix 3. Review of selected ecological initiatives

1. Toronto and Region Conservation Authority's Terrestrial Natural Heritage System Strategy

The Toronto and Region Conservation Authority's (TRCA) Terrestrial Natural Heritage System Strategy (TNHSS) was created in response to the reduction in vegetation communities and species populations and their distribution as a result of urban expansion in their jurisdiction. The approach used is grounded in extensive data, scientific models and also provides mapping and guidance for achieving natural heritage projection objections over the long term. Prior to the TNHSS, changes in land use were approved on a site by site basis without a larger understanding of natural system and environmental health.

The TNHSS was developed using data and a computer model (landscape analysis model), and involved two steps. The first step evaluated existing conditions and predicted the response of biodiversity to urbanization based on current practices in natural systems protection. Based on the results from the first step, more natural cover is required in the region than currently exists to adequately protect natural heritage values. The second step designed an expanded target natural system, which determined that 30% of the region should be natural cover to sustain existing conditions (protection of all remaining features and restoration of others to achieve the 30% was required).

The TNHSS recognizes that agricultural lands provide important dispersal areas for amphibians and breeding habitat for open country fauna (e.g. American Kestrel). It also recognizes the need for municipalities to balance multiple objectives. The focus of the strategy is, however, on protecting a natural heritage system rather than a sustainable working landscape. The strategy identifies the goal of working with all stakeholders to achieve the target natural heritage system by 2100, but fails to identify who the stakeholders or stakeholder groups are.

http://trca.on.ca/dotAsset/26746.pdf

2. Ontario Ministry of Natural Resources' Conservation Land Tax Incentive Program

The Conservation Land Tax Incentive Program (CLTIP) is designed to recognize, encourage and support the long-term private stewardship of Ontario's provincially significant conservation lands by providing property tax relief to those landowners who agree to protect the natural heritage values of their property. The current tax relief offered in 100% tax exemption on that eligible portion of the property. The program is not a land acquisition program as participating landowners retain full ownership and property rights.

http://www.mnr.gov.on.ca/en/Business/CLTIP/index.html

3. Ontario Land Trust Alliance

The Ontario Land Trust Alliance (OLTA) consists of 33 community-based land trusts across Ontario. The OLTA and its members promote voluntary private land conservation to benefit communities and natural heritage systems alike. Land trusts are non-profit, charitable organizations which focus on the acquisition of land for the purpose of conservation. The lands acquired by land trusts are held in trust for future generations. Land trusts are generally local in scope and most focus on conserving the biological values of land. However, across the continent land trusts have been established to protect scenic, historical, agricultural and recreational lands as well. Together, land trusts across Ontario protect more than 60,000 acres of land for the benefit of local communities and species.

http://www.olta.ca/index.htm

4. Ministry of Natural Resources' 50 Million Tree Program

The Province of Ontario has committed to planting 50 million trees by 2020 to mitigate impacts resulting from climate change and improve natural cover. This initiative is paired with the United Nations Billion Tree Campaign, whose goal is to plant one billion trees worldwide each year. The Ontario Ministry of Natural Resources has partnered with Trees Ontario, a not-for-profit organization committed to the re-greening of Ontario through tree planting efforts on rural lands and in urban areas. The goals of the program are to mitigate climate change through carbon sequestration, increase wildlife habitat and increase the diversity in southern Ontario's landscape. Trees Ontario is working with local tree planting agencies in Ontario to deliver the program. To be eligible, landowners must have a potential planting area that is productive and at least two hectares in size, and the area must not have been defined as a woodland at least 10 years prior. If accepted, landowners must sign a 15-year management agreement to maintain the tree-planting and employ good forestry practices. Landowners must also contribute $0.15 per tree and assume some of the additional implementation and maintenance costs.

http://www.mnr.gov.on.ca/en/Newsroom/LatestNews/240212.html
http://www.treesontario.ca/programs/index.php/fifty_million

5. Carolinian Canada's Big Picture

The Big Picture analysis identified a natural heritage system for Carolinian Canada, based on large core natural areas, other significant natural areas and corridors. It was developed using a combination of data on natural features and a landscape-scale analysis. The outcome of the project is a coarse scale spatial image that highlights existing natural cores and connections, along with targeted areas for restoration and rehabilitation. The outcome of the Big Picture analysis does not guarantee a fully functioning landscape, unlike other natural heritage strategies. It does however suggest that if the Big Picture's vision is adopted the Carolinian ecosystem will be more ecological viable.

The study recognizes that a wide variety of land uses, including agriculture and forestry, can be complimentary to natural heritage protection, but also recognizes that a range of conservation policy tools are required to improve land-use planning decisions, encourage private land stewardship, and facilitate the protection of wildlife and key habitats. Cooperative community action is also referred, yet members or the community are not specifically identified. Specific mention of the need to collaborate to achieve a sustainable landscape was not included in the report.

http://www.carolinian.org/ConservationPrograms_BigPictureMethodology2.htm

6. Ontario Nature's A Greenway for Ontario

A Greenway for Ontario is Ontario Nature's vision for sustainable landscape planning in Ontario. A natural heritage systems approach is promoted to protect species and habitats. The importance of fostering sustainable livelihoods and providing communities and citizens with places to recreate and appreciate nature is also recognized. The Greenway strategy seeks to engage community stakeholders and provincial, regional and municipal governments; however, the focus of the initiative is on working at the local level to engage citizens, farmers, other landowners, conservation organizations, stewardship groups, municipal governments, government agencies and community groups in identifying, protecting and restoring a provincial-scale natural heritage system. Starting in 2006, Ontario nature intends to build these partnerships over five years to lay the ground work for achieving a collaborative natural heritage system for Ontario.

