

# Stakeholder engagement: A foundation for natural heritage systems identification and conservation in southern Ontario

by Elizabeth Spang<sup>1</sup>, Christopher M. Lemieux<sup>2</sup> and Silvia Strobl<sup>3</sup>

## ABSTRACT

In southern Ontario, multiple organizations apply various approaches to identifying natural heritage systems (NHS). Natural heritage systems comprise a network of natural features and areas, such as protected areas, forests, wetlands, river corridors, lakes, and meadows, as well as the associated natural processes to be conserved and/or managed for various environmental and public services. The application of a variety of approaches can lead to a lack of connections between natural heritage features across political jurisdictions. To further complicate the situation, not all municipalities have the necessary tools and information available to identify and protect NHS nor do they have the capacity to coordinate designing NHS with neighbouring jurisdictions. To address these challenges, a new approach was developed and tested that engages many stakeholders in the collaborative design of a NHS for an ecologically based landscape that crosses several political boundaries. Engagement is an opportunity to work together on common goals with stakeholders, communities, and citizens to find solutions to complex problems and move beyond the traditional consultation that government has used extensively in the past. We engaged a representative group of stakeholders to design and map a scientifically based, quantitatively derived NHS. The engagement process alternated data preparation and analysis activities with target-setting and decision-making by a diverse group of stakeholders, including municipalities, government agencies, non-governmental organizations, stewardship groups, landowners, and other interests. Throughout the target-setting process, observations and feedback from the stakeholders were collected. This paper both documents a number of lessons learned through the engagement process, and demonstrates that stakeholder engagement in NHS design has great potential to coordinate conservation efforts across political jurisdictions and the varied mandates of several organizations.

**Key words:** alternative scenario development, biodiversity targets, ecological function targets, landscape planning, Natural Heritage System, southern Ontario, stakeholder engagement, systematic conservation planning

## RÉSUMÉ

Dans le sud de l'Ontario, plusieurs organisations suivent des approches différentes pour l'identification des systèmes de patrimoine naturel (SPN). Ces derniers regroupent un réseau d'éléments et de zones naturelles, comme les territoires protégés, les forêts, les zones humides, les rives des cours d'eau, les lacs et les prairies, ainsi que les processus naturels qui leur sont associés et qui doivent être préservés, protégés ou encore aménagés en vue de fournir divers services environnementaux et publics. Le fait d'utiliser diverses approches pourrait empêcher de rejoindre certains éléments patrimoniaux d'une administration à une autre. Et ce qui rend la chose encore plus complexe, c'est que toutes les municipalités n'ont pas nécessairement les outils ni les renseignements pour l'identification et la protection des SPN, ni la capacité de coordonner la création de SPN avec les administrations voisines. Devant ces difficultés, on a mis au point et testé une nouvelle approche qui mobilise plusieurs intervenants dans un effort collectif de conception d'un SPN sur un paysage écologique qui transcende les frontières politiques. La mobilisation donne l'occasion à des intervenants, des communautés et des citoyens de travailler ensemble à l'atteinte d'objectifs communs, en vue de trouver des solutions à des problèmes complexes et d'aller au-delà des consultations traditionnelles que le gouvernement a utilisées abondamment dans le passé. Nous avons demandé à un groupe représentatif d'intervenants de concevoir et de cartographier un SPN sur des bases scientifiques et quantitatives. Le processus d'engagement impliquait tant les activités de préparation et d'analyse des données que l'identification des cibles et la prise de décision par un groupe d'intervenants divers représentant des municipalités, des agences gouvernementales, des organisations non gouvernementales, des groupes d'intendance, des propriétaires et d'autres organisations. Au cours du processus d'identification des cibles, on a recueilli les observations et les commentaires des intervenants. Cet article rapporte à la fois des leçons tirées au cours du processus de mobilisation et démontre également que la mobilisation des intervenants dans la conception d'un SPN offre un fort potentiel pour coordonner les efforts de conservation entre les administrations et les mandats différents des organisations.

**Mots clés :** élaboration de scénario alternatif, objectifs de biodiversité, objectifs des fonctions écologiques, planification du territoire, Système de Patrimoine naturel (*Natural Heritage System*), sud de l'Ontario, engagement des intervenants, planification systématique de la conservation

<sup>1</sup>Southern Region, Ontario Ministry of Natural Resources, 300 Water Street, Peterborough, Ontario K9J 8M5.

E-mail: elizabeth.spang@ontario.ca

<sup>2</sup>Southern Region, Ontario Ministry of Natural Resources, 300 Water Street, Peterborough, Ontario K9J 8M5.

E-mail: chris.lemieux@ontario.ca

<sup>3</sup>Southern Science and Information, Ontario Ministry of Natural Resources, 300 Water Street, Peterborough, Ontario K9J 8M5.

E-mail: silvia.strobl@ontario.ca



Elizabeth Spang



Christopher M. Lemieux



Silvia Strobl

features such as wetlands, areas of natural and scientific interest (ANSIs), woodlands, and valley lands are to be protected from development in some parts of the province. The province designates wetlands, species at risk and ANSIs, but municipalities are responsible for identifying all other significant features. Policy 2.1.2 encourages the use of a natural heritage systems (NHS) approach to maintain connectivity between natural heritage features.

## Introduction

Southern Ontario is a complex landscape, both in social and ecological terms. More than 90% of the lands are privately owned and large areas are subject to intense growth pressures. Many of the original forests, wetlands and grasslands have been lost and the remaining natural areas are often fragmented and degraded. As a result, biodiversity is at risk in southern Ontario. Ninety species are officially listed as endangered, 51 as threatened, and 48 as species of special concern (Species at Risk in Ontario List, O. Reg 72/10). In addition to these challenges, the planning and management framework in southern Ontario can make coordinating conservation efforts difficult.

Multiple agencies, including provincial ministries, conservation authorities, non-governmental organizations (NGOs), and municipalities, are involved in land use planning and natural heritage conservation on the same landscape, often at different scales. Planning decisions are made within political boundaries without coordination with neighbouring jurisdictions or without consideration for the effect on the broader ecosystem. This lack of coordination was highlighted as a limitation of the planning process in the report: *Towards an Ecosystem Approach to Land-Use Planning*.

“The land-use planning process itself reflects activities in a patchwork of municipalities and provincial agencies with restricted jurisdictions, as well as geographic boundaries that are not based on ecological units. Without mechanisms and formal means for coordinating planning across political boundaries, planning decisions will continue to be made without reference to an ecosystem context” (OMOEE 1994).

