

Natural Heritage Study for the Municipality of Kincardine

VOLUME 2: POLICY & IMPLEMENTATION DISCUSSION PAPER

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prepared for:
County of Bruce

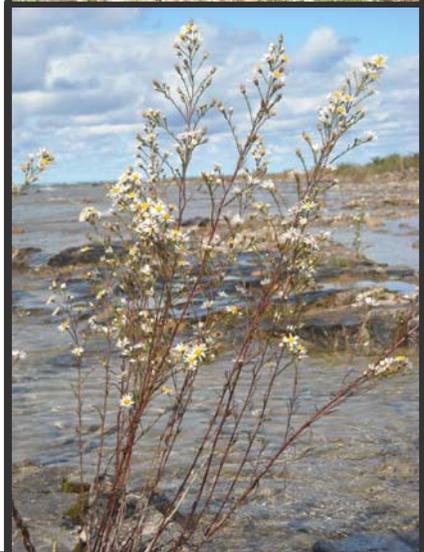
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Note:

The Volume 2 report has been developed by the consulting team with input from the Study Steering Committee and with consideration for some of the input received from the Science Committee and Stakeholders' Group, but has not been reviewed by either of the latter two groups and so they are not listed here as they are in Volume 1 where their input is documented. Notably, this report is not a policy document but rather is intended to be a resource and basis for broader discussion among the key Municipal and County staff, as well as the full range of stakeholders in the Municipality of Kincardine.

EXECUTIVE SUMMARY

In April 2008, North-South Environmental Inc. and Dougan & Associates were retained by the County of Bruce to conduct a natural heritage study for the Municipality of Kincardine. In addition to assessing the local terrestrial natural heritage and developing a defensible methodology for identifying a Natural Heritage System (NHS) in the Municipality, the study was to provide general recommendations regarding an approach for implementing the NHS through policy and other supportive tools.

The characterization of the Municipality of Kincardine's and the County of Bruce's terrestrial natural heritage is provided in *Volume 1: Existing Conditions, Scientific Methodology & Preliminary Natural Heritage System (NHS)* along with the rationale and methodology for applying recommended criteria for identifying a NHS. Mapping of existing natural heritage features and a preliminary NHS for the Municipality is also included in Volume 1 along with appendices detailing all the plant and wildlife records collected (through scoped field surveys and background review) for this jurisdiction.

This report, *Volume 2: Policy & Implementation Discussion Paper*, focuses on policy options and recommendations with respect to implementing the NHS and also includes draft Environmental Impact Study (EIS) and Tree Preservation Guidelines intended to support policy implementation.

The approach adopted for identification of a preliminary NHS, as described and shown in the Volume 1 report, has resulted in identification of a NHS that is somewhat generalized and will need to be subject to refinement as more detailed information becomes available and/or more studies are undertaken in the Municipality. Nonetheless, the recommended criteria and related mapping provide a good basis for ecologically sound natural heritage planning. The key will be in ensuring that the criteria and resultant NHS are carried over into policy so that they are strong enough to ensure a truly sustainable NHS is maintained, while still providing adequate flexibility to accommodate some development in appropriate locations and also be refined in response to new and/or site-specific information.

It is recommended that general and specific NHS policies support protection of the natural integrity and function of the NHS through protection of significant patches and linkages, as defined by application of the recommended criteria. The recommended criteria are, in summary:

1. Patches that contain rare species (NHIC occurrences of federal, provincial, regional and local species) and/or rare communities.
2. Patches that contain natural areas designated in the official plan (i.e. Regional and Provincial Life Science and Earth Science Areas of Natural and Scientific Interest (ANSIs), Provincially Significant Wetlands (PSWs), or Locally Significant Wetlands (LSWs)) and/or ESAs.
3. Patches within:
 - a. 150 m of natural areas designated in the official plan (i.e. Regional and Provincial Life Science and Earth Science Areas of Natural and Scientific Interest (ANSIs)); and/ or
 - b. 750 m of PSWs or LSWs

4. Large habitat patches (i.e., > 7.6 ha in size)
 5. Patches with forest interior
 6. Patches that occur within well-head capture zones or intrinsic groundwater susceptibility areas
 7. Patches that contain an open watercourse or are within 50 m of an open watercourse.
 8. Significant wildlife habitat (SWH)
 - Woodland amphibian breeding habitat
 - Migratory bird habitat (this would include a large area of the lakeshore and riparian corridors inland; see Section 3.4);
 - Colonial nesting habitat areas (e.g., bank swallow colonies, heron colonies)
 - Dune/grassland recovery plan areas
 - Important Bird Areas;
 - Deer wintering yards
 9. Patches with the largest amount of area on each landform and on each surficial geological classification in the County as well as all patches that occur on valley lands identified through Conservation Authority slope stability and erosion lines
 10. Patches that contain the largest amount of the natural vegetation communities as determined by distribution curves of area and vegetation community type.
- Linkages (to be applied after application of criteria 1 through 10)
- 11a. RIPARIAN LINKAGES: Riparian corridors
 - 11b. TERRESTRIAL LINKAGES: Natural linkages that connect otherwise isolated NHS habitat patches across the landscape

In order to provide some flexibility in implementation, it is recommended that patches and/or linkages determined to meet one (or more) of the established criteria may be subject to boundary refinements and review based on site-specific studies. Furthermore, it is recommended that for site-specific studies patches be broken down into the various features that comprise it, and also be evaluated in terms of the criteria being met by (a) the individual features in that patch and (b) the patch as a whole.

This report provides three policy options for each natural heritage feature or function to be addressed. Option 1 goes beyond what might be considered the basic requirements of the Provincial Policy Statement, but is intended to provide the best basis (all else being equal) for the long term protection of native biodiversity within the Municipality of Kincardine. Option 2 is also consistent with the Provincial Policy statement but provides greater flexibility in the implementation of the NHS while also providing assurance of the protection of the significant features and functions that make up the NHS. Option 3 is consistent with the basic requirements of the Provincial Policy Statement, but is the riskiest in so far as it will likely not necessarily provide a sound basis for ensuring the long-term protection of the full range of significant ecological features and functions currently documented in the Municipality of Kincardine. The Municipality may not elect to adopt all the recommendations from a single option, but may choose to select elements from all the options presented to best reflect local priorities and needs.

Policies specifically related to the NHS are supplemented with recommendations for protection and stewardship policies, as well as additional recommendations related to monitoring, voluntary stewardship initiatives and mechanisms for land acquisition.

It has become clear through the Natural Heritage Study process that the Municipality of Kincardine's lakeshore area (i.e., the lakeshore stretching from south of the Geographic Town of Kincardine to MacGregor Point ESA) is biologically rich and diverse and that the significant ecological features and functions present warrant special treatment as a coastal corridor subject to fairly restrictive land use policies. It is therefore recommended that this area be designated as a Lakeshore Coastal Corridor and that special policies be developed that recognize the ecological uniqueness and sensitivity of this area but still allow for some limited types of development in certain types of features, as long as the criteria for which an area was originally designated are not compromised.

Notably, all options assume that EIS are being completed and implemented according to rigorous and comprehensive guidelines. Such guidelines (in draft form) are provided as part of this study to facilitate implementation of the NHS. These guidelines provide specific direction for scoping an EIS and for required components of an EIS report.

Draft Tree Retention Plan Guidelines have also been provided in this study. These are intended for sites outside the NHS with trees on them, as well as areas within the NHS, and particularly within the proposed Lakeshore Coastal Corridor zone where development may be permitted in some locations subject to a tree preservation plan. These guidelines have drawn on current draft tree preservation guidelines developed for other municipalities, and include a rationale and guiding principle, a summary of information required, basic requirements for tree preservation plans, tree protection measures and compensation / mitigation measures.

This Volume 2 report builds on the Volume 1 report by providing specific policy and technical recommendations for effective implementation of the NHS vision and criteria established in Volume 1. However, this report should be considered a resource and basis for discussion rather than a pronouncement of final policy direction for the Municipality. Volume 2 has been developed by the consulting team with general input from the Study Steering Committee and with consideration for some of the input received from the Science Committee and Stakeholders' Group, but has not been specifically reviewed by the Science Committee or the Stakeholders' Group. In order to move this study towards more concrete policy updates, further discussion among the key Municipal and County staff and the SVCA, and broader discussion with a representative range of stakeholders in the Municipality of Kincardine is warranted.

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1.0 INTRODUCTION

In April 2008 North-South Environmental Inc. and Dougan & Associates were retained by the County of Bruce to conduct a natural heritage study for the Municipality of Kincardine. The scope of work was to focus on the terrestrial natural heritage¹ within the Municipality of Kincardine² and developing a defensible methodology for identifying a Natural Heritage System (NHS) in the Municipality. The study was also to broadly characterize the natural heritage of the County of Bruce and provide general recommendations regarding an approach for identifying significant terrestrial natural heritage in the County.

To simplify review and discussion, the report deliverables have been divided into two separate but related reports:

- *Volume 1: Existing Conditions, Scientific Methodology & Preliminary Natural Heritage System (NHS)*
- *Volume 2: Policy & Implementation Discussion Paper*

The characterization of the Municipality of Kincardine's and the County of Bruce's terrestrial natural heritage is provided in Volume 1 along with the rationale and methodology for applying recommended criteria for identifying a NHS. Mapping of existing natural heritage features and a preliminary NHS for the Municipality is also included in Volume 1 along with appendices detailing all the plant and wildlife records collected (through scoped field surveys and background review) for this jurisdiction.

This report, Volume 2, focuses on policy options and recommendations with respect to implementing the NHS, as defined in the Volume 1 report, and also includes draft Environmental Impact Study (EIS) and Tree Preservation Guidelines intended to support policy implementation.

The study Terms of Reference (dated December 17, 2007) emphasized the need for:

- more intensive study and detailed assessment in the identified Schedule C Lakeshore Area (see Figure 3);
- identification of a Natural Heritage System comprised of significant terrestrial features (included forested wetlands) and linkages;
- use of the recently completed Oxford Natural Heritage Study (UTRCA 2006) as the starting point for an appropriate approach and methodology;
- use of existing background and desktop resources to the greatest extent possible, with scoped field assessments to be conducted in the Schedule C Lakeshore Area.

¹ "Terrestrial" natural heritage in this study includes woodlands, wetlands and other open natural and successional communities such as dunes, bluffs and thickets. Hazard lands associated with watercourses are also included for consideration but watercourses and fish habitat are not specifically evaluated as part of this study.

² The recently amalgamated Municipality of Kincardine includes the Geographic Town of Kincardine, the Township of Kincardine and the Township of Bruce / Tiverton.

Notably, the Schedule C Lakeshore Area represents only about half of the Municipality's actual lakeshore area which extends from the Geographic Town of Kincardine to MacGregor Point and corresponds to the areas mapped as "bluffs" (as shown on Figure 3). For the purposes of this report the broader area is referred to as the "lakeshore area" and the focussed study area is referred to specifically as the "Schedule C Lakeshore Area".

1.1 Study Goals

The specific goals of the natural heritage study, adopted from the original Terms of Reference (dated December 13, 2007) were to:

1. Develop, with input from a Science Committee of technical experts, scientifically defensible criteria for the identification of a terrestrial Natural Heritage System (NHS) in the Municipality of Kincardine.
2. Develop a model (through the use of GIS mapping and analysis) that identifies an NHS based on these criteria.
3. Synthesize natural heritage information and present it at a scale that allows for review of proposed EIS guidelines in the context of an NHS for the Municipality of Kincardine.
4. Engage a representative cross-section of local stakeholders in a Stakeholder's Forum to discuss the role of an NHS in the Municipality.
5. Recommend criteria or policy direction for identification of "no development" and "potential development" areas within the Municipality of Kincardine, and specifically the Schedule C Lakeshore Area.
6. Develop site-specific Environmental Impact Study (EIS) guidelines as well as Tree Retention Plan Guidelines.
7. Provide recommendations for the development of scientifically defensible natural heritage Official Plan policies for the Municipality of Kincardine and/or the County of Bruce.

Goals 1 through 4 are addressed in Volume 1 of this Natural Heritage Study, and goals 5 through 7 are addressed in this report, Volume 2.