http://www.ontarionature.org/discover/resources/PDFs/misc/greenway_vision.pdf

7. Credit Valley Conservation's Ecosystem Goods and Services Report

This report assesses the economic value of natural capital in the Credit River Watershed using a benefit transfer approach to estimate the flow of benefits from ecological services provided by the watershed. The approach used relies on studies done in other regions, and by transferring and adjusting monetary values for similar ecosystem services from other regions to the Credit. This study estimates that the Credit delivers a constant flow of services to society of at least $371 million per year. Agricultural lands contribute $21.4 million per year (33% land cover) while upland forests contribute $70.0 million per year (12% land cover).

http://www.creditvalleyca.ca/bulletin/downloads/CVC-NaturalCreditReport.pdf

8. Ministry of Natural Resources' Approach to Natural Heritage System Identification

The Ministry of Natural Resources (MNR) has pilot tested a modeling, scenario-based approach for identifying natural heritage systems, which is described the Natural Heritage Reference Manual (2010). In this case, the design of NHS include a number of steps: study area

assessment, establishing objectives, establishing targets, data collection and compilation, modeling and natural heritage system scenarios, expert review and validation of model inputs, scenario selection, refinement of the NHS, implementation, and monitoring. This approach was developed and tested by MNR with the participation of technical experts from other ministries, municipalities, conservation authorities and conservation/stewardship organizations. This project was endorsed by the Natural Spaces Leadership Alliance (see #10 of this section for description), an advisory group of representatives from a wide range of municipal and conservation organizations. Participants in Natural Spaces see natural heritage systems planning as a crucial vehicle for better identifying priorities for conservation partnerships and stewardship projects in future (MNR 2006). Natural Heritage Systems can play an important educational role for landowners, by informing them of the conservation values on their land (MNR 2006).

MNR's pilot studies carried out between 2006 and 2007 demonstrated the importance of engaging stakeholders and planning partners in the design and development of a natural heritage system. The NHRM (2010) states that stakeholder participation during the preliminaries and at strategic points in the process is critical, and that full collaboration among agencies with associated interests is invaluable. According to the NHRM (2010), visioning exercises can promote collaboration and provide opportunities for reaching consensus, thus supporting buy-in at the implementation stage. Visioning for natural heritage systems can be completed using the assumption that efforts such as planning, restoration, stewardship and securement will be used for maintaining and improving natural heritage systems. Identifying natural heritage systems using a methodology that is based on sound scientific theory and method, an understanding of the local planning area, and reliable data will improve the validity of the system and its acceptance among stakeholders.

9. Ministry of Natural Resources' Southern Ontario Land Resource Information System

The Ministry of Natural Resources developed a methodology to create a land cover layer using a program called SOLRIS (Southern Ontario Land Resource Information System) and medium resolution satellite imagery and aerial photography. SOLRIS is MNR's primary data layer for landscape level inventory of natural, rural and urban lands in Ecoregions 6E and 7E, providing a comprehensive inventory between 2000 and 2002. It provides current information for natural heritage planning, environmental monitoring and reporting, and stewardship activities. Of particular relevance is SOLRIS identification of natural heritage features by types (e.g., wetlands as swamp, bog, fen, marsh) based on MNR's Ecological Land Classification for southern Ontario.

SOLRIS was completed in two phases. Phase 1 involved trained interpreters using GIS to identify and record changes in land use for three themes: woodlands, wetland and urban areas. This phase was used to update boundary issues. Phase 2 involved remote sensing and GIS methods to classify woodlands, wetlands and urban areas, while also identifying land cover types for the remainder of the landscape (e.g. agricultural intensity). Phase 1 boundaries were used to increase the accuracy of the Phase 2 classification.

10. Natural Spaces, Natural Spaces Leadership Alliance

Natural Spaces Leadership Alliance consisted of a group of conservation and natural heritage leaders appointed by the MNR. The purpose of the Alliance was to develop a number of program components. The goals of the program were to: (1) support and encourage private land stewardship; (2) protect and restore natural heritage systems in southern Ontario; and (3) provide advice on tools, incentives and policies.

The vision of Natural Spaces is "healthy ecosystems sustaining healthy people and a healthy economy", which is grounded in the goal of sustainability. The approach taken by the Natural Spaces program is much more holistic and integrative than other natural heritage planning initiatives. The guiding principles identified for the project include the following:

- maximize social, economic and environmental benefits;
- recognize the need for strategic pubic investment and incentives to produce desired outcomes on private lands;
- use a "natural systems" or ecosystem approach founded on provincial policy interests to strategically undertake activities;
- respect private landowner interests and work with them on a voluntary basis; and
- recognize that agricultural land uses and other rural activities are an integral part of the southern Ontario landscape and economy.

The outcome of the Natural Spaces program included several components:

- the $6 million Natural Spaces Land Acquisition and Stewardship Program administered through the Ontario Heritage Trust;
- the $2 million Trees Ontario Foundation grant to provide supply and demand coordination for native tree seedling production;
- "Nature Count$", a study commissioned from the Canadian Urban Institute on the socio-economic benefits of natural heritage in southern Ontario;
- the development of a natural heritage systems modeling tool with the participation by expert staff from Alliance organizations;
- "Rural by Choice", a rural non-farm landowner study by Dr. Lee-Anne Milburn to inform stewardship organizations and their activities;
- the pilot Natural Spaces Rural Landowner Stewardship Program, and
- a report with recommendations on voluntary tools, incentives and new stewardship programs.