As well, this lack of carefully planned coordination across jurisdictions remains a major challenge for natural resource management in Ontario today.

Land use planning on private lands in Ontario is governed by the Planning Act (R.S.O. 1990, Chapter P.13). Under the act, municipalities have the authority to conduct land use planning through the preparation of official plans and zoning by-laws. The Province of Ontario provides policy direction on matters of provincial interest in the Provincial Policy Statement (PPS).

The Planning Act requires that all official plans of municipalities must be consistent with the PPS (Planning Act, R.S.O. 1990, c. P.13, s. 26). The 2005 PPS addresses natural resources in Section 2.0: Wise Use and Management of Natural Resources (OMMAH 2005a). However, these policies are largely feature-based. Provincially significant natural heritage

**Policy 2.1.2:** “The diversity and connectivity of natural features in an area, and the long-term ecological function and biodiversity of natural heritage systems, should be maintained, restored or, where possible, improved, recognizing linkages between and among natural heritage features and areas, surface water features and ground water features” (OMMAH 2005a).

The PPS represents a minimum standard. Municipalities are free to go beyond the requirements of the PPS. However, the reality is that many municipalities, particularly small rural ones, do not have the capacity and/or capability to identify significant woodlands or valley lands, much less connections between them. In addition, municipalities must balance all the policies in the PPS, including those related to infrastructure, agriculture, and the building of economically strong communities. To further complicate the situation, not all municipalities have the necessary tools and information available to identify and protect NHS. As well, municipalities are only one part of the natural heritage picture. Agencies, such as conservation authorities, local land trusts, and other NGOs, are involved in conservation activities, stewardship, and land acquisition. Although these activities have the shared goal of protecting critical natural heritage features, they tend to be implemented in isolation. There is untapped potential for all of the key players to develop a common vision and process to support each others’ natural heritage conservation efforts.

Stakeholder engagement has been emerging worldwide as a tool to work toward common conservation goals. Engagement is a way to work together on common goals with stakeholders, communities, and citizens to find solutions to complex problems (Lenihan 2009). Engagement moves beyond the traditional consultation that government has used extensively in the past to seek public input. In the public engagement framework developed by Don Lenihan of the Public Policy Forum, the public is engaged as equal partners in finding acceptable and mutually agreed upon solutions (Lenihan 2009). Engagement’s many benefits include building trust, legitimacy, and ownership (Table 1).

Many scientists and resource managers agree that the involvement of stakeholders is a key factor for successful management of natural resources (Pomeroy and Douvère 2008). Stakeholder engagement has been used for environmental decision-making in a number of different countries, including the United States (Brody 2003, Pomeroy and Douvère 2008), the United Kingdom (Tompkins *et al.* 2008), South Africa (Pierce *et al.* 2005), as well as in British Columbia, Canada

Table 1. Consultation versus Engagement (Lenihan 2009)

Consultation	Engagement
<ul style="list-style-type: none"> <li>• Participants compete to be heard and their views become more polarized</li> <li>• Difficult to arrive at acceptable recommendations</li> <li>• Those who disagree with recommendations often feel the process has failed them, they weren't listened to, or that outcome was already predetermined</li> <li>• Process is not transparent, accountable or responsive to the public's views</li> </ul>	<ul style="list-style-type: none"> <li>• Public and government partner to solve a complex issue</li> <li>• Actions are more reasonable because all parties are accountable for implementing them</li> <li>• Builds relationships, trust, and ownership in the final product</li> <li>• Greater transparency and legitimacy in decision making</li> </ul>

(Sheppard and Meitner 2005). Research also demonstrates that stakeholder involvement can result in improved decision-making for a wide variety of environmental issues (Beierle 2002, Brody 2003). In Ontario, stakeholder engagement is emerging as a way to bring key players together to work together toward natural heritage conservation.

### Working Together to Advance Natural Heritage Systems

In 2005, the Government of Ontario established the Natural Spaces Leadership Alliance (Alliance), a group of 15 conservation and natural heritage leaders appointed by the Minister of Natural Resources. Member organizations deliver conservation, stewardship, and restoration programs across southern Ontario. Some organizations represented agricultural or development interests. The Alliance included municipalities, the Ontario Federation of Agriculture, Dufferin Aggregates, and many conservation organizations, such as The Nature Conservancy of Canada, Conservation Authorities, Ducks Unlimited Canada, Carolinian Canada Coalition, and Ontario Nature.

The core of the Alliance's mandate was to develop, in collaboration with the Ontario Ministry of Natural Resources (OMNR), a program to encourage the conservation and restoration of healthy ecosystems across southern Ontario, through the voluntary and cooperative efforts of landowners, diverse organizations, and governments. Protecting and identifying NHS in southern Ontario was one of the primary goals of the program.

A *natural heritage system* (NHS) consists of a network of natural features and areas, such as protected areas, forests, wetlands, river corridors, lakes, and meadows, as well as the associated natural processes (OMNR 2006). In southern Ontario's fragmented landscape, these natural systems may include areas that need to be restored to function properly as part of a healthy ecosystem.

Natural heritage systems support life (biodiversity) and the well-being of people. These systems improve the quality of life for Ontarians by maintaining clean drinking water, improving air quality, and providing recreational opportunities to enjoy nature in the outdoors. In short, they provide the full suite of nature's benefits (ecosystem services) that our population depends on. Natural heritage systems also play an important role in the health of the rural economies of southern Ontario. The residents of many of these rural communi-

ties rely heavily on the natural assets present for their livelihoods.

Designing NHS and using them for planning purposes is not new. They have been the basis of landscape-scale conservation efforts in jurisdictions throughout the world (OMNR 2006). Regional NHS are being identified more often as the most appropriate approach to sustain ecosystems and the quality of life in southern Ontario. To be able to adopt NHS as the tool for planning and conservation, it is essential to understand what the critical natural areas are that need to be included and where they are located.

Designing landscape-scale NHS can:

- identify important habitats of unusually high conservation value and the surrounding corridors of inter-connected natural habitats,
- inform and support land use planning and resource management decision-making,
- provide a strategic focus for the stewardship of biodiversity, including securing land and restoration decisions (to counteract the fragmentation and degradation of natural areas), and
- play an important role in the education of landowners, by informing them of the conservation values of their lands.