1.2 Policy & Planning Context

One of the primary reasons for municipalities in Ontario to pursue natural heritage studies is to identify Natural Heritage Systems (NHS) which provide long term preservation of native biodiversity through appropriate natural heritage policy development. The Municipality of Kincardine, like all municipalities in Ontario, is required to develop and implement policies that are consistent with the Provincial Policy Statement (2005). The Municipality is also subject to both the County of Bruce's Official Plan³ which applies to most of the rural, agricultural and hamlet portions of the Municipality, and the Municipality of Kincardine's Official Plan⁴ which covers the major urban and population centers including the Schedule C Lakeshore Area.

³ The County of Bruce Official Plan was adopted May 20, 1997 and approved by the OMB Nov. 16, 1999.

⁴ The Municipality of Kincardine Official Plan was adopted by Council June 7, 2006 and approved by the County Sept. 2007 but is currently under appeal at the Ontario Municipal Board (OMB) (Meridian Planning Consultants Inc. 2006).

The natural heritage components of these policies are summarized in this section and provide some context for the recommendations in this report.

The Provincial Policy Statement (2005), Section 2.1 (Natural Heritage) states that:

2.1.1 Natural features and areas shall be protected for the long term.

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.

2.1.3 Development and site alteration shall not be permitted in:

- *significant habitat of endangered species and threatened species;*
- *significant wetlands in Ecoregions 5E, 6E and 7E1; and*
- *significant coastal wetlands.*

2.1.4 Development and site alteration shall not be permitted in:

- *significant woodlands south and east of the Canadian Shield ;*
- *significant valleylands south and east of the Canadian Shield;*
- *significant wildlife habitat; and*
- *significant areas of natural and scientific interest*

unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions.

Provincial Policy, along with supporting documents and guidelines (such as the Natural Heritage Reference Manual, OMNR 1999 and the Significant Wildlife Habitat Guidelines, OMNR 2000) provide direction on the need for protection and sound guidance on the methods to use to protect (and where required, restore) significant natural heritage features, as well as functional ecological connections required to sustain them over the long term. Volume 1 of this study is a preliminary attempt to identify both these features and the linkages between them to the greatest extent possible with the information available supplemented with the scoped assessments.

The County of Bruce's Official Plan includes general environmental policies as well as numerous special policy areas, particularly along the lakeshore and around inland lakes. It also includes specific policy for the Niagara Escarpment Plan areas that cover a significant proportion of the northern portion of the County. The general environmental policies in Section 4 of the Official Plan recognize the need to identify and protect the County's unique natural heritage in a manner consistent with Provincial Policy.

Specific objectives in the County of Bruce's Official Plan relevant to terrestrial natural heritage protection include (from Section 4.3.1):

- recognize the role of forests and wetlands in ground and surface water rehabilitation;
- protect identified significant woodlands;
- protect natural areas along shorelines and rivers;
- identify, protect and enhance all Provincially Significant Wetlands and Areas of Natural and Scientific Interest (ANSIs);
- identify and preserve areas of environmental or ecological significance;
- encourage the preservation of locally significant Environmentally Significant Areas (ESAs); and,
- protect the habitat of endangered and threatened species.

The County of Bruce's Official Plan also recognizes that other features (i.e., significant ravines, valley, river and stream corridors, significant woodlands, significant portions of threatened and endangered species habitat and significant wildlife habitat) have not been specifically identified and that more detailed mapping of these natural features is required. In the interim, hazard lands, ANSIs and significant wetlands are identified as the primary natural environmental constraint areas.

The Municipality of Kincardine's Official Plan identifies preservation and enhancement of the quality of the natural environment as a primary goal (Section C2.1.1) and reiterates Section 2.1.2 of the Provincial Policy Statement cited above (Section C2.2.3). As in the County of Bruce, the Official Plan recognizes the absence of natural feature identification and mapping beyond Areas of Natural and Scientific Interest (ANSIs) and wetlands, and the need for additional studies to identify additional features (Section C2.2.4).

The Natural Environment section of the Municipality of Kincardine's Official Plan (Section D7) specifically recognizes the main natural environment lands as follows:

- the Penetangore River, its tributaries and their adjacent valley slopes;
- other watercourses that flow to Lake Huron;
- the Lake Huron shoreline;
- the ancient bluffs; and
- other natural heritage features.

Associated hazard lands identified include *"floodplain, wetlands, organic or unstable soils, poorly drained soils and low-lying areas, steep and unstable slopes, and flooding, erosion and dynamic beach hazards associated with Lake Huron"*.

The Municipality of Kincardine's Official Plan further identifies the Penetangore River Valleys and Lake Huron Shoreline as lands to be *"developed as major Open Space area, both for natural environment protection, public use and open space linking Residential and Commercial Areas"* (clause D7.2.4) and espouses the principle that development and site alteration shall generally not be permitted in identified natural heritage features which include valley lands, significant woodlands, wildlife habitat and fish habitat, provincially, locally and regionally significant wetlands, ANSIs and cold water streams.

General policies currently state that development not be permitted within natural heritage features, and that development in adjacent lands will be subject to an Environmental Impact Study (EIS) (Section C2.3). Adjacent lands are currently defined as within 120 m of a significant woodland (Section C2.3.2) and 50 m of a significant wildlife feature (Section D7.5).

Both the County of Bruce and Municipality of Kincardine provide some direction for completion of an Environmental Impact Study (EIS). Existing and additional more specific recommended requirements for an EIS are provided in Section 3.5 of this report

In addition to the applicable policies, there is also legislation protecting Species at Risk (SAR) at both the provincial and federal levels that needs to be considered. Specifically, species designated as Endangered or Threatened in Canada are protected under Canada's *Species at Risk Act* (SARA) which was passed in December of 2002. Notably, the full provisions of SARA only apply to Federal lands, although some provisions, including the protection of the residence of a species are subject to private lands as well.

At the provincial level, Ontario's original *Endangered Species Act* was (first proclaimed in 1971) was recently repealed by Bill 184, the *Endangered Species Act* (which came into force on June 30, 2008). The new *Endangered Species Act (2007)* covers species identified in the Species at Risk in Ontario (SARO) listed as Endangered, Threatened or Special Concern. Notably, the provisions of the Provincial Policy Statement (cited above) protect habitat of provincially Endangered or Threatened species from development without exception, while habitat of Special Concern species may be developed subject to an EIS.

Both the Federal and Provincial governments are currently developing procedures and guidelines for the identification of the habitat of endangered and threatened species which will assist municipalities in addressing policy requirements under the Planning Act.

1.3 The Importance of Natural Heritage Systems

Municipalities in southern Ontario, and elsewhere, are increasingly recognizing that identification of defensible Natural Heritage Systems is a critical component of good planning not only because it is mandated by provincial policy, but also because it is a cornerstone of sustainable and healthy community development, as well as an investment in the maintenance of the green infrastructure that provides valuable ecosystem services⁵.

Over the past few decades there has been a growing recognition of the need to move away from exclusively 'features-based' planning and towards more 'functions-based' natural heritage planning (e.g., Wiens 1995; Haila 2002; Lee et al. 2002). This approach to natural heritage planning recognizes that ecosystems are very complex and that identification of discrete features (such as wetlands or woodlands) does not necessarily capture the full range of habitat requirements for the flora and fauna in a given area, but that these readily identifiable features in

⁵ Green infrastructure is the network of multi-functional open spaces within and surrounding built-up areas including parks, gardens, woodlands, green corridors, waterways, street trees and open countryside (Benedict and McMahon 2002). Ecosystem services refers to the services provided by these natural resources such as carbon sequestration, air quality maintenance, water quality and quantity protection, pollination value, and physical and mental health value (Wilson 2008).

combination with other associated lands provide a more complete range of habitat requirements for a broader diversity for species, thereby contributing to local and regional ecosystem resilience and biodiversity conservation (McIntyre and Hobbs 1999; Oehler 2003; Fischer and Lindemayer 2004).

In the Municipality of Kincardine, designated areas like ANSIs and PSWs are already identified and protected as environmental constraint areas and recognized as some of the most valued natural features in the landscape. However, there are a variety of other ecological features and functions in the landscape that support the Municipality's current biodiversity. The main intent of a Natural Heritage System (NHS) is to try and identify the full range of ecological features and functions that contribute significantly to supporting to Municipality's local biodiversity.

The real challenge is to distinguish those areas which are contributing "significantly" from those that are not given how complex ecosystems are, and how poorly studied they are in agricultural and urbanizing landscapes. One tool used to do this in a transparent and consistent manner is the use of criteria that are based in the current principles of conservation biology and landscape ecology to identify these areas as well as linkages between them.

The basic premise behind having a well-connected natural heritage system is that in the context of a fragmented landscape, connectivity allows for movement of fauna and flora between what would otherwise be isolated habitat patches. Scientific research, and practice, continues to demonstrate that maintaining functional aquatic and terrestrial linkages among fragmented natural habitats ensures greater sustainability than having a number of isolated natural areas (e.g., Forman 1995a,b; Harrison and Fahrig 1995; Fleury and Brown 1997; Beier and Noss 1998; Fahrig 2002). While there is some research demonstrating the potential negative impacts of connecting habitat patches with linkages or corridors (e.g., increased immigration rates may reduce genetic variation among certain populations, facilitate the spread of invasive species to less disturbed habitats, facilitate the spread of disease among core habitats, or increase exposure to predators), and there is much research yet to be done (Goodwin 2003), the bulk of the existing evidence shows that, in a fragmented landscape, the benefits of connectivity far outweigh the potential risks (Naiman et al. 1993; Beier and Noss 1998; Soulé and Terborgh 1999; Kirchner et al. 2003; Environment Canada 2004).

In addition to their ecological value, natural heritage systems are now also being recognized for the ecosystem services they provide (e.g., Benedict and McMahon 2002; Wilson 2008). These services range from stormwater management and air pollution control to recreational value. From a municipal perspective, green infrastructure provides some services which, if eliminated, the municipality would have to replace at additional substantial cost, either directly or indirectly. For example, it is estimated that each year Ontario's Greenbelt removes approximately 60 kg of pollutants per hectare at a value of approximately \$69 million per year. In the case of municipalities like Kincardine, the natural heritage also provides the setting for the local tourism industry which is an important contributor to the local economy. Once the natural heritage systems that provide these services are degraded or removed, it is difficult and costly to replace them. It is much more effective to plan and develop carefully from the outset.

1.4 Study Limitations

Although this study has been based on the best available information, there are a number of key natural heritage information data gaps (particularly lack of knowledge of significant species locations and lack of vegetation mapping) that limited the ability to apply the recommended criteria (as described in Volume 1), and consequently limited the accuracy of the mapping developed. Therefore, the maps developed for this study are useful for providing a landscape scale context and generally identify areas of natural heritage significance but should be considered preliminary and in need of refinement and updating as more comprehensive data becomes available. Although some field data and more detailed analysis was collected specifically in Kincardine's Schedule C Lakeshore Area, allowing for more accurate criteria application in this location, site-specific verification of ecological features and functions still needs to be conducted in this area if and where development is proposed.

This study is intended to support development of natural heritage policy, but is a technical document rather than a policy document. Environmental policies should consider all the information in Volume 1 and carefully weight the options and recommendations provided in this report (Volume 2), but be developed in conjunction with other studies and information (e.g., local growth forecasts and economic opportunities, anticipated servicing requirements, transportation and trails needs assessments, identification of cultural and built heritage, and a study of agricultural and other mineral resources), and with additional consultation with key stakeholders and the broader community.

2.0 OVERVIEW OF THE RECOMMENDED NATURAL HERITAGE SYSTEM (NHS)

Details of how the criteria for identifying a NHS in the Municipality of Kincardine were identified and applied, and a discussion of each, is provided in Volume 1 of the Natural Heritage Study. However, given the importance of these criteria for identification of the NHS and their direct relevance to the development of natural heritage policy, they are re-iterated in this section along with a brief description of habitat patches, the units that are screened for inclusion in the NHS.