This program provides many interesting and useful ideas to consider when embarking upon sustainable landscape planning initiatives in southern Ontario.

11. National Agri-Environmental Standards Initiative – BIODIVERSITY THEME

The National Agri-Environmental Standards Initiative (NAESI) was a project between Environment Canada (EC) and Agriculture and Agri-Food Canada (AAFC) (2004-2008). The goals of NAESI included:

- establishing non-regulatory national environmental performance standards (with regional application) that support common environmental goals;
- evaluating standards attainable by environmentally-beneficial agricultural production and management practices; and
- increasing the understanding of relationships between agriculture and the environment.

The Biodiversity Theme in the National Agri-Environmental Standards Initiative (McPherson et al. 2009) provides generalized performance standards for Ecozones in agricultural regions in Canada. The guiding purpose of the NAESI habitat-based biodiversity standards is to determine the critical patterns of land cover that will ensure the continued supply of ecosystem goods and services while conserving the ecosystems, species and genetic diversity typical of a region.

This report recognizes that agricultural land makes a significant contribution to biodiversity. The varied habitats associated with agricultural land provide some or all of the requirements of many wildlife species across Canada (McPherson et al. 2009). However, not all habitat types are equal in their capacity to support wildlife. Wetlands, woodlots, riparian areas, and natural pasture are the most important habitats for wildlife in the agricultural landscape. The goal of the Biodiversity theme was to deliver a suite of measurable standards representing levels of habitat quantity and quality necessary to support biodiversity conservation, applicable to key combinations of agricultural production types and landscapes across Canada.

The Biodiversity theme provides 17 generalized habitat standards that describe natural areas (pest control, pollination, diversity, and connectivity); riparian ecosystems (cover and representation, diversity, and connectivity); forest ecosystems (cover and representation and patch size); grassland ecosystems (cover and representation, patch size, diversity, and buffer); wetlands ecosystems (cover and representation, buffer, and size); and anthropogenic areas (impervious surface and roads). Percent cover recommendations for forest, wetland and riparian areas are consistent with values reported in How much habitat is enough? (Environment Canada 2004).

APPENDIX 4. REVIEW OF SELECTED AGRICULTURAL INITIATIVES

Appendix 4. Review of selected agricultural initiatives

1. Environmental Farm Plans

Environmental Farm Plans (EFP) originated from the Ontario farm community, and farmers have been involved in every stage of program development. EFPs are voluntary assessments of the environmental strengths and weaknesses of individual farms. They are prepared by farm families to increase their environmental awareness and provide opportunities for identifying areas of concern. Action plans with time tables are created to address areas of concern and improve environmental conditions. The EFP program is voluntary and delivered through local workshops. Projects that address environmental risks identified in EFP action plans are often eligible for funding under the Canada-Ontario Farm Stewardship Program and related programs.

The EFP is delivered by the Ontario Soil and Crop Improvement Association (OSCIA) and technical expertise is provided by Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA). Over 35,000 participants have completed EFPs since the program began in 1993, and the program continues to help farmers adopt more environmentally sustainable practices. Since 2005, over 17,000 on-farm environmental projects have been implemented to address risks identified in EFPs. Over $250 million has been invested in these projects including over $150 million of farmers' funds.

http://www.omafra.gov.on.ca/english/environment/efp/efp.htm#intro
http://www.ontariosoilcrop.org/en/programs/programsaboutefp.htm

2. Greater Toronto Areas Agricultural Action Plan

The Greater Toronto Areas (GTA) Agricultural Action Plan, covering the Regions of Durham, Halton, Peel and York and the City of Toronto, was prepared for the purpose of keeping the GTA agricultural industry competitive given the economic, land use and labour pressures faced by farmers in the area. Despite the loss of agricultural land to urbanization, agriculture remains a significant economic activity and way of life in the GTA. The value of sustaining a viable food production industry in the GTA has been repeatedly recognized.

The GTA Federations of Agriculture and the GTA Agricultural Working Group developed the GTA Agricultural Action Plan to address the following themes:

- economic development;
- education/marketing
- land use/policy; and
- accountability and responsibility.

http://www.rpco.on.ca/NR/rdonlyres/cht4xwo6dmkqauucqxq4ahx7qdq7cagkninmj3w3e5gtnnnwsdyzoe2rkd3drymcc3mtkvtry44lpuk7npups6nwre/GTA_Agricultural_Action_Planweb.pdf

3. ***Securing a Legacy for Niagara's Agricultural Land: a vision from one voice***

Agriculture in Niagara is diverse and multi-faceted. The strength, stability and diversity of the agricultural industry is recognized and promoted in this document. Despite the stability and desire to protect a viable agricultural economy in Niagara, this study identified some disturbing trends:

- the number of acres under production is relatively steady, but the amount of rental land being farmed is growing indicating a vulnerability of the land base;
- pressure from foreign competition and increases in the value of the Canadian dollar present economic challenges; and
- pressure for urban expansion and related infrastructure encroach into agricultural areas.