In consultation with the Alliance and an extensive team of technical experts, OMNR developed an approach for identifying landscape-scale NHS (OMNR 2006). The new approach recognized, built on, and supported the earlier NHS work of OMNR and other conservation organizations. These works include *The Big Picture* (Jalava *et al.* 2002), the *Great Lakes Conservation Blueprint* (Henson *et al.* 2005, Wichert *et al.* 2005), and *Natural Heritage Systems Mapping for the Oak Ridges Moraine* (OMMAH 2002) and the *Greater Toronto Area*, which are formally recognized as planning instruments in Ontario's *Greenbelt Plan* (OMMAH 2005b).

The NHS approach developed as part of the *Natural Spaces Program* is science-based, dynamic, replicable, and applicable across all of southern Ontario. The approach was also a departure from traditional expert-based approaches previously used for defining NHS in that it:

- designs NHS at a regional landscape-scale to inform local planning, natural resource management and decision-making;
- builds on specific goals, objectives, and explicit ecological targets that are set in the context of the regional or local landscape;

- uses the best available science and information to set ecological function and biodiversity representation objectives and targets;
- uses a site selection algorithm to produce a variety of options or scenarios for a NHS that are communicated as maps and charts for review and discussion;
- enables comprehensive analysis of the roles of existing natural features and areas, existing land uses, protected areas, and conservation lands towards the NHS;
- can incorporate multiple objectives to identify priority restoration areas;
- can be repeated with updated information and adjusted over time; and
- facilitates integration of the preferred NHS scenario in a geographic information system (GIS) to support mapping of natural feature boundaries for local planning needs.

Ecological boundaries are the most appropriate and defensible scale to use for regional NHS identification. For regional landscape NHS analysis, OMNR built on the successful Ontario Parks model that assesses biodiversity representation in protected areas on the basis of ecoregions and ecodistricts (Crins *et al.* 2009). Ecodistricts are spatial units with similar environmental conditions, such as climate, topography, and geology that have a direct influence on the species, vegetation types, and wildlife habitat found in an area (Crins *et al.* 2009).

The Natural Spaces' NHS approach proposed six steps for designing and identifying NHS (Fig. 1). A guiding principle of the Natural Spaces' NHS approach from the start was to engage stakeholders in the design and development of NHS. Listening to, learning from, and sharing with partners and stakeholders was seen as the best formula for shared success in protecting southern Ontario's natural heritage.

The NHS approach initially proposed included expert review and validation of analysis inputs (Fig. 1, step 4b). Alliance members nominated a representative from their

respective organizations to work with OMNR staff to establish two regional pilot landscape-scale NHS in Ecodistricts 7E-5 and 6E-6 (see Fig. 5). The resulting 11-member Natural Spaces NHS external advisory group met twice with OMNR staff, once to develop the high-level objectives for the NHS and again to review the ecological targets and constraints. Based on the results of these two meetings, the OMNR staff and the external advisory group hosted one focus session for a group of local stakeholders in each of the two regional landscapes.

At the first meeting, the external advisory group obtained agreement on the NHS design goals. The following goals outline the characteristics of what a NHS should include in a particular landscape.

- 1) The NHS consists of a network of natural core areas, regional connections, and local linkages and includes:
  - a. the diversity of ecological communities and native species,
  - b. areas for restoration and recovery including representative and threatened natural areas,
  - c. significant natural heritage features as defined in the PPS,
  - d. known occurrences of species at risk and their habitats,
  - e. protected areas and public lands, and
  - f. sensitive surface water and groundwater features and other aquatic habitats.
- 2) The NHS respects existing and approved land uses.

Using available spatial information, the NHS goals were translated into specific and measurable ecological and socio-political objectives and features. The amount (i.e., an explicit target) for each particular feature was set and expressed as the current area or percentages in the regional landscape or ecodistrict. At the second facilitated meeting of the external advisory group, participants found it difficult to comment on the explicit targets (i.e., percentages) set for each specific ecological objective and feature that were subsequently used as a critical input to the site selection software. The participants were not asked and did not set an overall target for the amount of the total landbase that should be included in the NHS. Instead, they were encouraged to think in terms of the amount of each particular objective and feature that they thought should be included, independent of its interaction with other values. As an example, they might suggest that the NHS include 35% of each existing forest type (e.g., forest on sandy clay loam). They were advised to allow the site selection software to do the accounting work.

One of the key recommendations from the external advisory group was that local stakeholders living in the regional landscape needed to be involved in setting the regional landscape targets. It was recommended that local stakeholders needed to see themselves as one of the many partners in NHS identification and conservation, with the shared goal of protecting healthy ecosystems. Experience has since proven that local stakeholders can contribute very meaningful input to a NHS core analysis team.

The benefits of engaging local stakeholders were apparent at subsequent local focus group sessions in the two regional pilots. Participants reviewed several possible NHS scenarios and the associated socio-political constraints and targets for each ecological objective and feature. They provided practical contributions, including knowledge of important natural area



**Fig. 1.** The key steps and process of the Natural Spaces NHS approach (OMNR 2006).

connections and resounding support for including all provincially evaluated features such as provincially significant wetlands and ANSIs. Participants identified additional ecological objectives that were either included in the analysis (e.g., migratory bird stopover areas) or that were identified for priority data acquisition (e.g., coldwater stream fisheries) to include in future NHS analysis.

Through the experience of the Natural Spaces NHS regional pilots, it became evident that it is essential to involve partners and stakeholders from agencies outside of government in all steps of the process. Setting specific ecological objectives and associated explicit targets and reviewing potential NHS scenarios with local stakeholders results in a shared vision of a future landscape, whether an individual's focus was initially securing land, tree planting, or municipal planning activities. This collaborative and transparent approach was able to address, in part, the lack of coordination across jurisdictional boundaries in southern Ontario.

### A Multi-stakeholder Engagement Process: *The Sustaining What We Value Project*

The multi-stakeholder engagement component of the Natural Spaces NHS approach has continued to evolve. In 2008, a partnership of organizations (including the Eastern Ontario Model Forest, the Frontenac Arch Biosphere Reserve, the United Counties of Leeds and Grenville, Ontario Nature, the Ontario Ministry of Natural Resources, and St. Lawrence Islands National Park), received funding from GeoConnections (Natural Resources Canada) to test the implementation of integrated landscape management. These organizations formed a steering committee for the resulting *Sustaining What We Value Project*. The project aimed to implement the stakeholder engagement process that was conceived through the Natural Spaces Program. The steering committee adopted a grassroots approach to engaging communities and stakeholders in NHS identification. The project also set out to determine whether an integrated regional landscape approach could provide useful information to local decision-makers.