2.1 Habitat Polygons and Patches: NHS Building Blocks

The smallest unit types or building blocks within the NHS are the individual habitat polygons identified on the landscape. Polygons can include any of the following:

- Hedgerows (if they support linkages, or are directly adjacent to other natural features)
- Plantations (with identifiable ecological functions)⁶
- Open inclusions (i.e., non-treed communities enclosed by other patches, that are less than 25 m in width and/or less than 25% of the patch area including old fields or marshes)
- Forests (deciduous, coniferous or mixed)
- Shrubs/thickets (not including those still under strong cultural influences such as grazing, etc.)
- Wetlands (swamps, marshes, fens and bogs)
- Aquatic features (lakes, ponds, rivers associated with vegetation communities that can be classified using ELC)
- Sand Barrens, Beaches, Bluffs and Dunes
- Other rare vegetation communities as defined by OMNR or the Great Lakes Conservation Blueprint (Henson and Brodribb 2005)

Notably, polygons less than 25 m apart and of the same vegetation community type separated by drains, rivers, hydro lines, gravel (farm) laneways, firebreaks, ponds or old fields are considered contiguous and part of the same polygon.

These polygons are then used to identify habitat patches, which may be isolated single habitat polygons or assemblages of multiple polygon habitat types forming larger habitat patches. Habitat patches are formed by dissolving all vegetation community polygons into a single vegetation patch as long as they touch one another, or are less than 25 m apart.

Patches consisting of one or more polygons are then screened against the recommended NHS criteria to determine whether or not they should be included in the NHS. All patch criteria are applied to the entire patch, not the individual vegetation community polygons within them.

More details are provided in the Volume 1 Natural Heritage Study report.

⁶ Fruit or nut orchards, and plantations established for the purpose of producing Christmas trees are generally exempt.

2.2 Recommended NHS Criteria

This section summarizes the criteria to be used to identify significant habitat patches and linkages within the Municipality of Kincardine’s NHS. As described in Volume 1, the Oxford NHS methodology (UTRCA 2006) formed the basis for the approach and criteria considered for Kincardine. However, the approach and ultimate criteria recommended for the Municipality of Kincardine were refined and revised based on (a) consideration for how the Municipality of Kincardine’s natural heritage is different from the Municipality of Oxford’s, (b) input from the Science Committee, and (c) input from the consulting team. The recommended criteria, and their associated measures, are summarized in Table 1 below.

Table 1. Recommended criteria (and related measures) for inclusion of habitat patches in the Municipality of Kincardine’s NHS

Recommended Criteria	Measures / Application
<p>1. Patches that contain rare species (NHIC occurrences of federal, provincial, regional and local species) and/or rare communities.</p>	<p>Rare species/communities should include:</p> <ul style="list-style-type: none"> • COSEWIC-designated THR, END or SC • COSSARO-designated THR, END or SC • NHIC ranked S1, S2, S3 or S3S4 • Plant species rare in Bruce County flora (as defined by the list of significant species for Bruce County (Johnson 1990, Oldham 1993)) Regionally rare species as determined by Breeding Bird Atlas (may be updated based on the results of the second Atlas) • Rare species based on DFO fish/mussel information • target vegetation communities identified in the Great Lakes Conservation Blueprint for Terrestrial Biodiversity (Henson and Brodribb 2005) <p>Place a 25 m buffer around all patches (zone of influence)</p> <p>Any record older than 25 years that has not been confirmed more recently is to be excluded on the basis of it being historical.</p>
<p>2. Patches that contain natural areas designated in the official plan (i.e. Regional and Provincial Life Science and Earth Science Areas of Natural and Scientific Interest (ANSIs), Provincially Significant Wetlands (PSWs), or Locally Significant Wetlands (LSWs)) and/or ESAs.</p>	<ul style="list-style-type: none"> • Includes the Municipality of Kincardine and County of Bruce Official Plans. • Designated areas currently include Regional and Provincial Life Science and Earth Science Areas of Natural and Scientific Interest (ANSIs), Provincially Significant Wetlands (PSWs) and Locally Significant Wetlands (LSWs). • Unevaluated wetlands will be protected if they are evaluated and determined to be either a PSW or LSW, and may also be protected if site-specific studies demonstrate that they provide significant wildlife habitat. • ESAs were digitized from existing reports for this study. • Mapping should be informed by the Ontario Nature Greenway mapping.

Recommended Criteria	Measures / Application
<p>3. Patches within:</p> <p>a. 150 m of natural areas designated in the official plan (i.e. Regional and Provincial Life Science and Earth Science Areas of Natural and Scientific Interest (ANSIs); and/ or</p> <p>b. 750 m of PSWs or LSWs</p>	<ul style="list-style-type: none"> • Includes all PSWs and LSWs. • unevaluated wetlands will be protected if they are evaluated and determined to be either a PSW or LSW, and may also be protected if site-specific studies demonstrate that they provide significant wildlife habitat
<p>4. Large habitat patches (i.e., > 7.6 ha in size)</p>	<ul style="list-style-type: none"> • Includes all patches greater than the 75th percentile across the Municipality of Kincardine, including the lakeshore area.
<p>5. Patches with forest interior</p>	<ul style="list-style-type: none"> • Interior is defined as the amount of forest habitat left after 100 m have been removed from the inside perimeter of a forested patch. • There must be a minimum of 0.5 ha of continuous patch interior to be considered interior habitat. • Adjacent forested polygons of different forest types within a patch are treated a single unit for analysis.
<p>6. Patches that occur within well-head capture zones or intrinsic groundwater susceptibility areas</p>	<ul style="list-style-type: none"> • Identified as high-risk by the Source Water Protection Group and >20 ha
<p>7. Patches that contain an open watercourse or are within 50 m of an open watercourse.</p>	<ul style="list-style-type: none"> • Applies equally to natural watercourses, award drains, other open water channels and open municipal drains approved under the Drainage Act. • The criterion also applies to permanent flowing and intermittent watercourses, but not ephemeral swales which only convey water for very brief periods at the height of runoff. • To meet this criterion, the drainage feature should have a defined channel, a watercourse dynamic and an associated ecological benefit.
<p>8. Significant wildlife habitat (SWH)</p> <ul style="list-style-type: none"> • Woodland amphibian breeding habitat • Migratory bird habitat (this would include a large area of the lakeshore and riparian corridors inland; see Section xx3.4); • Colonial nesting habitat areas (e.g., bank swallow colonies, heron colonies) • Dune/grassland recovery plan areas • Important Bird Areas; • Deer wintering yards 	<p>NOTE: These do not represent all potential SWH in the Municipality of Kincardine, but rather all categories of SWH confirmed for the Municipality of Kincardine based on the available information. However other types of SWH may very well be present in the Municipality and need to be assessed during site-specific studies.</p>

Recommended Criteria	Measures / Application
<p>9. Patches with the largest amount of area on each landform and on each surficial geological classification in the County as well as all patches that occur on valley lands identified through Conservation Authority slope stability and erosion lines</p>	<ul style="list-style-type: none"> • Valley lands used were those mapped as hazard lands by the Conservation Authority • Recognizes Lake Nipissing and Lake Warren shorelines
<p>10. Patches that contain the largest amount of the natural vegetation communities as determined by distribution curves of area and vegetation community type.</p>	<p>The vegetation community sizes identified for the County of Oxford NHS are provided in the Volume 1 report.</p> <p>These still need to be refined for the Municipality of Kincardine when sufficient information (i.e., ELC for the entire Municipality) is available.</p>
<p>Linkages (to be applied after application of criteria 1 through 10)</p>	
<p>11a. RIPARIAN LINKAGES: Riparian corridors</p>	<ul style="list-style-type: none"> • Corresponds to SVCA mapped Hazard Lands • Should be a minimum of 100 m wide and in some cases wider linkages may be identified to provide interior habitat for regional ecological corridors.
<p>11b. TERRESTRIAL LINKAGES: Natural linkages that connect otherwise isolated NHS habitat patches across the landscape</p>	<ul style="list-style-type: none"> • Recommended terrestrial linkages have been mapped as part of the preliminary NHS. • Within rural areas dominated by agricultural land uses the recommended linkages do not require further refinement.. • When development proposals or municipal infrastructure is proposed additional studies should be conducted to identify linkage areas required to provide long-term functional ecological connectivity. • Linkages between isolated habitat patches within the NHS should be a minimum of 100 m wide and may be up to 300 m wide where required to provide interior habitat and/or as part of regional ecological corridors • Linkages may include natural and semi-natural habitat as well as areas such as plantations, hedgerows and agricultural fields that may be restored to provide an enhanced linkage function. • Where possible linkages should include small woodlands within 100 m of NHS habitat patches connected by intervening open space. • Hedgerows should be used where present to build on existing linkage functions and these may be widened by including adjacent open space. • Mapping of linkages should be informed by the Ontario Nature Greenway mapping.

2.3 NHS Criteria Application

The NHS criteria for the Municipality of Kincardine were applied independently to each patch (both within and outside the lakeshore area) so that any patch meeting at least one criterion was considered significant. This was considered to be a conservative approach to identifying features and areas for inclusion within the NHS. It is recognized that more detailed or site-specific field studies may determine that some of the patches identified do not meet the requisite criterion, and that alternately additional patches may be identified that do meet criteria for inclusion in the NHS. For a large scale study such as this, it was considered preferable to take a conservative approach rather than a more complex scoring or weighting systems as it was felt simple one criterion approach provided a more objective analysis of the available data.

3.0 RECOMMENDATIONS FOR NATURAL HERITAGE POLICY

This section provides some direction and recommendations for policies that would support implementation of the Natural Heritage System, as described in Volume 1, in the Municipality of Kincardine. The final policies should, however, be developed with additional input from Municipality and County planning staff as well as with consideration for input from local agencies, other stakeholders / stakeholder groups and the broader community.

3.1 General Policy Considerations

The approach adopted for identification of a preliminary NHS, as described and shown in the Volume 1 report, has resulted in identification of an NHS that is somewhat generalized and will need to be subject to refinement as more detailed information becomes available and/or more studies are undertaken in the Municipality. Nonetheless, the recommended criteria (as listed in Section 2.2 above) and related mapping (provided in Volume 1) provide a good basis for ecologically sound natural heritage planning. The key will be in ensuring that the criteria and resultant NHS are carried over into policy so that they are strong enough to ensure a truly sustainable NHS is maintained in the Municipality of Kincardine, while still providing adequate flexibility to accommodate some development in appropriate locations and also be refined in response to new and/or site-specific information.

It has become clear through the Natural Heritage Study process that the Municipality of Kincardine's lakeshore area (i.e., the lakeshore stretching from south of the Geographic Town of Kincardine to MacGregor Point ESA) is biologically rich and diverse and that the significant ecological features and functions present warrant special treatment as a coastal corridor subject to fairly restrictive land use policies. This approach is not unique, and a good nearby and current example is the County of Norfolk which recently conducted extensive studies to help define and develop policies for its "Lakeshore Special Policy Area" (Marshall Macklin Monaghan 2007).

Examples of goals and policies that would be supportive of maintaining the area's existing significant natural heritage, as suggested by the study Science Committee, include:

- require tree preservation as part of any development along with 2:1 replacement ratios for trees removed (tree replacement may be off-site if necessary);
- identify small parcel development areas that concentrate development and large parcel development areas that restrict development to lower densities outside of the largest and most sensitive habitat patches in the NHS;
- implement communal septic systems and/or other shared services and/or individual tertiary septic treatment systems to reduce the overall footprint of the development;
- require preservation of the integrity and where necessary the restoration of dune systems and coastal wetlands;
- maintain core areas (habitat patches) of sufficient size to provide long term viable habitat for those species intended to be protected by the NHS; and
- maintain and/or restore functional ecological linkages among habitat patches.

These considerations have been incorporated into the preliminary policy recommendations provided in this section.

3.2 Recommended Policy Goals and Objectives

The policies that accompany the Natural Heritage System (NHS) should begin with clear goals and objectives for the system. The following provides examples of goals and objectives that would be appropriate for implementing the Kincardine NHS.

The NHS captures the full range of significant ecological features and functions in the Municipality of Kincardine. Protection of the NHS will continue to support these ecological features and functions, thereby contributing to supporting the biodiversity in the Municipality, in the County, and beyond.