This paper outlines a comprehensive strategy to support agriculture in light of the difficulties the sector currently faces. To achieve this, representatives from a wide variety of agricultural interests were incorporated into a task force. This paper is the outcome of many working sessions, a discussion paper, and consultation.

http://www.niagararegion.ca/government/initiatives/ag-taskforce/pdf/ag-task-force-finalreport.pdf

4. City of Hamilton Agricultural Action Plan: economic viability for the long term

The City of Hamilton supports a large agricultural sector. The importance of this sector is acknowledged, yet it continues to be vulnerable. In this report, vulnerability is attributed to many factors:

- local pressures for growth;
- encroaching urban development;
- government policies;
- economic trends affecting food production;
- world trade issues; and
- aging farm population.

This reports identifies the steps that are required to strengthen and support the agricultural sector in Hamilton. The outcome of numerous consultations and stakeholder meetings identified that to support economic viability of agriculture in the City of Hamilton, a united purpose is required for building widespread support. The report focuses on the following topics: economic development, promotion, strategic development and direction, forming partnerships, and financial tools.

http://www.investinhamilton.ca/images/stories/pdf/HamiltonActionPlanOct-07.pdf

5. Sustainable Halton

Sustainable Halton is Halton Region's growth management and land use response to the province's Places to Grow Plan, the Provincial Policy Statement and the Greenbelt Plan. Although the focus of the study was not strictly on agriculture, it does provide some guidance on how agricultural lands can be dealt with effectively in municipal Official Plan documents. It involved research, public consultation, staff recommendations and Council approval of policy changes to the Region's Official Plan. This study identified Halton's urban growth area, projected to 2031 and also identified lands for preservation, including both natural areas and farmland. Lands for business and residential use were also differentiated, along with plans for roads, transit corridors, utilities and other regional infrastructure. As the title suggests, the plan operates under the premise of sustainability and the thread of sustainable communities is found throughout. It is recognized that with complete and sustainable communities, a reduction of the impacts of urbanization such as air pollution and climate change will be achieved. Other benefits, such as curbing urban sprawl, maximizing infrastructure and the protection of natural resources and the preservation of farmland are also addressed in the plan.

http://www.halton.ca/cms/one.aspx?portalId=8310&pageId=9385#What_is_Sustainable_Halton

6. Agricultural Countryside Strategy, Phase 3 Sustainable Halton Report 3.04

This reports presents a preferred strategy for a sustainable agricultural presence in Halton Region and comments on the implications of the Sustainable Halton strategy for the agricultural community. Furthermore, this report responds to questions raised in the "Sustainable Halton: Agricultural Countryside Vision" report and makes recommendations to reach a preferred growth option for Halton Region. Questions addressed in this report include:

- should a permanent agricultural areas be designated in the PSA?;
- what tools are required to support permanency?;
- what policies are required to ensure that agriculture can co-exist harmoniously with an enhanced NHS and protected aggregate resources?;
- how should the relationship between agriculture in the Greenbelt and the PSA be enhanced?;
- how should other rural uses be addressed?;
- how large an agricultural area should be established?; and
- where should this area be?

This report lays out recommendations for managing agricultural resources along with a framework for a strategy to provide agriculture with the support it needs to remain viable. The report recognizes that agriculture has remained viable in Halton but is currently at a critical juncture. The report provides a strong and comprehensive strategy to support the sector, which is necessary to sustain the strong presence of agriculture in the Region.

http://www.halton.ca/common/pages/UserFile.aspx?fileId=18615

APPENDIX 5. CASE STUDIES OF COLLABORATIVE APPROACHES TO STEWARDSHIP

Appendix 5. Case Studies of Collaborative Approaches to Stewardship

CASE STUDY #1: Caring for the Moraine Project

The Caring for the Moraine Project works with landowners and an array of non-government, government and other agencies and organizations for coordinated delivery of land stewardship activities (Caring for the Moraine website). Landowner involvement in stewardship on the Moraine is vital, as 90% of the land base is privately owned. Key to the success of the program is working collaboratively to reduce confusion by landowners on the delivery of these programs (Gavine 2010, pers. comm.).

A restoration analysis was completed through the Oak Ridges Moraine (ORM) Foundation and the Ministry of Natural Resources to determine areas where the largest gains in ecological function could be achieved. This analysis was completed using a GIS model. Results from this process identified 18 conservation priority areas, which were then scaled back to 4 main areas for stewardship program delivery. Partners were then pulled together in the 4 main areas, who then coordinated stewardship efforts at a local scale which assisted stewardship practitioners in understanding the nuances of landowners in their particular area of program delivery. The Foundation took this multi-partnered approach to deliver education and stewardship programs across the ORM using a coordinated approach (Gavine 2010, pers. comm.). Caring for the Moraine provides ORM landowners with free property visits, technical advice, workshops, resource materials and financial assistance with the goal of enhancing the ecological health of the moraine (Caring for the Moraine website).

Over the years, Caring for the Moraine has delivered the support of 30 conservation and environmental organizations to more than 80,000 landowners (Caring for the Moraine website). The aim of this collaborative effort is to conserve the moraine's important natural features. Caring for the Moraine operates by making landowner resources on the topics of stewardship and the ORM available to landowners. Property visits can be scheduled with local conservation experts, landowner workshops on topics relevant to rural landowners are offered, as are programs specific to natural cover enhancement through tree planting and prairie restoration, and water system protection through riparian plantings and wetland enhancements. Perhaps the most innovative stewardship approach offered by the Caring for the Moraine project is their "project areas map" which provides a valuable resource for landowners to quickly view what stewardship initiatives are relevant to their properties.