Establishing effective partnerships takes time. The beginnings of the *Sustaining What We Value Project* pre-dated the submission of the project proposal to GeoConnections. Many of the organizations of the steering committee had established partnerships on other initiatives. As an example, the Eastern Ontario Model Forest, the Ontario Ministry of Natural Resources, and St. Lawrence Islands National Park had worked together since 2005 to collect data to develop a comprehensive fine-scale vegetation inventory for Ecodistrict 6E–10. This inventory was a key component of the *Sustaining What We Value Project*, providing much of the data used to develop targets for the biodiversity representation objectives for the natural heritage system analysis. The success of the *Sustaining What We Value Project*, as with all multi-stakeholder initiatives, is largely due to the combined dedication and commitment of all the organizations involved.

The *Sustaining What We Value Project* study area is comprised of two ecologically based regional landscapes—Ecodistricts 6E–10 and 6E–11 (Hills 1959, Crins *et al.* 2009). Early in the project planning, the steering committee realized that completing the project based on ecodistricts presents its own unique set of challenges. Ecological boundaries do not

### Embracing Naturalized Knowledge Systems Thinking

Many organizations and individuals in eastern Ontario, and beyond, have embraced the principles of naturalized knowledge systems thinking. The community at Akwesasne continues to mentor all those interested in these teachings. The successful application of naturalized knowledge systems thinking is reflected in the culture of cooperation that exists in eastern Ontario and in the *Sustaining What We Value Project*. Naturalized knowledge systems also provide a framework for exploring the reasons why partnerships sometimes falter. As well, it offers opportunities to consider how partnerships might be strengthened in the future (Lickers and Story 1997, Holmes *et al.* 2002).

### Principles and tools of Naturalized Knowledge Systems

	RESPECT	EQUITY	EMPOWERMENT
TOOLS	Understanding Communication Consensus Mediation Honour	Finances Knowledge Networks Personnel Social Power	Application Authorship Credibility Partnership Responsibility

Source: F. Henry Lickers, Environmental Science Officer, Department of the Environment, Mohawk Council of Akwesasne

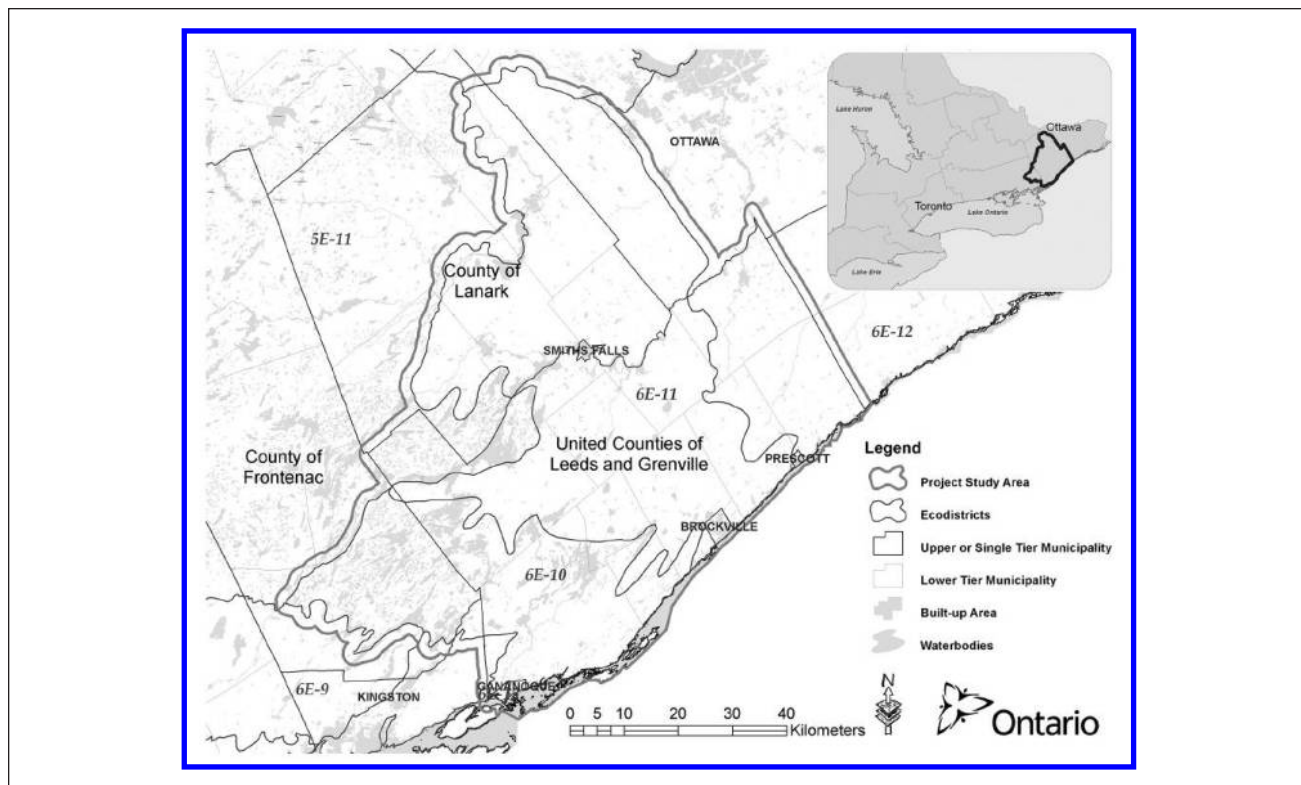
necessarily line up with political boundaries, the first challenge for integrated landscape management. One of the partners (the United Counties of Leeds and Grenville), was interested in obtaining NHS mapping that would include the county's entire jurisdiction. As a result, the project area was expanded to cover the landbase of the entire county (Fig. 2).