The natural heritage goals for the Municipality of Kincardine should encompass the following concepts and principles:

- a) to protect the significant natural heritage features of the area within a well-connected NHS;
- b) to protect the significant natural heritage features within a linked system designed to support:
 - retention of current biodiversity;
 - linkages to facilitate migration and movement of flora and fauna within the Municipality of Kincardine, and beyond;
 - protection of current water quality and aquatic resources;
 - continuation of the ecological functions provided by natural features identified as significant; and
 - opportunities for natural regeneration and habitat restoration;
- c) to maximize the conservation of native plant and animal species throughout the Municipality of Kincardine, including areas outside of the NHS;
- d) to allow natural processes of disturbance to occur (e.g., wetland creation by beaver dams) as long as they do not threaten property or human safety;
- e) to ensure minimal disturbance to existing fish habitat and look for opportunities to enhance fish habitat throughout the Municipality of Kincardine; and
- f) to protect surface water quality through achievement of Provincial Water Quality Objectives (PWQOs) and protect groundwater resources.

3.3 Recommended General NHS Policies

The following general natural heritage policies are recommended for helping to ensure that new development has minimal negative impacts on the NHS and that losses of habitat and/or associated ecological functions are restored on-site or elsewhere in the NHS.

- a) Growth should be directed outside of the NHS and towards existing designated urban areas.
- b) Significant natural heritage features in the Municipality of Kincardine should be protected within a NHS (as illustrated in Schedule ___).
- c) The NHS along the lakeshore should be considered a significant Lakeshore Coastal Corridor (as illustrated in Schedule ___).
- d) The mapping of the NHS (as illustrated in Schedule ___) should be considered conceptual and preliminary in nature, and subject to periodic review and refinement based on the incorporation of new natural heritage data / mapping as well as findings from more site-specific studies (e.g., Environmental Assessments (EAs), Environmental Impact Statements (EIS)).
- e) Buffering the NHS from surrounding development should be considered an integral part of protecting the NHS.
- f) Designation of lands within the NHS does not imply intent of the Municipality or other public agencies to purchase such lands, nor does it imply their use as publicly accessible open space.
- g) Lands identified within the NHS will not be accepted as part of the park dedication required by the *Planning Act* but conveyance of these areas to a public authority will be encouraged as part of the development process.
- h) Removal, damage or modification of natural features within the NHS, through natural or other causes, will not result in their deletion from the NHS without the review and consent of the Municipality and all policies will continue to apply as though the feature had not been altered.
- i) Nothing within the NHS policies is intended to impede normal farming practices. Lands within the NHS that are part of an active farming property should be managed in accordance with stewardship principals that are consistent with the features and functions of the NHS.
 - Allowable activities would include management of woodlots according to an approved management plan, selective cutting in woodlands to maintain forest species diversity and/or provide fuel for personal use, and implementation of buffer zones to enhance water quality.
 - Activities that would not be supported include drainage of wetlands, clear cutting of woodlands, or expansion of farming practices into existing riparian zones (i.e., hazard lands along streams and creeks).
 - The development of new farm infrastructure such as buildings, roads, *etc.* should be reviewed in the context of protecting the NHS from more intensive development.

3.4 Recommended Specific NHS Policies

The following NHS-specific policies are recommended to assist in the implementation of the NHS in a manner that is consistent with the science-based criteria laid out in the Volume 1 report used for NHS identification and preliminary mapping.

- a) As part of the development application process, the boundaries of the Natural Heritage System may be refined (from those shown in Schedule __) through an EIS (as outlined in Section 4).
- b) As part of the development application process, a buffer shall be determined between the NHS and the development that is appropriate for the protection of the ecological features and functions present within the NHS.
- c) The boundaries of the NHS components shall be defined by the greater of the following:
 - i) The boundaries of habitat patches containing rare species;
 - ii) The boundaries of habitat patches containing ANSIs, hazard lands, ESAs, PSWs or LSWs;
 - iii) The boundaries of habitat patches 150 m from designated natural areas (i.e., ANSIs and hazard lands) not containing wetlands;
 - iv) The boundaries of all habitat patches 750 m from designated natural areas containing wetlands (i.e., PSWs or LSWs);
 - v) The boundaries of habitat patches greater than 7.6 ha;
 - vi) The boundaries of habitat patches with more than 0.5 ha of forest-interior;
 - vii) The boundaries of habitat patches within identified well-head capture zones or intrinsic groundwater susceptibility areas;
 - viii) The boundaries of habitat patches within 50 m of the edge of an open water course;
 - ix) The boundaries of habitat patches containing documented significant wildlife habitat;
 - x) The boundaries of habitat patches with the largest amount of area on each landform and on each surficial geological classification in the County as well as all patches that occur on valley lands identified through Conservation Authority slope stability and erosion lines;⁷
 - xi) The boundaries of habitat patches that contain the largest amount of the natural vegetation communities as determined by distribution curves of area and vegetation community type⁸.
- d) In addition to the NHS habitat patches identified according to the criteria above, linkages between otherwise isolated habitat patches are an integral part of the NHS.
 - i) Riparian Linkages (corresponding to riparian corridors and other hazard lands identified by the SVCA) should generally be protected from development. Where road crossings are required, the provision of mitigative measures (such as wildlife

⁷ The analysis to provide this information has not yet been conducted and remains a data gap that needs to be filled.

⁸ The analysis to provide this information has not yet been conducted and remains a data gap that needs to be filled

- underpasses/overpasses) should be considered in the context of meeting the short and long term requirements of local and regional wildlife movement.
- ii) Terrestrial Linkages have been mapped conceptually in the Municipality of Kincardine. Because most of the Municipality is agricultural, current land use allows for movement of many types of wildlife between habitat patches. However, if a land use change (including infrastructure development such as roads, utility corridors, *etc.*) is proposed within the Lakeshore Coastal Corridor or within the rural part of the Municipality, the final boundary of linkages should be identified between NHS habitat patches. Terrestrial linkages between isolated habitat patches within the NHS:
- should be a minimum of 100 m wide and may be up to 300 m wide depending on the ecological linkage function determined to be appropriate;
 - can include any types of natural and semi-natural habitat as well as plantations, hedgerows and agricultural fields;
 - may include small woodlands within 100 m of NHS habitat patches that, if possible, could be connected using intervening open space;
 - should incorporate hedgerows if they are sufficiently wide and provide adequate connectivity between otherwise isolated patches, or can be widened by adjacent open space.
- iii) The intent of linkages (riparian and terrestrial) is not to impede farming practices, since wildlife are generally able to move across agricultural fields. However, naturalization of linkages should be encouraged and supported wherever feasible, and particularly in cases where they are associated more intensive land uses such as residential, commercial or industrial development.
- e) Management required to maintain human safety, or to restore or enhance natural structure and function, will be permitted in the NHS.
- f) New crossings of the NHS by roads and essential infrastructure (servicing, sanitary sewers, *etc.*) are generally discouraged and shall be permitted subject to the following:
- i) an EIS intended to identify all impacts related to the proposed infrastructure and appropriate protection, mitigation and enhancement measures to offset those impacts;
 - ii) an EIS will identify mechanisms for minimizing impacts to ecological features within the NHS and to short and long term functions of the NHS such as wildlife movement and hydrologic functions before identifying mitigation measures. Examples of mitigation, to facilitate wildlife movement and be generally supportive of the NHS, may include:
 - the use of oversize box culverts or span bridges;
 - underpasses constructed in association with a permanent or intermittent watercourses should that include sufficient terrestrial habitat along the watercourse;
 - terrestrial underpasses located in confirmed wildlife corridors;
 - modified road design standards to minimize the short and longer term impacts of required infrastructure (e.g., reduced road width, sidewalk on

- one side only, utilities located beneath the road, special road lighting, reduced traffic speeds, warning road signs, etc.);
 - consideration of topography and drainage in sighting the crossing; and
 - design of crossing to prevent road de-icing salts (and other chemicals) from entering watercourses and wetlands.
- iii) consultation with the Municipality, County and Saugeen Valley Conservation Authority.
- g) Low impact development (LID) approaches to storm water management should be implemented to the greatest extent possible within developments to reduce the size or eliminate the need for traditional stormwater management ponds.
- h) Stormwater management (SWM) facilities should be constructed outside the NHS. In some cases, SWM facilities may however be constructed within the buffers to the NHS, subject to the completion of an EIS.

3.5 Options for NHS-Specific Policy Implementation

The natural integrity and function of the NHS throughout the Municipality should be maintained through protection of significant patches and linkages, as defined by application of the recommended criteria. However, patches and/or linkages determined to meet one (or more) of the established criteria may be subject to boundary refinements and review based on site-specific studies, and some portions of patches may potentially be developed as presented in Options 1, 2 and 3 laid out in Table 2 below.

Although the approach taken for identifying the Kincardine NHS in this study (i.e., using habitat patches as the base unit for inclusion or exclusion of natural heritage features and related functions) captures a wide range of features and functions that have significance at different jurisdictional levels, it is still recommended that for site-specific studies patches be broken down into the various features that comprise them, and also be evaluated in terms of the criteria being met by (a) the individual features in that patch and (b) the patch as a whole. In this way, some areas within a given patch that may have less significance than others can be distinguished using a matrix that assesses which portions of the patch meet which criteria. However, it is critical that during this process the bigger picture context is also considered so that key linkages (riparian and terrestrial) are identified and protected to allow for movement of local flora and fauna.

In addition, given that much of the Municipality's lakeshore meets at least one of the recommended criteria (see Table 1 above), and that this is also where there is the most development pressure, it is recommended that this area be designated as a Lakeshore Coastal Corridor and that unique policies apply to this area that recognize the ecological uniqueness and sensitivity of this area but still allow for some limited types of development in certain types of features, as long as the criteria for which an area was originally designated are not compromised (e.g., proposed development does not result in a patch captured because of its size being reduced to less than 7.6 ha, or a forest patch with forest interior habitat losing that interior).

Policies and practices for the lakeshore to consider in conjunction with the options presented below include:

- Intensive development (e.g., residential subdivisions, townhouse blocks) should be directed towards existing urban centres and settlement areas.
- On sites where development is permitted within portions of the NHS on the lakeshore, natural vegetation cover of at least 40% should be retained (notably, this includes grasslands and successional habitats as well as woodlands and wetlands).
- All permitted development outside existing urban centres and settlement areas within the lakeshore area should be limited to low density development that maximize tree preservation, limit grading, minimize building footprint, protect local water resources, and limit any associated impermeable infrastructure (e.g., driveways).
- New development should be restricted to areas >200 m from the lakeshore.
- Sections of waterfront along the lakeshore should be identified for public use and access, but should also be developed in an ecologically sensitive way that maximizes retention and protection of local vegetation and wildlife habitat (see strategies adopted for Inverhuron Provincial Park).
- For lots with existing cottages, (including areas delineated as forest – residential on Figures 4a to 4d in Volume 1) minor changes should be permitted as long as 40% natural vegetation cover is retained.

Table 2 presents three policy options for each natural heritage feature or function to be addressed which can be generally described as follows:

- Option 1: most conservative (i.e., most conservation oriented)
- Option 2: moderately flexible
- Option 3: most flexible

Option 1 goes beyond what might be considered the basic requirements of the Provincial Policy Statement, but is intended to provide the best basis (all else being equal) for the long term protection of native biodiversity within the Municipality of Kincardine.

Option 2 is also consistent with the Provincial Policy statement but provides greater flexibility in the implementation of the NHS while also providing assurance of the protection of the significant features and functions that make up the NHS.

Option 3 is consistent with the basic requirements of the Provincial Policy Statement, but is the riskiest in so far as it will likely not provide a sound basis for ensuring the long-term protection of the full range of significant ecological features and functions currently documented in the Municipality of Kincardine (as described in the Volume 1 report for this study).

Notably, all options assume that EIS are being completed and implemented according to rigorous and comprehensive guidelines, such as those provided in this report.

Furthermore, the Municipality may not elect to adopt all the recommendations from a single option, but may choose to select elements from all the options presented to best reflect local priorities and needs.

Table 2. Summary of natural heritage feature and function-specific policy options within the Municipality of Kincardine Natural Heritage System (NHS).