In general, the Caring for the Moraine project's objectives are to increase natural cover, protect water resources, and raise landowner awareness about the ORM. To date, the Caring for the Moraine project through partnership with ORM landowners has accomplished the following gains in natural cover and stewardship activities (Caring for the Moraine website):

- 430,000 trees planted over an area of 220 hectares;
- 225 hectares of prairie restoration;
- nearly 13,350 meters of stream restoration;
- 14.6 hectares of wetland created (and an additional 2 hectares enhanced);
- 6,300 landowner letter mailed resulting in 430 visits to ORM properties; and
- participation of 1,700 landowners in 45 workshops.

The Caring for the Moraine project has successfully collaborated with various agencies, sectors, and individuals to implement stewardship projects across the moraine. Collaboration and integration of resources has allowed for the successful rollout of many projects and activities that may otherwise have been missed. Mapping tools and ready access to information are keys to success in stewardship on the ORM, as is the willingness of ORM landowners to participate in stewardship activities. Perhaps most importantly, leadership of the Foundation was key (Gavine, 2010, pers. comm.).

Caring for the Moraine. http://www.moraineforlife.org/living/living_caring.php. Accessed April 28, 2010.

Gavine, Kim. 2010. Caring for the Moraine. Personal communication.

CASE STUDY #2: Upper Thames River Conservation Authority's Collaborative Action Approach to EFP Group Planning

The Upper Thames River Conservation Authority's (UTRCA) Conservation Services Unit provides one-on-one landowner contact to deliver an array of services on the agricultural landscape. The purpose of this Unit is to work with landowners to improve and protect the overall health of the watershed. The long term goal of the Unit is to build on the collective efforts and actions of landowners in each subwatershed through collaborative action. To achieve these goals, dedicated, knowledgeable and technically proficient staff that are supported by a network of resources is required (UTRCA 2009).

UTRCA has developed a Collaborative Action Approach to Environmental Farm Plan (EFP) Group Planning as a method for delivering the EFP throughout its watershed. The main purpose of the Collaborative Action Approach is to investigate the suite of stewardship activities that could be used to augment current EFP promotion and delivery methods. Through the work that UTRCA supports, significant gains in the Greencover component of the EFP have been achieved. UTRCA have undertaken community-based watershed strategies to bring together technical and cultural objectives to create consensus around action plans. The belief behind this approach is that involving community members will result in the creation of the very best strategy (i.e., one that will be implemented over the long term). According to UTRCA (2009), the purpose of a community-based watershed strategy is to build partnerships among community stakeholders to:

- prioritize environmental concerns of the local watershed communities;
- identify gaps in information and further research needs;
- identify activities to address the environmental concerns and research needs; and
- build local frameworks for ongoing implementation of the identified activities.

The following steps are involved in UTRCA's approach to community-based watershed strategies:

1. target a watershed;
2. assign a lead agency;

3. create a technical advisory team;
4. research the watershed;
5. research the community and prepare communication products;
6. hold public meetings;
7. form a local advisory committee;
8. create a timeline; and
9. develop a community-based watershed strategy development.

According the UTRCA, the community-based watershed approach is an important component of delivering stewardship programs in an effective manner. Approximately five years of collaboration are required to make a difference in the rate of adoption of stewardship activities in a targeted watershed, as time is need to develop relationships, provide individual technical assistance and establish demonstration sites to showcase stewardship activities (UTRCA 2009). Furthermore, readily available technical assistance increases stewardship adoption rates by other landowners.

In UTRCA's *"Collaborative Action Approach to EFP Group Planning – Final Report"* (2009), a case study of the Upper Avon River Conservation Club is provided to elaborate on the effective stewardship strategies undertaken in the watershed. The Upper Avon River Conservation Club was formed in 1193 based on an extensive watershed plan called the Avon Valley Plan written in 1952. The intent of this plan was to preserve and protect watershed health for future generations. Two maps were included in this plan: a 'wish list' of prime tree planting sites, and a 'special farm practices' map where beneficial management practices could be employed. In 1993, UTRCA obtained funds to enable them and the Upper Avon River Conservation Club to undertake community-based conservation work in the Upper Avon watershed. A subwatershed approach was initiated to target one tributary at a time to provide the group with focus and a plan. Their efforts have achieved great success in the watershed, with stewardship activities ranging from planting windbreaks and bufferstrips, to bird box installation, shoreline restoration, woodland management tours and the printing of regular newsletters and flyers to keep local community members up-to-date with stewardship activities in the watershed.

According to UTRCA (2009), reasons for the successful operation of stewardship activities in the Upper Avon River subwatershed over the past 17 years include:

- historical presence and deep understanding of local watershed culture;
- community champions with strong commitment, who provide local leadership ;
- need for stewardship due to high erosion potential of the farm lands;
- technical, administrative and financial support from UTRCA;
- synergy between landowners,Conservation Club and UTRCA;
- long range plan and goal provided by the Avon Valley Plan and the motto "neighbours helping neighbours to improve the Upper Avon watershed for future generations";
- rural/urban relationships have fostered strong community support; and
- staff continuity, and relationships and comfort level.

This case study provides an excellent example of how stewardship is a people process, requiring commitment from local community members to provide the opportunity for long term success and continuity in stewardship implementation.