### A Process for Multi-stakeholder Engagement

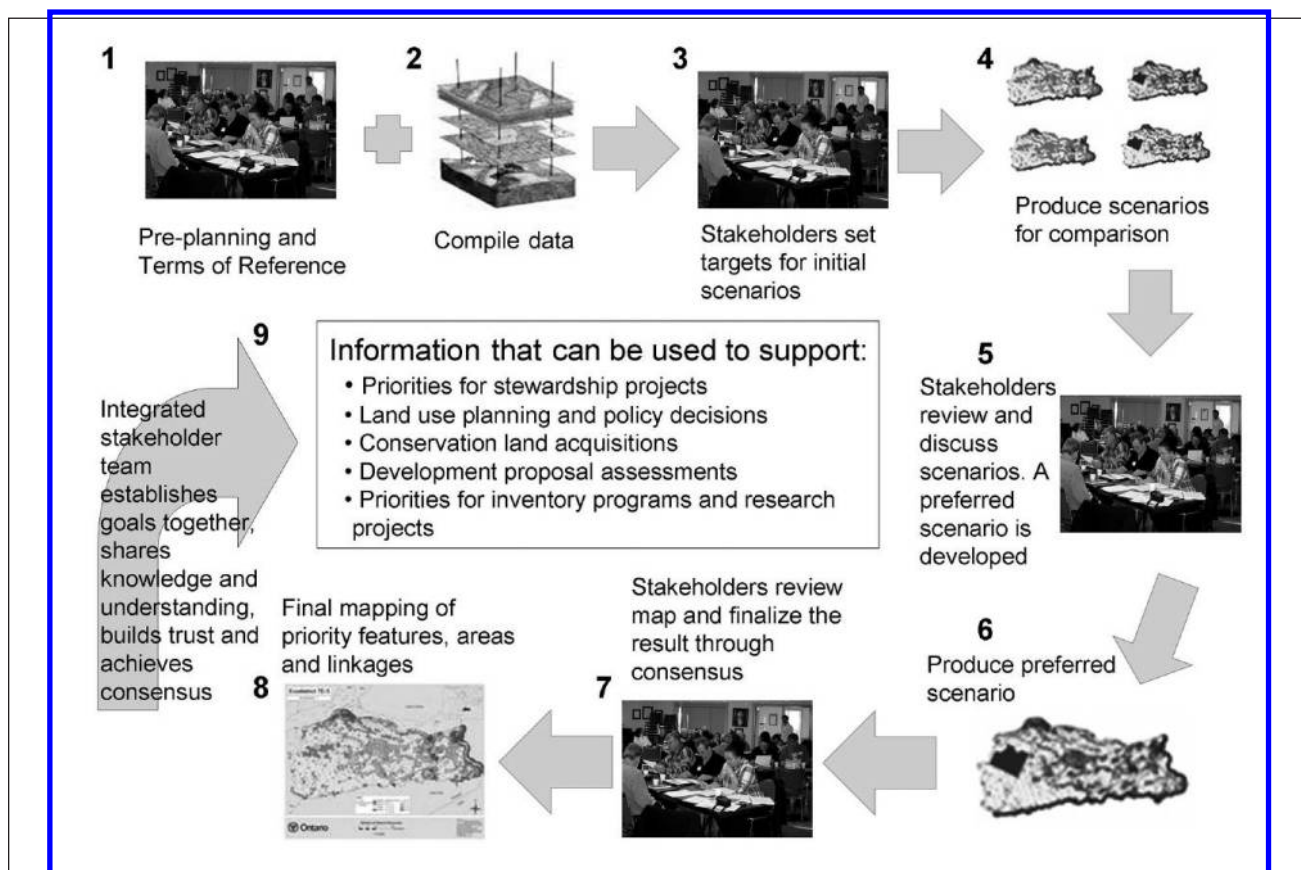
Although the Natural Spaces' pilots recognized the value of engagement, the project timelines did not support more meetings nor was there a formal structure for how engagement could be accomplished. A hybrid process for engaging stakeholders in NHS identification was developed for the *Sustaining What We Value Project* (Fig. 3). It was based on the experience gained through the Natural Spaces Program, the eastern Ontario culture of working together (rooted in naturalized knowledge systems thinking) and Don Lenihan's engagement framework (Lenihan 2009). The engagement process alternates data preparation and analysis activities with target-setting and decision-making by a diverse group of stakeholders, including municipalities, government agencies, NGOs, stewardship groups, landowners, and other interests.

The details of the steps in the process include:

- Step 1—project details such as the study area, the relevant stakeholders, and the values and issues to be included in the NHS are determined. Terms of reference are drafted and agreed upon by all participants.
- Step 2—the data necessary to support the values and issues identified by the stakeholders is gathered and a summary of the current state of the landscape is generated, e.g., how much wetland and forest cover currently exists.



**Fig. 2.** The *Sustaining What We Value* Project study area in eastern Ontario includes Ecodistricts 6E-10, 6E-11 and the remainder of the United Counties of Leeds and Grenville (Source: Ontario Ministry of Natural Resources).



**Fig. 3.** Stakeholder engagement process used in the NHS approach. (Source: Ontario Ministry of Natural Resources).

- Step 3—facilitated target-setting is undertaken by the stakeholders for each of the values included in the NHS. The discussions are supported by the best available scientific knowledge about ecological thresholds. If consensus on a single target cannot be achieved, several different targets can be explored by running “what if” scenarios. These trials allow stakeholders to see the effect of altering a target on the NHS.
- Step 4—all the targets set by stakeholders are put into the site selection software and the learning scenarios are generated for comparison (Puric-Mladenovic and Strobl 2006).
- Step 5—the learning scenarios are reviewed by the stakeholder group. The stakeholders select the best characteristics of each learning scenario to arrive at a preferred scenario.
- Step 6—the preferred scenario is run through the site selection analysis.
- Step 7—the stakeholders review and agree upon the preferred scenario through consensus.
- Step 8—the mapping of priority natural features, areas, and linkages is completed.
- Step 9—implementation: the final NHS can be used to support multiple initiatives, e.g., land use planning, stewardship, research priorities, or strategic land acquisition.

By discussing values and issues and by sharing knowledge and experience, the stakeholder group builds trust and understanding. This trust allows them to come to consensus on a final product, a common vision of the landscape. Each stakeholder can then implement that shared vision within their own organizations. The engagement process is the tool that results in a final product, an agreed-upon NHS that can be used for planning and other conservation activities.

### Planning and Data Compilation

The *Sustaining What We Value Project* implemented the stakeholder engagement process to determine if this type of integrated approach would provide the anticipated benefits. The steering committee held numerous meetings to agree upon the details of the NHS approach prior to engaging the stakeholders. Data compilation had been built into the Geo-Connections proposal work plan and a consultant was hired to harmonize and summarize the data sets across the regional landscape. As well, the Eastern Ontario Model Forest compiled a report listing all the existing data and tools available for NHS analysis (EOMF 2009). The planning work was completed over the course of a year.