Specific features within the NHS	Option 1	Option 2	Option 3
TERRESTRIAL AREAS WITH HYDROLOGIC SIGNIFICANCE			
1. Provincially Significant Wetlands (PSWs)	No development in PSWs or a minimum buffer zone around them (e.g., 30 m to 120 m)	No development	No development
2. Locally Significant Wetlands (LSWs)	No development in LSWs or a minimum buffer zone around them (e.g., 30 m to 50 m)	No development	Potential development subject to EIS
3. Unevaluated and other wetlands	No development (subject to boundary verification)	No development unless wetlands demonstrated to have no ecological function	Potential development subject to EIS
4. Source water protection areas (SWPA) (i.e., wellhead protection zones and high groundwater sensitivity areas)	No development	No development of high groundwater sensitivity areas, but potential development of well-head protection areas subject to EIS	Potential development subject to EIS
5. Vegetation communities on or within 50 m of a watercourse	No development	No development of vegetation on a watercourse, but potential development of vegetation within 50 m of a watercourse subject to EIS	Potential development subject to EIS
6. Vegetation communities that occur on valley lands identified through Conservation Authority slope stability and erosion lines [‡] .	No development	No development	Potential development subject to EIS
LIFE AND EARTH SCIENCE AREAS OF NATURAL & SCIENTIFIC INTEREST (ANSIs), ESAs & HAZARD LANDS			
7. Provincially Significant Earth or Life Science ANSIs	No development in ANSIs or a minimum buffer zone around them (e.g., 10 m to 50 m)	No development	Potential development subject to EIS

Specific features within the NHS	Option 1	Option 2	Option 3
8. Regionally Significant Earth or Life Science ANSIs	No development	Potential development subject to EIS that ensures reasons for ANSI designation are not compromised	Potential development subject to EIS
9. ESAs*	No development (subject to boundary verification)	No development in portions that overlap with other designated features; potential development in remaining portions subject to EIS	Potential development subject to EIS
10. Hazard Lands	No development (subject to boundary verification)	No development (subject to boundary verification)	Potential development subject to EIS
HABITAT FOR RARE or SIGNIFICANT SPECIES			
11. Habitat for Provincially THR and END Species** (as designated by COSSARO)	No development of significant habitat or associated vegetation protection zone (where identified)	No development of significant habitat; potential development of portions identified vegetation protection zone subject to EIS	No development of significant habitat; potential development of portions identified vegetation protection zone subject to EIS
12. Habitat for federally and provincially rare species not captured by #4 above (i.e., COSEWIC THR, END or SC; COSSARO SC; NHIC ranked S1, S2, S3, S3S4).	No development of significant habitat or associated vegetation protection zone (where identified)	No development of significant habitat; potential development of portions identified vegetation protection zone subject to EIS	Potential development subject to EIS
13. Habitat for regionally and locally rare species (as per the Bruce County Flora and OBBA)	No development	Potential development of portions of the habitat subject to EIS if abundant habitat for the species in question occurs elsewhere in the Municipality	Potential development subject to EIS

Specific features within the NHS	Option 1	Option 2	Option 3
RARE or SIGNIFICANT HABITATS, including SIGNIFICANT WILDLIFE HABITAT			
14. Provincially Significant Plant Communities (NHIC ranked S1, S2, S3) (vegetated dunes, beaches, bluffs with native species, sand barrens)	No development	No development	Potential development subject to EIS
15. Regionally significant plant communities (identified by Henson & Brodribb 2005)	No development	Potential development of community types of “secondary” importance (as per Henson & Brodribb 2005) subject to EIS	Potential development subject to EIS
16. Significant Woodlands (i.e., all woodlands within the NHS patches)	No development of woodlands or a minimum buffer zone around them (e.g., 10 to 50 m)	No development of woodlands with forest interior. Development of other woodlands subject to EIS require retention of 30-40% tree cover	Potential development subject to EIS
17. Other Significant Wildlife Habitats (e.g., colonial bird nesting areas, woodland/pond amphibian breeding habitat, etc.) ***	No development of SWH	Potential development of portions of the habitat subject to EIS if sufficient occurs elsewhere in the Municipality or functions are maintained	Potential development subject to EIS
REPRESENTATIVE HABITATS			
18. Patches with the largest amount of area on each landform and on each surficial geological classification in the County [‡] .	No development	Potential development of portions of the habitat subject to EIS if sufficient occurs elsewhere in the Municipality	Potential development subject to EIS
19. Patches that contain the largest amount of the natural vegetation communities as determined by distribution curves of area and vegetation community type [‡] .	No development	Potential development of portions of the habitat subject to EIS if sufficient occurs elsewhere in the Municipality	Potential development subject to EIS

Specific features within the NHS	Option 1	Option 2	Option 3
LINKAGES			
20. Riparian Linkages (i.e., hazard lands, width variable 100 to 300 m)	No development. Allowance for continuation of existing farming practices and support for naturalization, where appropriate	Severance of linkage with roads or other infrastructure strongly discouraged; some limited types of compatible development permitted	Potential development subject to an EIS that demonstrates NHS linkage functions are maintained
21. Terrestrial Linkages (width variable 100 to 300 m, may include small isolated woodlots, successional habitats, hedgerows, plantations and agricultural lands)	No development. Allowance for continuation of existing farming practices and support for naturalization, where appropriate	Potential development subject to an EIS that demonstrates the linkage functions are maintained and development must leave a minimum 40% natural vegetation cover and ensure a contiguous connection	Potential development subject to an EIS that demonstrates NHS linkage functions are maintained
22. Other linkages (to be identified on a site-specific scale)	To be identified where opportunities exist	To be identified where opportunities exist	To be identified where opportunities exist

- * Note that ESAs were identified in the 1980's by the Saugeen Valley Naturalist Club and were digitized as part of this study but have never been formally reviewed or designated by either Bruce County or the Municipality of Kincardine.
- ** Extent of critical habitat for protected species needs to be determined in consultation with local agencies.
- *** In addition to the specific SWH categories confirmed through this study, site-specific studies should be required to assess the presence of absence of all types of SWH.
- ‡ Analyses to determine what these representative vegetation communities or landforms have yet to be conducted.

Based on the experience of the study team in other municipalities in southern Ontario, the policies outlined in Option 2 are considered adequate for the protection of the NHS while the policies of Option 1 provide a more precautionary approach to protection of the NHS. As such Option 1 policies may be important to mitigate unforeseen impacts such as those associated with global climate change, introduced exotic pests, and future land use changes.

3.6 Recommended NHS Protection and Stewardship Policies

NHS are required in landscapes where habitat is fragmented to ensure that ecological features and functions are sustained and remain connected. However, identification and protection of the NHS from development and related impacts in a fragmented landscape should also be supported by ongoing management activities, some passive and some active, to help ensure long-term sustainability. The following protection and stewardship policies are recommended to help achieve this objective should land use in the area surrounding the NHS change.

- a) In general, features within the NHS will not be altered or modified except for:
 - i) Management as part of a Management Plan approved by the Municipality, County or SVCA designed to enhance the natural values of features by improving biological diversity, providing or improving habitat for valued species of flora and/or fauna, etc. Such plans may include naturalization of watercourses, maintenance of open habitat for breeding birds, control of non-native plant species, and control of invasive native species.
 - ii) Management of plantation areas in order to restore them to native woodland communities, where appropriate.
- b) The boundaries of the NHS should be fenced where they abut private property and access to the NHS should only be through public lands with trail design based on an EIS.
- c) In general, the areas within the NHS shall be left in a natural condition. However, management in these areas, consistent with the intent of protecting features is permitted as follows:
 - i) Trees, including the limbs of trees, may be removed if they pose a threat to adjacent private property.
 - ii) Farming practices consistent with those that have occurred in the past (e.g. ecologically sustainable forestry practices);
 - iii) Enhancement plantings (e.g., along watercourses for fish habitat improvement) or other habitat improvement may be undertaken subject to approval by the Municipality, and/or in consultation with the SVCA.
 - iv) Areas of open habitat such as meadows and grasslands may be managed to retain their open character, in order to provide this type of habitat for wildlife.
 - v) Creation or maintenance of trails that are designed in an ecologically sensitive manner and intended to direct traffic around or away from ecologically sensitive features.
- d) Appropriate erosion control measures should be undertaken during construction to minimize the run-off of sediments and the potential for local slumping, especially adjacent to areas of steep slopes (as shown on Schedule ___).

- e) Activities and proposed works in and around fisheries resources within the NHS should consider:
 - i) All works in and around water are subject to the Federal Fisheries Act and shall be designed in accordance with the policy of “no net loss” of the productive capacity of fish habitat.
 - ii) Under a Level 2 agreement, SVCA will act as an agent for Fisheries and Oceans Canada and shall review all proposed works.
 - iii) Works which will result in a harmful alteration, disruption or destruction (HADD) of fish habitat will require a Fisheries Act Authorization (under which relocation or enclosure of watercourses is generally discouraged).
 - iv) Activities should not negatively impact water quantity or quality (including thermal impacts) of fisheries resources.
 - v) Proposed activities should consider all possible mitigation measures to minimize impacts to fish habitat.
 - vi) Opportunities to restore and enhance fisheries resources, including associated riparian zones, should be encouraged.

- e) Monitoring should be required for NHS habitat patches adjacent to new developments, at the proponent’s expense, that:
 - i) Ensures that all requirements regarding protection and mitigation identified through the EIS and/or Environmental Implementation Report (EIR) are undertaken and implemented as specified; and
 - ii) Ensures that the ecological features and functions for which the patch has been designated remain intact during and following development. This can be scoped to the primary areas of concern, but should be undertaken for a period of at least three but preferably five years.

- f) For proposed development within the Lakeshore Coastal Corridor, a stewardship brochure should be prepared at the expense of applicants and provided to all new property owners at the time of purchase. The brochure should:
 - i) briefly describe, in non-technical language and with photographs and/or graphics, the specific environmental features and sensitivities in the immediate area as well as in the context of the significance of the larger Lakeshore Coastal Corridor and the Municipality’s NHS;
 - ii) explain, that as residents of this area, there is a collective responsibility for maintaining local environmental quality;
 - iii) provide a brief summary of the main, typical negative impacts associated with development;
 - iv) provide suggestions for stewardship that will contribute to the protection of environmental features of the NHS, such as trail etiquette, pet control, benefits of native landscaping, etc., and
 - v) identify the Municipality, SVCA or other relevant agency as a contact(s) and resources (e.g., local naturalists clubs) for further information.

3.7 Other Recommendations Related to the NHS

As stated above, ongoing protection of a NHS from development and related impacts in a fragmented landscape should also be supported by various management and stewardship activities to help ensure long-term sustainability. The following are a few examples of activities that can be pursued and/or supported in conjunction with the implementation of policy initiatives.

Monitoring

It is recommended that an overall monitoring plan be developed for the NHS with the objective of tracking the status of the NHS as development proceeds in the Municipality. This will allow the Municipality to measure how effective its NHS policies have been, and help identify areas where corrective actions need to be implemented.

This plan need not be overly onerous or complex, but key requirements of this plan should include:

- Clear identification of goals and targets (e.g., maintenance of 20% natural cover, including forest cover, in the Municipality through the NHS).
- The identification of a public agency⁹ to coordinate, store and manage the monitoring data, develop (or review) management prescriptions where required, and undertake (or authorize someone else to undertake) responses to undesirable trends;
- Establishment of baseline data / mapping (quantified and based on field studies, and reliable existing data) to measure the future condition of the NHS;
- An approach to monitoring biological diversity of the NHS that is straightforward, reliant on data that is readily available or easy to collect (e.g., significant species records¹⁰, or presence/absence of indicator species¹¹);
- Dedicated funding and staff allocation for implementation.

Stewardship Initiatives

Initiatives that help foster voluntary stewardship of rural landowners in support of local natural heritage should be studied in more detail by the Municipality (and County), and supported to the greatest extent possible. Two examples raised through the course of this study are:

1. the Grey-Bruce Greenway Initiative (already underway), and
2. the Alternative Land Use Services (ALUS) initiative (which has stirred up tremendous interest in Norfolk County and other jurisdictions within and outside of Ontario).