CASE STUDY #3: Norfolk County's ALUS Project

The Alternative Land Use Services (ALUS) concept was developed by Keystone Agricultural Producers (KAP), a large farm group from Manitoba, and Delta Waterfowl (DW), a not-for-profit conservation organization. ALUS has the support of many farmers, as well as a wide range of agricultural, non-government, conservation, and government organizations including the Canadian Federation of Agriculture (MacKenzie 2008). The ALUS concept is a farm support program that aims to provide financial compensation to farmers for their ecosystem goods and services outputs, with the aim of increasing the production of these outputs. Ecosystem goods and services targeted by the program predominantly include: water filtration, biodiversity, and carbon sequestration. Farmers are encouraged to enroll natural and other areas into ALUS, and are given the choice as to whether lands are kept in a natural state with no agricultural use, or maintained to some degree in non-intensive agriculture (e.g., haying or grazing). For each enrolled acre, the producer receives a variable per acre payment (McLaren 2006).

The objectives of ALUS fall into three broad categories: (1) conservation and environmental enhancement; (2) promotion of sustainable rural communities; and (3) agricultural income enhancement and adaption. The approach operates under the assumption that ecosystem goods and services are public goods, and it is unfair for farmers to bear the cost of producing, restoring and conserving them. The aim of ALUS is to introduce the concept of *ongoing* payments for these public goods.

ALUS involves the farmer in the process and operates under the following fundamental principles:

- voluntary program;
- 20% cap on land eligible for program of each participating landowner;
- integrated with existing delivery systems;
- targeted to environmentally sensitive sites;
- flexible (based on 9-year contracts, modifiable every 3 years); and
- not influenced by government regulation.

The ALUS program recognizes the active role that farmers can play in environmental protection, and proponents of the approach believe that it is more likely to encourage farmers to produce a wider range of positive environmental benefits. Agricultural practices that qualify for the payment through the ALUS program include: grazing management using rotation; green manure crops to improve soil quality; crop residue management; conversion of land to conservation cover for longer than one year; creation of forage reserves, deferred harvesting of forage areas to accommodate nesting of birds; riparian area management; wildlife management zones; carbon sinks; and conservation or creation of water storage areas or wetlands (PQ 2005, p. 38). These practices are grouped into annual, multi-year and permanent commitment categories. These practices focus on marginal farm land for the production of ecosystem goods and services to ensure that agriculturally productive lands remain available.

Local partners have been recruited to implement ALUS pilot projects across Canada, including one initiated in Norfolk County in southwestern Ontario. The Norfolk Federation of Agriculture and the Norfolk Land Stewardship Council have taken the lead in developing and promoting the Norfolk ALUS Pilot Project. A proposal was published in January 2004, describing activities to be funded with the total cost of the pilot project estimated at $7.65 million over 9 years (MacKenzie 2008). Several ALUS demonstration farms are now established and hosting tours for the public and potential farmers. A partnership between the pilot project and the University of Guelph has also been developed to ensure environmental monitoring and assessment of the project objectives, as well as the effectiveness of program delivery. The Norfolk ALUS Pilot Project is administered at the local level through agencies managing crop-insurance programs, rather than centrally through governments and/or major organizations.

CASE STUDY #4: Rural Lambton Stewardship Network's Tallgrass Prairie Program

The Rural Lambton Stewardship Network's Tallgrass Prairie Program started as a government pilot program in 1993. At the time, Ontario-based native prairie seed was not available so the organization began growing up seed for use in their restoration projects (Ludolph 2010, pers. comm.). In 1995, the Network became a provincial program for stewardship.

Rural Lambton Stewardship has 412 acres planned for restoration in 2010, and are supplying seed for over 220 acres of land for the Alternative Land Use Services (ALUS) Pilot Project in Norfolk County. Their program repertoire has expanded outside the Lambton County boundary, based on public demand. Tallgrass prairie restoration work has become increasingly popular, due to a number of different reasons (Ludolph 2010, pers. comm.):

- the abundance of native wildflowers that establish as a result are appealing to many landowners and jurisdictions;
- prairie-based vegetation communities are important for many species-at-risk recovery programs;
- prairie-based vegetation communities provide important habitat for game birds (e.g., grouse and pheasant);
- farmers are interested in tallgrass prairie vegetation as an alternative crop for biofuel;
- scientists are extracting chemicals from tallgrass prairie vegetation for use in herbals and medicines;
- prairie communities are planted alongside other traditionally grown crops for the benefits they provide, including the attraction of beneficial insects and pollinators which provide pest management and pollination services;
- prairie communities dominated by native warm season grasses provide good pastures for later in the summer months when non-native cool season grasses have died off and browned, increasing productivity and cutting costs for farmers;
- prairie plantings are used in roads management as living snow fences and to cut down on weeds;
- prairie plantings are used as buffers for streams and agricultural drains to cut down on erosion and improve water quality; and
- prairie vegetation sequesters just as much carbon as temperate forests, sequesters carbon more quickly, and is more versatile in terms of where it can be planted.

The Rural Lambton Stewardship Network grows approximately 200 acres of seed crops annually, a number which continues to rise each year. Although popular, prairie restoration work represents approximately 25% of the stewardship work they complete each year; the remainder consists of a mixture of thicket, forest and wetland restoration. They plant just as many shrubs as trees to increase biodiversity and to support a wider variety of wildlife. The Network also assists with prescribed burns and invasive species removal. Through the suite of stewardship activities that they are able to offer landowners, the Network is able to assist people who are encountering difficulties on their land with a wide variety of options. Rather than creating red tape, the organization is seen to assist landowners in fixing problems on their lands.