### Engaging the Stakeholders

One of the most challenging aspects of the project for the steering committee was deciding on how to select and engage stakeholders. The goal was a workable group of approximately 20 members. The task of selecting members was complicated by the fact that within the study area there are 23 lower and single-tier municipalities<sup>4</sup>, dozens of NGOs, stew-

<sup>4</sup>Municipalities are referred to as “lower tier” when there is another level of municipal government, such as a county or region, involved in providing services to residents. Where there is only one level of municipal government in an area, it is called a single-tier municipality.

ardship groups, government agencies, and other interests. The steering committee committed to a process that was open and transparent. Over a hundred local organizations with environmental, economic, social, cultural, and natural resource use interests were invited to influence the process at a public workshop held in June 2009. Participants were asked to express their interest in being a member of the stakeholder group.

At the public event, the community stated that the stakeholder group should represent a balance of interests, including economic, social, cultural, and environmental, and that it should be facilitated by a neutral third party. The interests represented on this *scenario planning team* (SPT) are shown in Table 2. Despite invitations from the steering committee, there were three notable gaps in the representation of interests on the SPT—First Nations, the development industry, and the aggregate industry. These groups were not able to participate primarily because of organizational capacity. Their lack of participation was not a reflection of disinterest or an unwillingness to be part of the process.

Prior to the first meeting of the SPT, draft terms of reference were developed that identified project goals and objectives, guiding principles, and a governance structure. The first meeting of the SPT served as an introduction to the process to ensure that all members had an equal understanding of NHS and the site selection software tool to be used. The SPT reviewed, amended and agreed upon the draft terms of reference. They also selected a coordinator to facilitate communications between the SPT and the steering committee.

**Table 2. Interests represented on the scenario planning team**

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Area Artist
Cultural
Landowner
Landowner/ Farmer
Stewardship Council/Social
Canadian Land Trust Alliance
Ontario Federation of Anglers and Hunters
Algonquin to Adirondacks Conservation Association (NGO)
Eastern Ontario Model Forest (NGO)
Upper Tier Municipality—GIS
Upper Tier Municipality—Sustainability Coordinator
Municipal Planner/ Lower Tier
St. Lawrence Islands National Park
Conservation Authority
Ontario Ministry of Natural Resources
Ontario Ministry of Municipal Affairs and Housing
Agriculture Federation
Health Unit

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### The Target-setting Process

Seven full-day sessions were held by the SPT between October 2009 and March 2010 to set targets for all of the values to be included in the NHS. Technical advisors from the steering committee prepared a list of values for consideration, based on the Natural Spaces’ pilots and the feedback from the June 2009 public workshop. The advisors also prepared background information on existing science-based thresholds and targets and the data available to support analysis of the values.

The current condition for each value in the study area was evaluated using data prepared in GIS. If a particular expertise (e.g., hydrology) was missing on the SPT, experts were invited to meetings to support the discussion. Where consensus on values could not be reached, alternative “what if” targets were identified for investigation through learning scenarios.

The group considered a range of ecological values including:

- biodiversity representation,
- ecological functions (coarse-scale wildlife habitat),
- fine-scale species habitat, and
- hydrological functions.

These values were the basis for setting 23 ecological objectives and 44 socio-political constraints that were discussed during the seven SPT sessions. Explicit targets or constraints were set for each objective. Socio-political constraints (i.e., existing land uses) were considered with areas identified as conserved, preferred, excluded, or available to the site selection algorithm (Puric-Mladenovic and Strobl 2006). Costs associated with various land uses were added if the stakeholders determined that one type of land use should be more expensive to the optimization process than another (e.g., prime agricultural land). Approximately 27 “what if” questions were identified over the course of the seven meetings. Where data was limited, values were identified for future consideration.

### Produce Scenarios for Comparison

Once all the ecological targets and socio-political constraints were agreed to by the stakeholders, the technical support team provided by the Ontario Ministry of Natural Resources took all the inputs and used a site selection software to identify efficient configurations of sites that best meet the targets. This part of the process is documented in detail in the companion paper, Puric-Mladenovic and Strobl 2012. The alternative “what if” targets and constraints were used to create different NHS scenarios that help stakeholders understand the effects of their decisions on the NHS.

### Reviewing the Learning Scenarios

In November 2010, the SPT started the process of reviewing the learning scenarios and identifying elements of their preferred scenario. This stage of the process involved making trade-offs between what the science-based targets show is needed, and what is acceptable socio-politically. Even with nearly 60% of the landscape in natural cover (wetlands and woodlands), Ecodistricts 6E-10 and 11 still have many areas that are below the ecological thresholds suggested by the literature (e.g., *How Much Habitat is Enough?* [Environment Canada 2004]). This resulted in a baseline scenario that captured 99% of the existing natural cover in order to fully meet all of the targets (Fig. 4). The stakeholders were given information on the most valuable areas within the baseline and encouraged to think about what would actually be feasible to implement and present to political decision-makers. Each learning scenario was evaluated based on how well it met the science-based targets of the baseline-learning scenario. This allowed the stakeholders to make decisions, such as whether a scenario that meets 70% of their targets is the right balance between the science and what is feasible to implement on the ground.

### Observations and Lessons Learned

Throughout the target-setting process, observations and feedback from the stakeholders were collected. As well, the SPT and the steering committee learned a number of lessons through the engagement process.

- **Project planning required a considerable amount of time, even for a group of partners with a history of working together.** The steering committee met for more than a year prior to launching the stakeholder engagement process. The partners required time to come to terms with the steps involved in the process and to understand the interests and expectations of each other and of local community members. The stakeholders benefited from the work that was completed prior to the start of the engagement process, e.g., preparation of the suggested list of values, the gathering of the best available science and the suggestions of initial recommendations for the targets.
- **The benefits of using an ecologically based study area need to be balanced with the desire to engage partners and with considerations of implementation.** The steering committee found that the interests of all parties needed to be considered from the outset to achieve support for the project. The steering committee did not receive the same level of “buy-in” from the municipalities outside of the United Counties of Leeds and Grenville (e.g., Lanark and Ottawa) because the natural heritage system developed would not provide full coverage of their jurisdictions.
- **The NHS approach presents a steep learning curve.** It was challenging for stakeholders to think spatially and to understand the relationships between different objectives. The complexity of ecosystems makes scenario-planning efforts difficult, given that many participants had little or no ecological background. The presence of a highly knowledgeable ecologist as part of the SPT helped to address this issue. As well, a neutral, knowledgeable facilitator helped to move the process along when the group struggled with a concept. The consistent participation and dedication of all SPT members was also critical to success. One of the benefits of such a project is the increased level of knowledge and understanding of the stakeholders by the time the meetings are complete.
- **The stakeholders wanted their decisions to be based on the best available science.** Targets for all 23 ecological objectives were set based on the best available science or on recommendations from subject experts. In some situations, the stakeholders and local experts felt that the available research was not as relevant for this area of Ontario, e.g., 30% as a minimum guideline for forest cover (Environment Canada 2004). Based on their local knowledge and experience, the stakeholders used “what if” questions to explore alternate scenarios in these cases.
- **A picture is worth a thousand words.** Providing stakeholders with maps or images rather than charts and percentages communicated the challenging concepts more clearly (Fig. 5). Explaining target-setting through calculations in Excel tables was not effective.
- **When engaging community members, be prepared to be transparent, flexible and open to their interests.** Innovative solutions may need to be found to accommodate diverse interests. For example, some of the stakehold-