Land Acquisition Strategy

Although designation of NHS lands does not imply purchase of these lands by the Municipality or County, it would be useful to develop some policies regarding land acquisition and identify priorities for acquisition/protection within the NHS. This can be achieved through a variety of non-regulatory means, including: exchange, lease, conservation agreements, easements, dedications, bonusing, density transfers and land trusts.

e.g., species that are rare, threatened, endangered, or “of concern”

¹¹ e.g., area-sensitive or habitat-specific species

4.0 DRAFT ENVIRONMENTAL IMPACT STUDY (EIS) GUIDELINES

The following guidelines are intended to supplement municipal natural heritage policy implementation and to provide more specific guidance regarding the requirements for a site-specific EIS in the context of the recommended Natural Heritage System (NHS). These guidelines have been developed based on a review of selected current and comprehensive municipal EIS guidelines (e.g., County of Norfolk, Toronto Region Conservation Authority, Credit Valley Conservation, City of London, City of Hamilton), an understanding of the Kincardine's local natural heritage, and the expertise of the study consulting team.

The intent of these guidelines is to provide direction that is as comprehensive and specific as possible. It is understood that each EIS will, however, need to be scoped depending on the nature of the proposed development and its location in relation to the NHS. These guidelines are also draft and should be refined with specific input from local agencies, the Municipality of Kincardine's Environmental Advisory Committee (EAC), other consultants with expertise in EIS, and those municipal planners who will be responsible for enforcing these guidelines.

4.1 Existing EIS Policy

Both the County of Bruce and the Municipality of Kincardine currently provide policy in their Official Plans that outlines requirements for Environmental Impact Studies (EIS) that are generally appropriate and sound. Section 4.3.9 of the County of Bruce Official Plan requires an EIS for: "*any proposal on or adjacent to a wetland, the habitat of endangered or threatened species, fish habitat, significant woodlands, significant valley lands, significant wildlife habitat, ANSIs, or headwater and recharge areas whether they appear on Schedules to this Plan or as identified by the proponent and/or review agencies.*" As part of this process, the proponent advised to consult with the First Nations and consult early in the application process with the County and other appropriate agencies (i.e., OMNR, SVCA and NEC where appropriate) regarding specific EIS requirements.

The County of Bruce Official Plan further specifies that the EIS should be completed by a qualified professional and consist of:

- a) *a description of the purpose of the undertaking, the duration of impacts to the site, as well as the possible effects of the proposed undertaking;*
- b) *a description and statement of the rationale for:*
 - i) *the undertaking;*
 - ii) *the alternative methods of carrying out the undertaking; and,*
 - iii) *the alternatives to the undertaking.*
- c) *a description of:*
 - i) *the environment that will be affected or that might reasonably be expected to be affected, directly or indirectly;*
 - ii) *the effects that will be caused or that might reasonably be expected to be caused to the environment; and*
 - iii) *the actions that are necessary or that may reasonably be expected to be necessary to prevent, change, mitigate or remedy the effects or the effects that might reasonably be expected upon the environment by the undertaking.*
- d) *an evaluation of the undertaking's advantages and disadvantages.*

The Municipality of Kincardine Official Plan also has a comparable set of general policies regarding requirements for an EIS (Section D7.6) that specify that the EIS should be completed by a qualified professional and consist of:

- a) *description of the purpose of the undertaking, the duration of impacts to the site, as well as the possible effects of the proposed undertaking;*
- b) *a description and statement of the rationale for the undertaking, the alternative methods of carrying out the undertaking and, the alternatives to the undertaking.*
- c) *a description of:*
 - i) *the environment that will be affected or that might reasonably be expected to be affected, directly or indirectly, including fish and wildlife habitat and significant woodlands;*
 - ii) *the effects that will be caused or that might reasonably be expected to be caused to the environment; and,*
 - iii) *the actions that are necessary or that may reasonably be expected to be necessary to prevent, change, mitigate or remedy the effects or the effects that might reasonably be expected upon the environment by the undertaking.*
- d) *an evaluation of the undertaking's advantages and disadvantages.*

The Municipality of Kincardine's Official Plan EIS policies further state that "*On lands that are designated as a "Significant Woodland" ... the proponent may also be required to prepare a Comprehensive Environmental Evaluation Report (CEER) ... or incorporate the requirements of an EIS into the CEER*" as laid out in Section C2.3.2 of the Official Plan (note: the clause is currently before the OMB). The CEER is to include, in addition to the EIS requirements above:

- *A detailed inventory of the woodland, and mapping of the extent of the woodland;*
- *The impact on the woodland of existing and proposed drainage (surface and subsurface) required for the proposed development;*
- *An analysis of the role of the woodland in the area, and particularly whether the woodland is part of a larger wildlife or natural features corridor or link;*
- *Identification of any rare or endangered species habitat in or in the vicinity of the woodland, and the identification of species habitat of conservation concern;*
- *Identification of methods to ensure the long term health and viability of the woodland.*

Notably, both the County and Municipality include the policy option to waive the requirement for an EIS if the proposal is of such a minor nature or site conditions are such that the preparation of an EIS would serve no useful purpose for the protection of the significant environmental features.

4.2 Scoping an EIS

Given the number of data gaps with respect to natural heritage in both the Municipality and County, and the broad nature of the preliminary NHS, there will be a fair bit of onus on the EIS to provide a comprehensive assessment and consider the full range of potential natural heritage issues at both the site-specific scale and in the broader landscape context. However, the Municipality, in association with the local Conservation Authority should bear the responsibility of scoping the EIS requirements and approving a site-specific Terms of Reference based on available information.

In cases where there are data gaps and the proposed development is significant (e.g., not a simple lot severance), the Terms of Reference should err on the side of caution and require studies to verify the presence of significant natural heritage features and/or functions both within the subject lands and also in the broader landscape context.

The parties developing the Terms of Reference should have some familiarity with the available data and also understand the special timing requirements for certain types of ecological assessments, as specified below. In addition to consideration for all on-site issues, there should also be consideration for local and larger scale natural heritage linkages in the landscape, as identified on a preliminary basis through this study.

4.3 Recommended Approach

Under the Provincial Policy Statement and both the County of Bruce and Municipality of Kincardine's Official Plans, development or site alteration adjacent to (and in some cases within) natural hazard lands and significant natural heritage areas can only occur if an Environmental Impact Study (EIS) proves to the satisfaction of the municipalities and the reviewing agencies that the proposed development will have no negative impacts on the environmental features and associated functions of the subject lands.

Although rarely discussed, it should be acknowledged that any type of site alteration or development is likely to have some impact on the significant natural heritage features. However, what the EIS should be evaluating, with the best available information and to the best of the consultant's professional opinion, is: (a) whether or not these impacts are likely to compromise the short and long-term sustainability of the features and associated functions, and (b) if the site development / alteration provides opportunities for enhancing or improving the natural feature and / or functions.

Prior to the assessment of the proposed development and anticipated impacts, the EIS should also analyze the existing natural heritage features and functions of the site in order to define the local natural heritage that will be required to maintain ecosystem function given that changes to the landscape or site may result. This should incorporate linkages between natural features to ensure that life cycles can continue to be completed and that genetic exchanges can occur.

The EIS should also provide sufficient information to enable Kincardine's local Environmental Advisory Committee (EAC), the SVCA, planners and politicians to make informed decisions on whether the proposal meets the intent and policies of the municipal official plans and the PPS. The completion of an EIS is often but should not always be considered an acceptance of a development proposal, and in cases of uncertainty it is recommended that the municipal planners request a peer review of the EIS report at the proponent's expense.

Notably, an EIS is not normally required where new infrastructure subject to the *Planning Act* is authorized under the environmental assessment process (which has its own impacts assessment).

4.4 Components of an EIS Report

4.4.1 INTRODUCTION / PROPOSAL DESCRIPTION

An EIS should clearly state up front what type of site alteration or development is being proposed and provide accurate information concerning:

- the planning context including any existing designations, zoning, and permitted uses;
- the surrounding land uses and the natural features located on adjacent properties (based on background information and air photo interpretation);
- the proposed timing for construction/development (including phasing, if appropriate);
- the current land use, existing land use regulations and ownership (on and adjacent to the proposed location).

This section should also include a location map detailing both site specific and regional perspectives and including information such as main roads, lot lines, building envelopes, laneways, septic system(s) and well(s) or waterline locations.

4.4.2 EXISTING CONDITIONS / BIOPHYSICAL INVENTORY

This section should include all the information obtained from various background and secondary sources as well as assessments from remote sensing (i.e., orthorectified air photo interpretation) and site-specific field studies. The EIS should explain and justify the level of investigation undertaken, and also ensure required field studies are undertaken within the appropriate timing windows and that the specific conditions (i.e., dates, methods) for field studies are documented in the EIS.

Background data sources may include:

- current ortho-rectified air photos
- existing mapping from the conservation authority and/or OMNR
- the Ontario Breeding Bird Atlas (OBBA), Ontario Herpetofaunal Atlas, the Ontario Mammal Atlas
- information obtained from previous studies such as life science inventories, natural areas inventories, local watershed plans, etc.
- relevant reports prepared for/by other agencies
- local naturalists

Unless specified during the EIS pre-consultation, the biophysical inventory should identify, in text and mapping, the following:

- known natural heritage designations within and beyond the site (e.g. ANSIs, PSWs, LSWs, ESAs, habitat of significant wildlife)
- natural heritage features and functions present on the site and within the landscape;
- specific location of boundaries or edges of identified features or functions;
- existing interconnections or corridors with adjacent natural features;
- identification of hazard lands;

For each type of field assessment undertaken the report should include:

- (1) number, date, time, and weather conditions during surveys;
- (2) names of surveyors and qualifications;
- (3) a full list species present and estimates of on-site abundance;
- (4) the global, national, provincial, regional, and local priority ranks for each species (as appropriate); and
- (5) the location of each significant species associated with the appropriate vegetation community (or stream segment), and for SAR the location specified in UTM's.

It is critical that field studies, particularly for breeding birds and breeding amphibians, as well as fish surveys, be undertaken within the appropriate timing window, as specified below.

Discipline-specific investigations that may be required include:

GEOLOGY & SOILS: A description of the soils, landforms and surficial geology based on a review of available mapping and literature. Topographical information should be provided on constraints mapping. Any feature staking that has been done to date (e.g. staking the top and/or toe of the valley slope) should also be indicated as well as the calculated hazard land limits (e.g. floodplain analysis, geotechnical review of slope stability and watercourse erosion, meander belt width analysis, etc.).

HYDROLOGY: Identify any hydrological or hydrogeological resources and issues, including surface water features, recharge/discharge zones, groundwater quality and quantity, groundwater elevations and flow directions, connections between groundwater and surface water features. More in-depth information (i.e., boreholes, surface flow measurements) may be required, depending on the scope, scale and issues identified for the proposal.

A pre-development water balance should be completed for the site in order to assess the quantity and quality of existing water budget components on the site. If there are existing natural heritage features on the subject property, including wetlands, woodlands, and watercourses, then a more detailed feature-based water balance will be required to determine existing flow paths and contributions to these features.

TERRESTRIAL & AQUATIC RESOURCES: A biophysical inventory and analysis of both terrestrial and aquatic communities, physical functions and processes that occur on and beyond the site that will be affected, or that might reasonably be expected to be affected, either directly or indirectly.

Vegetation Communities Survey & Reporting: A survey of vegetation community types should be undertaken during the main growing season and ideally over three seasons (spring, summer and fall), but otherwise during the period late May to July. Surveys necessarily conducted outside this timing window are feasible but are likely to miss significant as well as other species. Community description outlines may be qualitative, but should follow the Ecological Land Classification for southern Ontario (Lee et al. 1998) to Vegetation Community Type, or contain an equivalent or greater level of structural and floristic detail. The report should present both a description of the communities and vegetation maps superimposed preferably on an air photo or

a base map of scale no greater than 1:10,000 that shows contours and watercourses and the location of natural heritage features.

Any known historical or current management activities (e.g., selective harvesting within a woodlot for firewood) within the natural areas on site should also be described.