According to the stewardship coordinator, Ron Ludolph (2010, pers. comm.), the keys to the success of their organization include flexibility, having a network of support within the communities they deliver their programs, and word-of-mouth support from landowners who have worked with Rural Lambton Stewardship in the past. The approach to restoration they use is based on up-to-date science, thus education and communication are also key components in the delivery of their stewardship programs. According to Mr. Ludolph, the most important factor of all is having a good, reputable stewardship product to offer. They guarantee a 100% success rate, and as a result their good reputation has spread by word of mouth, beyond the Lambton County limits.

CASE STUDY #5: Grand River Conservation Authority working with Mennonite community to improve Rural Water Quality

The Grand River Conservation Authority (GRCA) delivers the Rural Water Quality Program (RWQP) within its watershed. The RWQP provides financial assistance to farmers to encourage best management practices that improve and protect water quality. Funded by the Regional Municipality of Waterloo, the objective of this program is to improve water quality in the Grand River and its tributaries in the Region. The program was developed in conjunction with local farming groups, as well as provincial and municipal government agencies (Loeffler 2000).

Through this voluntary program, farmers are encouraged to adopt best management practices (BMPs) that are suitable for their farming operations. BMPs are practical, affordable techniques and approaches to conserving soil, water and other natural resources (Loeffler 2000). BMPs which are eligible under the RWQP include manure storages, milkhouse wastewater storage or treatment, fencing of livestock from watercourses, nutrient management planning, establishment of riparian buffers and retirement of fragile agricultural land. The program provides funds to share the costs of implementing these projects at rates ranging from 30 to 100%, depending on the availability of other funding opportunities.

Mennonites remain the dominant cultural group in some parts of the Grand River watershed, representing approximately 72% of all famers in the Regional Municipality of Waterloo (Fretz 1989 *in* Loeffler 2000). In the Grand River watershed, significant water quality impacts are as common on Mennonite farms as on non-Mennonite operations. On some Mennonite and Amish farms, a serious lack of environmental awareness has been noted. GRCA's experience with

working in conservative communities (including Old Order Mennonites, Old Order Amish, David Martin Old Order Mennonite, and Elam Martin Old Order Mennonite) found that they are not always willing to consider the adoption of new farming practices promoted by government programs, although this varies by group (Loeffler 2000). Furthermore, earlier grant programs have resulted in little participation by conservative Mennonites and Amish. Stewardship program staff thus face unique challenges when communicating with this group. When the RWQP was launched, GRCA staff recognized that special extension efforts were needed to work with the conservative community to achieve important gains in water quality.

According to Anne Loeffler from the GRCA, the first step in overcoming this barrier is to learn as much as possible about the beliefs and customs of the conservative groups. Staff approached the leaders of each conservative group to discuss water quality issues, the program objective, and possible participation by church members in achieving these goals. Through this exercise, GRCA learned that the David Martin Old Order Mennonites are not opposed to receiving government grants, and important connections within the community were successfully made. In addition to the RWQP, funding is now available from the Canada-Ontario Farm Stewardship program through the Ontario Soil and Crop Improvement Association (Anne Loeffler 2010, GRCA, pers. comm.), which has increased the number of stewardship projects in the area. Approximate estimates of the number of water quality improvement projects completed in the watershed by conservative groups include the following (Anne Loeffler, 2010, GRCA, pers. comm.):

- The David Martin community has completed approximately 75 stream fencing/buffer projects and at least 125 manure storages and covered cattle yards;
- The Old Order Mennonite community has completed approximately 50 manure storages and 20 stream fencing/buffer projects;
- The Old Order Amish community has completed approximately 3 manure storages and 10 stream fencing/buffer projects; and
- The much smaller Elam Martin Old Order community has completed at least one manure storage and one stream fencing/tree buffer project.

The various conservative Mennonite communities in the Grand River watershed are clearly adopting stewardship activities and are taking their own initiatives to improve water quality and on-farm stewardship. For example, there are now two trained and Nutrient Management Act-accredited nutrient management consultants who are members of the David Martin community, who are able to provide expertise in manure storage and nutrient management within their communities. GRCA staff have observed that when the farm economy permits, many Mennonites quietly implement stewardship projects which reflect a strong ethic of caring for their families and farms, regardless of the availability of government programs.

Overall, there has been widespread adoption of best management practices to protect water quality in the GRCA watershed Old Order community. While some groups prefer not to participate in official programs, lines of communication between GRCA staff and the farmers on issues such as proper well construction, tree planting, and spreading manure, act as an effective conduit for the flow of information (Anne Loeffler, 2010, GRCA, pers. comm.). These efforts have achieved impressive results. In the Boomer Creek watershed, for example, stewardship efforts have markedly increased local water quality. Mennonite famers have noticed that the

water is visibly cleaner and have linked this improvement to the installation of livestock fencing and the planting of buffer strips. One site on Boomer Creek was sampled for fish in 2002, at which time 204 fish of 10 species were observed. Four years later in 2006, 316 fish of 15 species were observed at the same location (GRCA Boomer Creek Fact Sheet). These results provide excellent examples of how buffer strips can simultaneously increase biodiversity and water quality.

A simple, respectful and straight-forward message delivered personally to the community or landowner provides a non-confrontational approach to resolving important issues such as rural water quality. This example from the GRCA provides an excellent example of the need for locally-based stewardship initiatives.