ers believed that natural and cultural heritage are closely tied. As such, both aspects of heritage should be considered to strengthen the final product. The steering committee committed to incorporating any available cultural heritage data into an overlay layer to be superimposed to inform the NHS.

- **Stakeholders are capable of considering each others' views and even the interests not represented at the table.** The stakeholders shared their knowledge and experience with each other and appreciated learning about issues new to them, e.g., incorporating the aggregate industry perspective and privately owned conservation lands into the natural heritage system.
- **Site selection software that uses a mathematical algorithm to find a set of the best solutions gives stakeholders more flexibility to consider seemingly conflicting values.** Stakeholders were able to consider each value and trust the site selection software to balance all the issues. As a result, they were able to consider diverse views, such as those of farmers and the aggregate community, without personal bias.
- **The development of "what if" questions during target-setting helped to ensure that the concerns of individual stakeholders were acknowledged during the exercise.** Learning scenarios offered an opportunity to explore a range of targets and to help move past areas of uncertainty or disagreement. Providing a second opportunity to review and adjust targets when the learning scenarios are reviewed helped stakeholders to agree on a target.
- **A sense of ownership and excitement about the process developed as the meetings progressed.** At some point in the process, stakeholders each had a moment when it all came together for them, and they could understand the relevance of the process and the product. Early on in the process, stakeholders were considering how to communicate the results to a broader audience, from offering to present the final product at their organizations' annual general meetings, to contacting all the municipal councils in the study area.
- **When deciding on a preferred NHS scenario, stakeholders need to make decisions on what trade-offs are appropriate to achieve a result that they all can agree on.** Once the learning scenarios were presented, the stakeholders initially had difficulty deciding what to do with a baseline scenario that captures 99% of the existing natural cover. Once the stakeholders were provided with information on how other scenarios performed relative to the baseline, they were able to discuss which option best balances meeting the targets with being acceptable socio-politically.
- **A tenth step completes the stakeholder engagement process, i.e., incorporating new and improved data.** Throughout the target-setting process, the stakeholders recognized and documented data gaps. They also expressed hope that this process would be repeated in five to 10 years to incorporate new information to ensure that final product remains relevant to decision-makers.

## Conclusions

Based on the results and the lessons learned from the *Sustaining What We Value Project*, the benefits of using a stakeholder engagement process are many. The steering committee suc-

cessfully engaged a diverse group of stakeholders to participate on the SPT. The SPT set all of the targets and constraints for the NHS by consensus and they supported the process. The stakeholder buy-in was evidenced by their levels of ownership and enthusiasm for the process and the offers to present the results to others, including their commitment to an additional, not initially anticipated, meeting to finalize the preferred scenario.

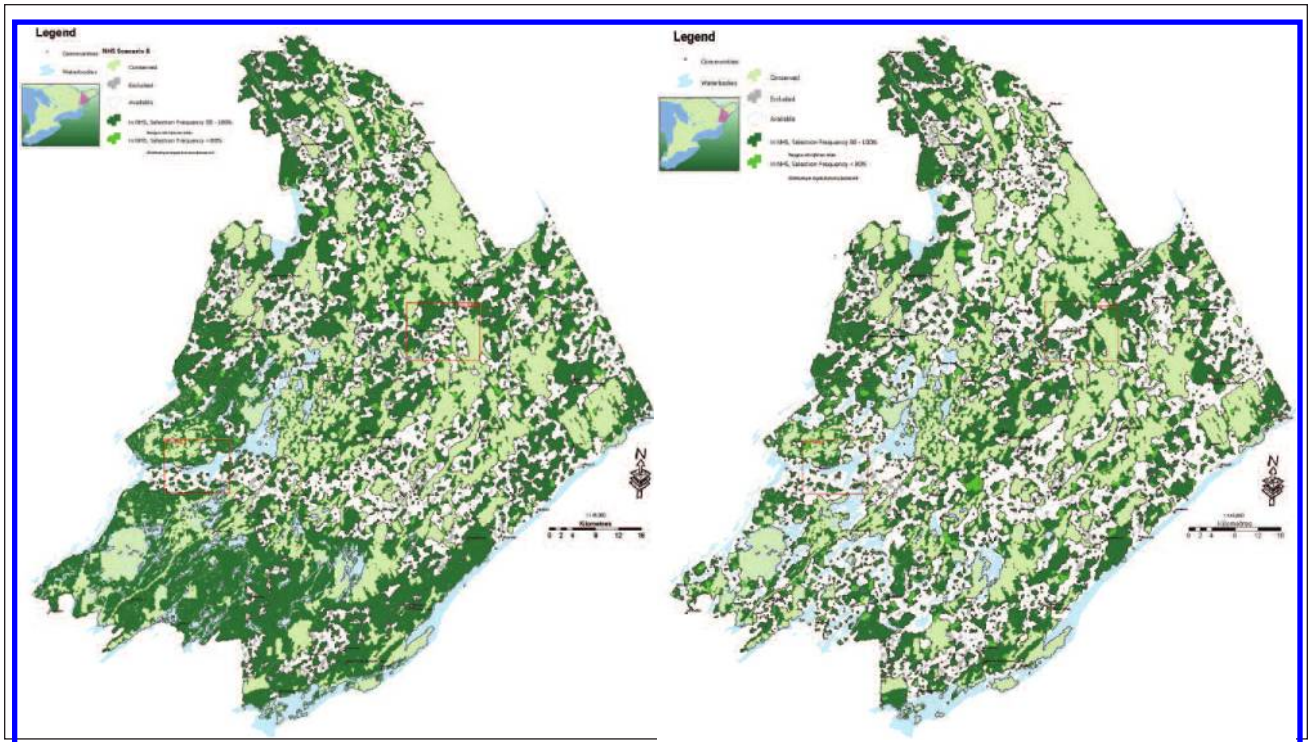
The evidence suggests there is a positive environment for future implementation of integrated landscape management in the study area. Several stakeholders are using the final scenario mapping products to inform their conservation, stewardship and protection activities. The project has shown that stakeholder engagement in NHS identification has great potential to coordinate conservation efforts across political jurisdictions and the varied mandates of several organizations.