Vascular Plants Survey & Reporting: A complete list of all vascular plants observed on the site should be assembled. Status of globally, nationally, provincially, regionally and locally rare vascular plant species (using the most current status lists) should be noted and associated with specific ELC communities. The extent of habitat for each species of conservation concern should be outlined and survey dates should be indicated. Local status lists should include Johnson (1990) and

Wildlife Surveys & Reporting: Habitat, den sites, nesting, breeding, migratory stopover, spawning, nursery, overwintering areas and other locations should be identified as appropriate. Other wildlife functions should be identified and assessed, and, where appropriate, mapped. Wildlife functions include, but are not limited to, waterfowl staging areas, fish spawning or nursery habitat, herpetofaunal breeding or hibernacula areas, wintering grounds, areas that provide temporary shelter or feeding areas for migratory wildlife, areas that provide critical life cycle habitat, and wildlife corridors.

Breeding bird surveys should be carried out between May and July following the Ontario Breeding Bird Atlas Protocol (OBBA 2001). A minimum of 2 visits to the site is recommended at least 15 days apart during the breeding season. All initial visits are to be completed by the end of the third week of June. In addition to the general requirements for reporting laid out above, reports with breeding bird surveys should include a full list of bird species present and on-site abundance and an annotated assessment of confirmed, probable or possible breeding birds (based on breeding codes) and the number of territories.

Herpetofaunal Surveys: Salamander surveys may require agency approval. A frog and toad survey should be carried out according to either the Marsh Monitoring Protocol or the North American Amphibian Protocol. Surveys for snakes and turtles may be incidental to other surveys (i.e., searches under debris and searches of basking sites early in the season). At least two but ideally three surveys should be conducted in spring at least 15 days apart in order to capture the full range of possible amphibians using the site. The first survey should generally occur between April 15 and April 30, the second between May 15 and May 30 and the third survey should occur between June 15 and June 30. In addition to the general requirements for reporting laid out above, reports with herpetofaunal surveys should include specific notes on the weather encountered during surveys.

Aquatic Communities & Habitats Survey & Reporting: A survey of aquatic communities and habitats should be completed at the most appropriate times for sampling various species over the course of a year. Aquatic surveys should follow the Ontario Stream Assessment Protocol. A scientific collector's permit must be obtained from OMNR for most surveys.

The following technical information may include: fisheries and habitat inventory, fish habitat assessment and stream analysis, fish community and habitat assessment requirements for ephemeral streams. Ideally, assessments should be conducted in May or early June to document if water is present at a time when fish may be using these streams for spawning purposes. Where pike may use a stream, assessments may also be required as soon as ice is out (usually early April). Assessments may also be undertaken at other times of the year as project limitations dictate but ideally are coupled with additional observations in other seasons.

Assessments should identify current functions of the channel as fish habitat and make a determination of the potential for HADD (as per Section 35(2) of the *Fisheries Act*) for the works under consideration.

In addition to the general requirements for reporting laid out above, reports with aquatic surveys should include the locations and abundance of any observed spawning redds and relevant species, the length of surveyed site and an indication of the catch per unit effort; and a description and analysis of the existing habitat and any restoration or enhancement opportunities.

Benthic Surveys should follow a defined protocol, preferably the Traveling Kick and Sweep Technique across defined transects as outlined in OSAP. However, the Ontario Benthic Biomonitoring Network protocols are also acceptable.

4.4.3 ASSESSMENT OF EXISTING CONDITIONS

This should include an analysis of the inter-relationship of the biophysical information and provide an overview of the existing ecosystem both within the subject site and as it relates to the larger local and regional ecosystem. For example, linkages between features, such as groundwater-vegetation communities or groundwater-surface water relationships should be described. The investigation of the existing features should extend beyond the subject site and include adjacent areas, although the level of effort is typically scoped to available background information and air photo interpretation for the adjacent areas, and should be confirmed as part of the study terms of reference.

For determination of significance, the study should include all designated areas in the study area as well as all natural heritage features identified through the municipal and (if available) County NHS (in mapping or through policy and related criteria and/or guidelines). Significant species should be assessed using the most current lists from COSEWIC and COSSARO, Natural Heritage Information Centre (NHIC) records, species of conservation concern lists, and any local / regional lists such as Johnson (1990), Oldham (1990) and Bruce-Grey Plant Committee (2003).

4.4.4 IMPACT ASSESSMENT

The impact assessment should identify specifically, in writing and with maps as appropriate:

- the extent of the proposed vegetation removal, and the size and types of vegetation communities being removed (i.e., direct impacts);
- activities associated with the proposal that are expected to have environmental impacts (e.g., work on stream banks, tree-cutting, earth-moving, excavation and post-construction activities);
- surrounding natural heritage features or areas, and potential impacts to those;

- other features as requested through the EIS pre-consultation;
- a site plan (if appropriate) showing:
 - the proposed building envelope(s);
 - septic areas and/or proposed stormwater management (if required);
 - proposed infrastructure such as driveways, roads or parking lots.

While the mapping and main discussion should focus on the recommended or preferred plan, the EIS should also include discussion of alternative forms that the development might take.

The impact assessment should describe the significance of any negative or positive effects, both short and long-term, as well as on site and off site. The assessment should discuss:

- direct on-site effects (*i.e.*, direct loss of feature or habitat);
- description of the nature, extent and duration of potential impacts to the site, adjacent lands and potential cumulative effects;
- impacts on areas targeted as the Kincardine Terrestrial Natural Heritage System, including ecological linkages and corridors;
- effects on surface drainage systems (such as ponding, erosion, changes in volume of surface runoff, changes in water quality, timing and intensity of surface flow, associated impacts to natural features and functions, pre- to post-development water balance changes);
- effects on groundwater (such as reduced surface water recharge to groundwater, changes in
 - groundwater contribution to natural features, impedance of groundwater movement, impacts to groundwater discharge areas, construction-related impacts to aquifer integrity, groundwater contamination, and redirection of groundwater flow);
- effects on the aquatic and fish habitats;
- effects on adjacent areas, including transported effects such as sedimentation;
- effects on the key characteristics of the natural area including loss of habitat, change in
 - habitat, edge effects and impacts to sensitive species or communities;
 - effects on local connectivity, and fragmentation and isolation of habitat;
 - effects of occupancy (*i.e.*, increased disturbance and indirect impact from increased access,
- pets, lighting, noise, encroachment, etc.).
- effects on the use of the natural heritage feature, function, or area by people (e.g., recreational or educational uses).

Furthermore, a post-development feature-based water balance should be required for woodlots, wetlands and watercourses. The post-development scenario should be compared to the existing condition and mitigation measures will be required in order to maintain existing flow regimes on a monthly basis for both groundwater and surface water.

An explanation of the methods used to determine the effects on the environment must be included.

4.4.5 PROPOSED IMPACT AVOIDANCE, ENHANCEMENT & MITIGATION MEASURES

The avoidance of negative impacts on natural heritage should always be selected over an enhancement or mitigation measure where possible. Measures to enhance the natural heritage feature or function should also be explored. Ways of avoiding negative impacts for both the proposed development, and the identified alternatives to the proposal, must be listed and evaluated. Where negative impacts are unavoidable, a range of mitigating measures to reduce or minimize impacts should be evaluated. In some cases, opportunities for enhancement can be identified even in the absence of related impacts.

The report should include, but is not limited to:

- a description of the municipal requirements, standards, such as setbacks that will effect the development proposal and could impact the ability to maintain appropriate buffers, etc.;
- a preliminary grading plan indicating both existing and proposed grades for services and building envelopes that demonstrates grading can be accommodated without impacts to natural features;
- an evaluation of as many feasible mitigating measures as possible;
- a detailed description of the proposed mitigating measures, and their anticipated benefit;
- the extent of any remaining impacts discussed.
- Identification of opportunities for the enhancement of the natural heritage feature, function, or area resulting from positive effects.

4.4.6 RECOMMENDATIONS & CONCLUSIONS

The EIS report will describe preferred methods or measures to avoid or mitigate any negative impacts, and suggest positive changes and enhancements to the natural heritage of the Municipality of Kincardine. The recommendations must also state the preferred alternative proposal and discuss why it is the best alternative. Modifications to the original proposal to achieve the preferred mitigating measures and enhancement should be outlined. Such modifications include:

- modification to the concept plan or site plan
- construction requirement or constraint
- an integral component of detailed designs or site plans, such as surface water/stormwater management plan, erosion control plan, tree protection plan, rehabilitation/landscape management plan, or wildlife management plan
- appropriate buffers/setbacks
- • other environmental protection measures.

The EIS report will reach a conclusion on the significance of impacts of the proposal, and the alternative proposal, with and without the implementation of the proposed mitigation measures.

It may be determined at the EIS pre-consultation that a monitoring plan may be needed to measure the applicant's compliance to implement mitigating measures, and the adequacy of the mitigation measures. If a monitoring plan is requested, the applicant must include an outline of how the mitigating measure will be monitored.

4.4.7 APPENDICES

Appendices attached to the back of the report should include:

- literature cited and people contacted during the study, or referenced in the report
- qualifications of study team members
- all background data
- a copy of the study Terms of Reference or letter to the applicant from the County / Municipal planner which summarizes the scope of the EIS

4.4.8 MONITORING REQUIREMENTS

Monitoring enables planning agencies, through development agreements, to require subsequent changes to site conditions if the environmental effects are found to exceed predicted effects or targets, or if there are identifiable negative effects that were not anticipated or mitigated for.

Where mitigation is achieved through avoidance of negative impacts, a simplified monitoring plan to ascertain the success of the project is all that may be required. In these situations, the predicted net effects after mitigation may be negligible, and only the assumptions need to be tested. However, where mitigation is achieved by methods or measures to minimize but not to eliminate environmental effects, the predicted net effects after mitigation will be described and a monitoring plan designed to measure those effects may be required.

The Natural Heritage Reference Manual produced by the Ministry of Natural Resources (OMNR 1999) states that monitoring may be required where: (1) the large scale of a development or the sensitivity of the key functions are such that effects may be difficult to predict and/or are relatively untested or unproven in the field; (2) the mitigation technology proposed is not proven in Ontario; or (3) there are some long-term operations associated with a development that could facilitate some future or ongoing refinement to the mitigation strategy.

Depending on specific circumstances, monitoring may be required in pre-construction, construction/operation and post construction periods. Details of the monitoring program will be specific to the development proposal and will be determined through the review of the development application and the EIS.

4.4.9 OTHER RESOURCES RELATED TO EIS

- Ecological Land Classification for Southern Ontario: First Approximation and Its Application, Ontario Ministry of Natural Resources, September 1998.
- 2005 Provincial Policy Statement
- Natural Heritage Reference Manual, For Policy 2.3 of the Provincial Policy Statement, Ontario Ministry of Natural Resources, June 1999.
- Significant Wildlife Habitat Technical Guidelines, OMNR 2000
- The Municipality of Kincardine and county of Bruce Official Plans
- Manual of Implementation Guidelines for the Wetlands Policy Statement, Ontario Ministry of Natural Resources/Ontario Ministry of Municipal Affairs, November 1992
- Municipality of Kincardine Natural Heritage Strategy (*to include criteria when finalized*)

5.0 DRAFT TREE RETENTION PLAN GUIDELINES

These guidelines are intended for sites outside the Natural Heritage System (NHS) with trees on them, as well as areas within the NHS and particularly within the Lakeshore Coastal Corridor where development may be permitted in some locations subject to a tree preservation plan. These guidelines have drawn on draft tree preservation guidelines developed for the Town of New Tecumseth and the City of Guelph, with input from the study team.

Rationale

In addition to contributing to the sustainability and functioning of the NHS, the maintenance of mature tree cover is recognized as contributing to human health and quality of life. Trees are also an important element of the Municipality's natural and cultural landscape because they:

- have aesthetic value;
- reduce airborne pollution;
- maintain and enhance water quality;
- prevent soil (including sand) erosion and water run-off;
- provide habitat for wildlife;
- provide cooler temperatures in the summer; and
- mitigate the effects of global warming.

It is also recognized that it is usually more effective and sustainable to preserve existing trees on site, particularly mature trees, than to replace them post-development.

Guiding Principle

We recommend adopting the target of “no net loss” for trees whereby preservation of existing trees is always the best option, but recognizing where this is not possible that the objective should be to replace the lost tree cover by replanting trees (at a 1:1, 2:1 or 3:1 ratio depending on the size of the trees being removed) somewhere on site or in an identified restoration area elsewhere within Kincardine. Given the lakeshore's unique ecological significance, even in areas that are to be developed preservation of maximal tree cover within this zone will help support the sustainability of adjacent natural heritage features by helping to control erosion and providing some habitat for local flora and fauna, as well as migratory birds.