References:

Fretz, J.W.1989. The Waterloo Mennonites: a community in paradox. Wilfred Laurier University Press, Waterloo Ontario.

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CASE STUDY #6: South Nation Conservation Authority's Stewardship Initiatives

The South Nation Conservation (SNC) is engaged in a number of different stewardship activities within their jurisdiction. Many of these activities utilize multi-stakeholder committees to actively engage community members in stewardship activities. These committees have their own budgets to allocate for fisheries, forestry, clean water, hunting, and communications programs. SNC staff can only implement projects approved by the Board of Directors of SNC, who are appointed by the 15 municipalities in its jurisdiction. This Municipal support is key to their success as an organization (O'Grady 2010, pers. comm.).

1. Water Quality Trading/Clean Water Program

The Clean Water Program offers cost-share grants to watershed residents implementing best management practices that improve or protect water quality. The Program is developed and delivered by a multi-stakeholder Clean Water Committee. The Program is also the delivery mechanism for SNC's water quality trading program, the Total Phosphorus Management Program (TPM). TPM has been recognized as one of the best examples of a water quality trading programs in North America. Ontario is also the first jurisdiction in North America to have water quality trading enshrined in legislation. SNC is proud to have been the pilot for this.

Important factors that have contributed to the success of the program include:

- formation of multi-stakeholder committee
- respect for landowners
- responsibility (including budget) is delegated to committee members
- farmers deliver the program, not paid staff (peer-to-peer approach)
- signed agreement on roles and responsibilities of farmers, government, and municipalities

2. First Nations Engagement

SNC and First Nations of Akwesasne and Pikwakanagan have collaborated on several projects. Black ash (*Fraxinus nigra*) is the source material for a multi-million dollar industry for First Nations, and the project ensured the sustainable management of this rare species. The medicinal plant identification project showed the location of plants used in traditional medicines. Recently, an environmental assessment for a $35 million riverfront development was done jointly with Akwesasne.

Important factors that have contributed to the success of the program include:

- First Nations engagement: projects are a collaboration between partners equally concerned with protection of the environment
- local delivery of stewardship programs by First Nations staff and SNC staff working as one unit, with staff of both organizations working in each other's offices
- understanding the First Nations view of the Earth and how all things are connected
- keeping your word

3. Partnership with Ontario Land Owners Association

In 2006, the Ontario Landowners Association were questioning the validity of SNC. Representatives of the Board met with representatives of the OLA and drafted a joint statement that included the following principles:

- Protect existing sources of drinking water to ensure an adequate supply in the future.
- Agreement that the legislation states that the Conservation Authority's role is to coordinate development of the source water protection plan, and enforcement is delegated to municipalities.
- Landowners have historically and will continue to respect the environment, and will respect all environmental laws that do not infringe upon the fundamentals of justice.
- Issues regarding SNC and the OLA will be brought to the attention of the Chair, Board or General Manager of our respective associations for resolution prior to other avenues being used.
- SNC will respect landowners by having staff contact landowners/occupants to request access; if no permission is granted, SNC staff will leave the property unless an emergency exists and a warrant obtained. Staff will also follow biosecurity protocols as needed
- The public must be engaged in debate, and there should be publicly funded hearings on the Clean Water Act in rural Eastern Ontario to enable citizens to make informed decisions.
- All citizens have the freedom to own, use and enjoy their private property, and have the freedom of opportunity to earn a living from their property. This freedom cannot be

infringed upon, or abridged, for the public good, or for the environment without full, fair and timely compensation. However, as with all other freedoms, none are absolute. No person has the freedom or right to cause harm or injury to another person, their property, the environment or to endanger society.

- Based upon this agreement and the above principles, the OLA supports clean water objectives and agrees that the SNC's experience and locally appointed Board of Directors make it the best suited agency to apply Provincial goals to a watershed

4. Private Woodlot Advisory Program (proposal submitted for Provincial funding)
In the publication "How Much Habitat is Enough?", Environment Canada suggests that to support a functional ecosystem, a minimum of 30% forest cover is required within a watershed. Private ownership (landowners) accounts for over 75% of the forest cover within the South Nation River Watershed. The Private Woodlot Advisory Program aims to promote the sustainable management of existing forest cover and the establishment of additional forest cover to preserve and enhance ecological function in the project area. In addition to forest cover, the partners aim to improve the overall health, diversity and productivity of the forest to ensure the local forest-based economy remains strong in spite of the recent economic downturn. The Private Woodlot Advisory Program will educate woodlot owners and provide some incentive to woodlot owners to retain existing forests and to increase the reforestation of idle land.

Important factors that have contributed to the success of the program include:

- assist landowners in understanding the economic value of sustainable woodlot management
- assist landowners in understanding how to market timber
- provide on-the-ground support to landowners through extension and implementation of sustainable forestry management techniques
- taking several stewardship groups that work on a variety of forestry programs and forming one cohesive group to make decisions collectively

Overall, the SNC has achieved important environmental gains through their various stewardship initiatives by delivering programs at the local-level through local participant engagement and through collaboration with their multiple partners. The examples highlighted above also recognize that resources for implementation and extension of stewardship initiatives are of utmost importance.

References:

O'Grady, Dennis. 2010. South Nation Conservation (SNC), personal communication.

Ontario Ministry of Agriculture Food and Rural Affairs and Ministry of the Environment. 2007. Farm Visit (Biosecurity) Protocol for Staff.