Since the inception of the project, several similar projects in southern Ontario have adopted stakeholder engagement to develop regional NHS. The projects include Ecodistrict 6E-15 (Prince Edward County and area), Re-Leaf Hamilton, and the Niagara Peninsula Conservation Authority watershed (Fig. 6). Sharing the lessons learned from the *Sustaining What We Value Project* helped the stakeholder group in Ecodistrict 6E-15 to move through the target-setting process in only five full-day meetings, as compared to the seven days required to go through the process with the *Sustaining What We Value Project*. It is important to note that each stakeholder group in each regional landscape will have its own unique personality and its own set of values and issues. However, the process and the engagement tools used in the *Sustaining What We Value Project* are adaptable to each project's unique circumstances.

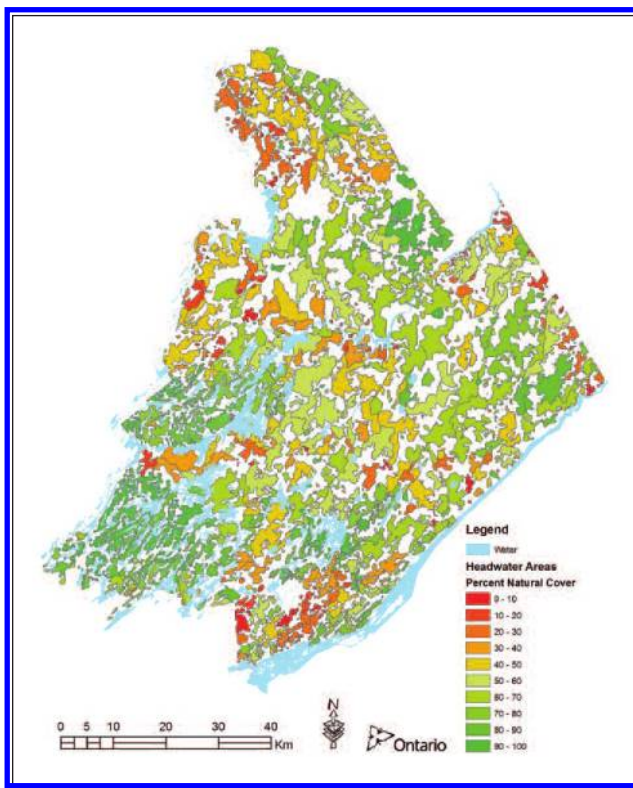
Commitment to partnership-building and to a process rooted in community engagement has resulted in benefits for all parties involved. The positive results of the initiative were instrumental in building legitimacy for and acceptance of the *Sustaining What We Value Project*. This collaborative effort demanded the very best of all partners and its success was dependent on all players accepting equal and critical roles.

Having both government agencies and non-governmental organizations involved in the steering committee produced synergies that would not have existed without their combined participation. While the Ontario Ministry of Natural Resources played a central role in providing credible scientific and technical expertise, non-governmental organizations, such as the Frontenac Arch Biosphere Reserve and the Eastern Ontario Model Forest, were instrumental in making linkages and in generating trust and enthusiasm with the local communities to secure participation in the scenario-planning exercise. Local municipal partners, such as the United Counties of Leeds and Grenville, were also key to making linkages with local information sources and decision-making processes. Municipal partners also have an important future role with the possibility of using the final NHS map to inform local planning decisions.

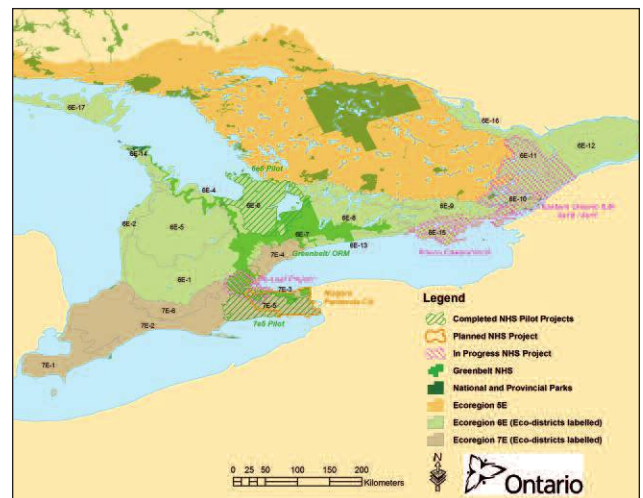
There can be no question that the process of building relationships takes considerable time and effort. For the *Sustaining What We Value Project*, the returns of stakeholder commitment and buy-in justified the investment. It would not have been possible to pursue integrated landscape management objectives without local trust, buy-in, and enthusiasm.



**Fig. 4.** Stakeholders compare the baseline learning scenario (left) to other learning scenarios and make trade-offs between science and what can feasibly be implemented.



**Fig. 5.** Identifying headwater areas that are above and below ecological thresholds (e.g., 50% natural cover) by using intuitive colours helps quickly communicate complex concepts (Source: Ontario Ministry of Natural Resources).



**Fig. 6.** Locations of southern Ontario projects that have adopted stakeholder engagement to set ecological objectives for input to site selection software to identify regional NHS (Source: Ontario Ministry of Natural Resources).

It was equally rewarding to see the passion and desire of the community members to truly understand and meaningfully shape the scenario development process.

Notwithstanding these successes and return on investment, incorporating broader public engagement into projects still remains a somewhat less-traveled road. In eastern Ontario particularly, issues of private property rights—with specific reference to real or perceived fears of intervention and restrictions on activities—may constrain buy-in from the general public. Openness and transparency must serve as guiding principles of any public engagement effort. Only then will such concerns be allayed.

The *Sustaining What We Value Project* entailed a process of engagement that led to mutual learning—the lessons have been many. Above all, the project has highlighted that to be successful one must be patient and committed to community engagement, embracing opportunities to listen, to be responsive, and to learn together by doing.

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