Information Required and Analysis

Existing tree cover assessments must:

- describe and map any woodlands (0.5 ha and greater) on site using the Ecological Land Classification (ELC) system for southern Ontario (Lee et al. 1998) to Vegetation Type;
- describe any map hedgerows and isolated tree groupings;
- identify all isolated trees on site of at least 10 cm dbh;
- for trees proposed to be removed, they must be identified to species, measured (dbh), assessed in terms of their condition, and tagged;
- describe and, where appropriate, map current or past management practices (e.g., logging, plantation),
- map the actual drip lines of all individual trees, groups of trees and woodlands;

- specifically mention, describe and locate (using UTM coordinates) heritage trees (i.e., 100 years or older) and trees that are federally or provincially designated Species at Risk (SAR);
- identify linkages to natural habitat in adjacent lands.

Additional features that should be identified, as required, in relation to the trees include:

- soils, topography, drainage, surface and ground water
- other vegetation adjacent to the site that may be impacted
- areas regulated by the Saugeen Valley Conservation Authority

The analysis of inventory data should include:

- an evaluation of the development information (preliminary layout of servicing, blocks, lots and streets; proposed land use designations; proposed grading) in relation to the information collected by way of the detailed inventory to assess the potential of vegetation retention;
- changes in drainage patterns, edge disturbance, sun scorch, wind throw, grading, etc.;
- indicate/specify measures that could reduce the need for vegetation removal; and
- actions required to control the spread of invasive species that may be a threat to the health and diversity of remaining vegetation.

Tree Preservation Plans

Tree preservation plans should:

- include mitigating measures proposed to eliminate or reduce the anticipated impacts of construction (e.g., timing restrictions, design techniques, buffers, sediment control fencing, tree hoarding, edge or buffer plantings, etc.)
- include plans indicating the design details and specifications indicating the location, type and duration of tree protection measures (e.g., erosion and sediment control through hoarding, silt fencing, etc.);
 - identify Tree Protection Zones (TPZ) around all wooded features to be retained that are to remain undisturbed throughout the construction works on the site, including final landscaping and not be sodded;
- use trees and plants for landscaping from an Approved Tree Species List (to be developed) that excludes Norway Maple (*Acer platanoides*) trees and their cultivars, as well as other known invasive exotics.

Tree Protection

In order to minimize or eliminate the negative impacts from construction activity, tree preservation plans should outline measures to be taken before, during and after construction to prevent damage to vegetation and encourage optimal tree health. These measures should include, but may not be limited to:

- prior to site works taking place install either orange snow fence or paige wire farm fencing tree hoarding (min. 1200mm high) a minimum of 1 m beyond the drip line of trees, hedgerows or wooded areas;
- trees and shrubs on abutting lands must be protected prior to works taking place;

- clearly visible information signs shall be placed on the hording indicating to identify tree protection zones and that no storage or disposal shall occur within them;
- trees identified for retention that have died or have been damaged beyond repair, shall be removed and replaced by the owner at their own expense, with trees of equal size and species;
- watering and pruning specifications and schedule for all trees to be retained and protected;
- verification that all of the recommended tree protection measures have been installed prior to any rough grading taking place on site.

Compensation and/or Mitigation

Compensation plans should ensure no net loss. This can be achieved by:

- requiring new plantings to equal the diameter of the trees to be removed (i.e., removal of a 360 mm dbh deciduous tree will necessitate the planting of six 60 mm dbh deciduous trees)
- requiring minimum acceptable sizes for plant materials (e.g., deciduous trees 60mm caliper, coniferous trees 1500m height)
- Additional requirements that will support the long-term survival of planted materials include:
 - a minimum of 100mm of shredded pine-bark mulch or equivalent mulch on all planting beds
 - no planting permitted within a drainage swale
 - the spacing of plant material should account for the ultimate size and form of the selected species

For larger developments, there should also be a requirement for compensation for trees being removed that cannot be replaced on site, such as an appropriate financial contribution to a municipal “tree fund” or a commitment to cover the cost of reforestation identified restoration areas elsewhere in the Municipality. Appropriate compensation could be determined based on the Council of Tree and Landscape Appraisers Trunk Formula Methods.

Mitigation assumes no net loss and options include:

- aeration of the soil around the trees
- root feeding
- trimming and pruning of branches
- root pruning and trimming
- relocation/transplant (in some cases it may be possible to transplant existing trees on site but this will not generally be considered viable for trees greater than 10 cm DBH or for trees in poor health, and must have regard for time of year, weather conditions, and appropriate transplanting methods and follow-up care).

All plans should adopt the principles of “tree friendly zoning and engineering”. These principles are based on consideration for the area, both above and below ground, where the trees will be either preserved or planted, and an understanding of the type of growth expected for the planted or protected trees. Key considerations include:

- providing adequate soil volume and good quality soil for proper root growth;
- providing adequate setback requirements from above and below ground utilities and driveways.
- providing adequate setback requirements from proposed buildings, structures, light standards and overhead utilities.

Notes on Process

The tree preservation review process should be undertaken in tandem with the review of preliminary site layout, servicing and grading plans in order to be effective. In addition, in most cases the final plan should be completed by a recognized professional in tree management (e.g., a Certified Arborist) and all tree work on site should be done under their supervision.

6.0 CONCLUDING REMARKS

This Volume 2 report builds on the Volume 1 report (Existing Conditions, Scientific Methodology and Preliminary Natural Heritage System) developed for the Municipality of Kincardine by providing an overview of currently applicable natural heritage policy, and providing recommendations with respect to updating Municipal natural heritage policy to make it consistent with the principles and criteria established for the preliminary NHS. This report also provides specific policy and technical recommendations for effective implementation of the NHS vision and criteria established in Volume 1.

However, this report should be considered a resource and basis for discussion rather than a pronouncement of final policy direction for the Municipality. Volume 2 has been developed by the consulting team with general input from the Study Steering Committee and with consideration for some of the input received from the Science Committee and Stakeholders' Group, but has not been specifically reviewed by the Science Committee or the Stakeholders' Group. In order to move this study towards more concrete policy updates, further discussion among the key Municipal and County staff and the SVCA, and broader discussion with a representative range of stakeholders in the Municipality of Kincardine is warranted.

7.0 GLOSSARY OF KEY TERMS

ANSI = Areas of Natural and Scientific Interest
BNPD = Bruce Nuclear Power Development site
COSEWIC = Committee on the Status of Endangered Wildlife in Canada
COSSARO = Committee on the Status of Species at Risk in Ontario
CVC = Credit Valley Conservation Authority
Dbh = Diameter at breast height (for trees)
ELC = Ecological Land Classification
ESA = Environmentally Sensitive Area
GIS = Geographic Information System
GRCA = Grand River Conservation Authority
LSNA = Locally Significant Natural Area
LSW = Locally Significant Wetland
NHIC = Natural Heritage Information Center
NHS = Natural Heritage System
OBBA = Ontario Breeding Bird Atlas
OMB = Ontario Municipal Board
OMNR = Ontario Ministry of Natural Resources
PSW = Provincially Significant Wetland
SAR = Species at Risk
SVCA = Saugeen Valley Conservation Authority
TRCA = Toronto Region Conservation Authority

Species at Risk (SAR) Definitions from COSEWIC (Canada) and COSSARO (Ontario)

- **Threatened (THR):** A wildlife species likely to become endangered if limiting factors are not reversed.
- **Endangered (END):** A wildlife species facing imminent extirpation or extinction.
- **Special Concern (SC):** A wildlife species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats.
- **Extirpated (XT):** A wildlife species no longer existing in the wild in Canada, but occurring elsewhere.
- **Extinct (X):** A wildlife species that no longer exists.
- **Data Deficient (DD):** A wildlife species for which there is inadequate information to make a direct, or indirect, assessment of its risk of extinction.
- **Not At Risk (NAR):** A wildlife species that has been evaluated and found to be not at risk of extinction given the current circumstances.

Natural Heritage Information Centre (NHIC) Ranking Definitions (OMNR)

Provincial (or Subnational) ranks are used by the Natural Heritage Information Centre to set protection priorities for rare species and natural communities. These ranks are not legal designations. Provincial ranks are assigned in a manner similar to that described for global ranks, but consider only those factors within the political boundaries of Ontario. By comparing the global and provincial ranks, the status, rarity, and the urgency of conservation, needs can be ascertained.

The NHIC evaluates provincial ranks on a continual basis and produces updated lists at least annually. The NHIC welcomes information which will assist in assigning accurate provincial ranks.

- **S1: Critically Imperiled** - Critically imperiled in the nation or state/province because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the state/province.
- **S2: Imperiled** - Imperiled in the nation or state/province because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the nation or state/province.
- **S3: Vulnerable** - Vulnerable in the nation or state/province due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.
- **S4: Apparently Secure** - Uncommon but not rare; some cause for long-term concern due to declines or other factors.
- **S5: Secure** - Common, widespread, and abundant in the nation or state/province.
- **SX: Presumed Extirpated** - Species or community is believed to be extirpated from the nation or state/province. Not located despite intensive searches of historical sites and other appropriate habitat, and virtually no likelihood that it will be rediscovered.
- **SH: Possibly Extirpated (Historical)** - Species or community occurred historically in the nation or state/province, and there is some possibility that it may be rediscovered. Its presence may not have been verified in the past 20-40 years.
- **SNR: Unranked** - Nation or state/province conservation status not yet assessed.
- **SU: Unrankable** - Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.
- **SNA: Not Applicable** - A conservation status rank is not applicable because the species is not a suitable target for conservation activities.
- **S#S#: Range Rank** - A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species or community. Ranges cannot skip more than one rank (e.g., SU is used rather than S1S4).

Areas of Natural and Scientific Interest (ANSIs)

Areas of land and water containing natural landscapes or features which the Ministry of Natural Resources has identified as having provincial significance, possessing values related to natural heritage appreciation, scientific study or education:

- ***Life Science*** Areas of Natural and Scientific Interest are those areas identified by the Ministry of natural Resources for their high quality representation of important provincial biotic attributes.
- ***Earth Science*** Areas of Natural and Scientific Interest are those areas identified by the Ministry of Natural Resources for their high quality representation of important provincial geological attributes.

Environmentally Significant Areas (ESAs)

Places where ecosystem functions or features warrant special protection. These may include but are not limited to rare or unique plant or animal populations or habitats, plant or animal communities, or concentrations of ecological functions. In the Municipality of Kincardine, a number of ESAs were identified through a study conducted in the southern portion of the County of Bruce by the Saugeen Valley Field Naturalists (Hilts and Parker 1980), but these have never been designated through Municipal or County Official Plans.

Wetlands

For the purpose of this study wetlands includes only those wetlands that would be defined as a wetland if evaluated using the Provincial Wetland Evaluation System. Unevaluated wetlands may be subject to evaluation in the future and a determination made that these features are wetlands in accordance with the Provincial Wetland Evaluation System - Southern Manual.

Wetlands are defined in the PPS as: *“means lands that are seasonally or permanently covered by shallow water, as well as lands where the water table is close to or at the surface. In either case the presence of abundant water has caused the formation of hydric soils and has favoured the dominance of either hydrophytic plants or water tolerant plants. The four major types of wetlands are swamps, marshes, bogs and fens. Periodically soaked or wet lands being used for agricultural purposes which no longer exhibit wetland characteristics are not considered to be wetlands for the purposes of this definition.”*

Watercourses

The definition of a watercourse will be as defined in the *Conservation Authorities Act* “an identifiable depression in the ground in which a flow of water regularly or continuously occurs.” For the purpose of this study, the limits of any watercourse so defined will be determined using the meander belt width as defined by the relevant conservation authorities.

Surface Water Features

This includes lakes, woodland ponds, watercourses, springs, seeps, reservoirs, *etc.* which provide ecological functions. It is not intended to include small surface water features such as farm ponds or stormwater management ponds, which would have limited ecological function. Some judgment will have to be exercised when assessing eligibility of features for the application of this criterion.

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